
Annize

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TODO Anise is a Python-based execution engine for automation tasks. Automation tasks exist in software development and probably all kinds of other sectors. They typically require the execution of different smaller and larger tools. Complex tasks often need a sequence of many steps to execute, with some steps having dependencies to each other. Manually triggering all these steps in the graphical interfaces of all the involved tools is possible in theory, but will generate errors and frustration after some cycles. The automation interfaces of those tools are sometimes easier, but sometimes they are error-prone. Some tasks may also need to ask the user for some information in an interactive way. Some smaller parts might also be machine-specific (e.g. filesystem paths or the code how to access a password vault), while the entire task must be runnable on some different machines. In some situations, this can lead to a rather intransparent forest of different tools, with unique oddnesses and special conventions. As the number of different project increases, you will see more and more different tools, often doing a similar job, but for different platforms or frameworks and, of course, with different usage conventions. Spontaneously written glue scripts help in the beginning, but will explode as the complexity exceeds some threshold. Typical tasks in software development could be:

- Generating documentation- Testing- Automatic code generation- Creating packages- Creating a homepage, automatically built from the available version information, the packages, the documentation and so on- Deploying this homepage to a web server- Handling version information - e.g. print it in the manual- and many moreThe Anise framework allows you to implement all those tasks in a structured but generic way in a combination of XML and Python code. Once you have created this stuff at a defined place in your project, Anise lets you easily execute your tasks from command line (or from any editor if you embed it somehow). This gives you a common and easy interface to all your 'tool glue' code.The Anise engine executes arbitrary Python sourcecode and provides some additional services like logging, parameter passing from command line, basic graphical userinterface support, a plugin interface, a flexible event system, injecting code and data from other place,dependencies between code fragments, and more.On top of this engine, Anise comes with a bunch of implementations that fulfill tasks (or parts of them) of software development. There is a testing module, a documentation- and homepage-generator, some package building methods and a lot more. The implementations use the event system in many places in order to allow customization in a somewhat technical but very flexible way. Even so, those implementations are rather specific and it depends on the particular case, if, and how many of those implementations are useful.

LICENSE

Annize is distributed under the terms of the AGPL 3 license. This also affects all included files without a license header (non-source files like images), unless they are explicitly mentioned as third-party content. Read the ‘Dependencies’ section for included third-party stuff.

UP-TO-DATE?

Are you currently reading from another source than the homepage? If you are in doubt whether your package is up-to-date, you should visit the project homepage and check that.

DEPENDENCIES

Annize makes use of some third-party parts.



Required: **Python 3.13**



Required: **Python package hallyd** `~= 0.9003`



Required: **Python package klovve[graphical]** `~= 1.6`



Required: **Python package lxml** `~= 6.0`



Required: **Python package pycountry** `~= 24.6`



Required: **Python package pyperclip** `~= 1.11`



Recommended: **GNU/Linux**



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USER MANUAL

4.1 First Steps

4.1.1 Installation

Visit the Annize homepage to find the installation package that best suits your environment. The homepage offers various options depending on your system and preferences. Then install this package.

The simplest way to install Annize may be through `pip`, Python's package manager. For that way, prepare your `pip` environment at first (typically incl. a `venv`) and then run `pip install annize`.

After installation, you should be able to run Annize. To confirm that Annize is installed correctly, simply run `annize --help`.

4.1.2 The First Annize Project

In the following we will set up a first Annize projects in order to show the steps along the way. For that, we need to implement data structures and logic that we can use in Annize projects. Then we create a new Annize project, set up our functionality there, and finally execute it.

Preparing An Annize Feature

In Annize, all functionality is provided through **Features**. A Feature is a Python submodule within the `annize.features` namespace, which implements specific functionality that an Annize project can reference.

Annize itself primarily serves as the execution engine and does not include many built-in Features. Features can either be implemented manually or installed from additional packages (such as `Annize-pidev`, which provides Features used in Annize's own project).

To create a new Feature, a Python package must be added under the `annize.features` namespace. For example, to create a simple `hello_world` Feature:

1. In your Python packages directory, create the `annize/features` directory.
2. Inside that directory, create a file named `hello_world.py`.
3. Open that file in your preferred Python development environment or text editor.

At first we define a simple data structure:

```
class MyData:

    def __init__(self, foo: int, bar: str):
        self.foo = foo
        self.bar = bar
```

Then we define a task that we can execute (typically putting the `import` lines at the front of the file):

```
import annize.flow.run_context
import annize.user_feedback

class MyTask:

    def __init__(self, foo: int):
        self.foo = foo

    def __call__(self):
        # get all MyData objects defined in the project ...
        my_datas = annize.flow.run_context.objects_by_type(MyData)
        # and for all of them ...
        for my_data in my_datas:
            # if their 'foo' matches the task's one ...
            if my_data.foo == self.foo:
                # tell the user
                annize.user_feedback.message_dialog(my_data.bar, ["OK"])
```

This task would, once executed, collect all `MyData` objects, and show a message to the user for each one that has the 'right' `foo` value. Real Features would not interact with the user very often, but usually just do some real work.

Optionally, we can write Python 'docstrings' for both classes, including Sphinx-based parameter documentation for the constructor.

Creating A New Annize Project

With the functionality implemented, you can now create an Annize project and start using the Features you have defined.

1. Create an empty directory: Start by creating a new empty directory for your Annize project, e.g. somewhere in your home directory.
2. Launch Annize: Open Annize either from the start menu or by running `annize` from the command line.
3. Create a new project: In the Annize interface, create a new project and select the empty directory as the project location.
4. Expand the `project.xml` box.
5. Create a `MyData` object: Create a new `MyData` object inside the `project.xml` box. Assign some values to the `foo` and `bar` properties.
6. Create a `MyTask` object: Add a `MyTask` object to the `project.xml` box and assign a `foo` value.
7. Name the `MyTask`: Assign a name to the `MyTask` object.
8. Save the project: Once the setup is complete, save the project.

Executing The Annize Project

To execute the project, click the play button. A chooser will appear, displaying the name assigned to the `MyTask` object earlier. Select that task to begin execution.

Depending on the values assigned earlier, the execution will either complete immediately or display messages to the user during execution.

You can also create additional `MyTask` objects with different values and names, as well as add more `MyData` objects to the project.

What we have covered so far represents the basic functionality of Annize. With this foundation, you can already start building a variety of projects. The following sections will delve into more advanced details and features.

4.2 Annize Projects

An Annize **project** consists of object definitions that refer to available Annize Features. Some of these objects are typically executable tasks, which can be started during Annize execution.

The configuration files for an Annize project are stored in the `-meta` subdirectory of a project root directory. Some alternative names are allowed, but uncommon. At a minimum, this subdirectory will contain a `project.xml` file.

In addition to `project.xml`, it is possible to add more `project.*.xml` files. The structure of these files is flexible; Annize does not impose restrictions on where or how different objects are defined.

All objects within the project can be assigned names, and these names can be referenced throughout the project wherever needed.

Further details on the project structure are beyond this overview.

4.3 Annize Studio

The Annize **Studio** is what you see when you run `annize` (like you did in the ‘First Steps’).

The Annize Studio provides a comprehensive environment for configuring and managing Annize projects. Through this interface, you can:

- Add, remove, or modify objects: Easily configure your project by adding new objects, removing unnecessary ones, or editing existing configurations, including references to other objects and more.
- Identify configuration issues: The interface highlights problems with the current project setup, helping you quickly identify and resolve issues.
- Access Feature documentation: View documentation for the available Features directly within the interface, providing useful context and guidance as you build your project.
- Start project execution: Once your project is configured, you can initiate execution from the interface, allowing for quick testing and iteration.

4.4 Annize Programming Interface

There are several advanced topics related to the Annize API that are recommended for further reading:

- [`annize.fs`](#) and [`annize.features.files.common`](#).
- [`annize.features.base`](#).
- [`annize.features.task`](#).
- [`annize.i18n`](#) and [`annize.features.i18n.common`](#).
- [`annize.user_feedback`](#).

COMMAND LINE INTERFACE REFERENCE

```
usage: annize [-h] [--project PROJECT]
              [--with-answers-from-json-file WITH_ANSWERS_FROM_JSON_FILE]
              [--with-answers-from-json-string WITH_ANSWERS_FROM_JSON_STRING]
              [--with-answer WITH_ANSWER WITH_ANSWER]
              [command] ...
```

5.1 Positional Arguments

[command] Possible choices: do
 The command to execute.

5.2 Named Arguments

--project Project directory or Annize configuration file (otherwise: the current working directory). Annize will automatically try to find it in parent directories as well.

--with-answers-from-json-file Automate particular user feedback questions with given answers from a JSON file.
Default: []

--with-answers-from-json-string Automate particular user feedback questions with given answers from a JSON string.
Default: []

--with-answer Automate a particular user feedback question with a given answer.
Default: []

5.3 Sub-commands

5.3.1 do

Execute a task.

```
annize do [-h] [task_name]
```

Positional Arguments

task_name	Task name.
	Default: ''

API REFERENCE

6.1 annize namespace

6.1.1 Subpackages

annize.asset package

Submodules

annize.asset.data module

`annize.asset.data.readme_pdf(culture)`

Parameters

culture (*str*)

Return type

Path

annize.asset.project_info module

annize.data package

Annize data structures.

Submodules

annize.data.color module

class `annize.data.color.Color`(* (*Keyword-only parameters separator (PEP 3102)*), *red*, *green*, *blue*)

Bases: `object`

A color.

Parameters

- **red** (*float*) – The color’s red component. A value between 0 and 1.
- **green** (*float*) – The color’s green component. A value between 0 and 1.
- **blue** (*float*) – The color’s blue component. A value between 0 and 1.

property red: `float`

The color’s red component. A value between 0 and 1.

This is a component of the RGB color space, as *green* and *blue*. There are other color spaces supported as well.

property green: float

The color's green component. A value between 0 and 1.

This is a component of the RGB color space, as [red](#) and [blue](#). There are other color spaces supported as well.

property blue: float

The color's blue component. A value between 0 and 1.

This is a component of the RGB color space, as [red](#) and [green](#). There are other color spaces supported as well.

property hue: float

The color's hue component. A value between 0 and 1.

This is a component of the HLS color space, as [lightness](#) and [saturation](#). There are other color spaces supported as well.

property lightness: float

The color's hue component. A value between 0 and 1.

This is a component of the HLS color space, as [hue](#) and [saturation](#). There are other color spaces supported as well.

property saturation: float

The color's hue component. A value between 0 and 1.

This is a component of the HLS color space, as [hue](#) and [lightness](#). There are other color spaces supported as well.

with_modified(*, red=None, green=None, blue=None, hue=None, lightness=None, saturation=None)

Return a color with some components set to new values.

Parameters

- **red** (*float* | *None*) – See [red](#).
- **green** (*float* | *None*) – See [green](#).
- **blue** (*float* | *None*) – See [blue](#).
- **hue** (*float* | *None*) – See [hue](#).
- **lightness** (*float* | *None*) – See [lightness](#).
- **saturation** (*float* | *None*) – See [saturation](#).

Return type

[Color](#)

property html_color_spec: str

The HTML color specification of this color.

__get_normed_value(value_2)**Parameters**

- **value_1** (*float* | *None*)
- **value_2** (*float*)

Return type

float

```
__html_color_spec__part()
```

Parameters

part_value (*int*)

Return type

str

annize.data.container module

```
class annize.data.container.Basket(*args, **kwargs)
```

Bases: list

annize.data.version module

Version numbers. See [Version](#).

```
class annize.data.version.Version(*, text=None, pattern, **segment_values)
```

Bases: object

A version number. It has a [text](#) (and a [pattern](#)), but also its [segments_tuples](#).

Parameters

- **text** (*str* / *None*) – The textual representation of the version number. If set, [segments_tuples](#) will be derived from it.
- **pattern** ([VersionPattern](#)) – The version pattern behind the textual representation of the version number.
- **segment_values** (*Any*) – Segment values that define this version number. Well known names are "major", "minor" and "build". This is an alternative to text. Values are often of type int.

property segments_tuples: Sequence[_SegmentTuple]

This version number's segment tuples. Each tuple contains the segment name (well known ones are "major", "minor" and "build") and the value. The value is usually an int, but it could also be a str or anything else that is comparable.

If this version number was constructed with a text, segment tuples are derived from it (using [pattern](#)). If not, segment tuples come from the [segment_values](#) specified during construction.

property segments_values: dict[str, Any]

Like [segments_tuples](#), but as a dictionary.

property text: str

The textual representation of this version.

property pattern: [VersionPattern](#)

The version pattern.

```
class annize.data.version.VersionPattern(*, parts)
```

Bases: object

A version pattern. Mostly used for translation between the textual representation and the segment tuples of a [Version](#).

Parameters

parts (*Iterable*[[VersionPatternPart](#)]) – The pattern parts.

property parts: Sequence[VersionPatternPart]

The pattern parts.

property segment_names

The pattern segment names.

text_to_segments_tuples(text)

Extract and return segment tuples from a given text.

Parameters

text (str) – The text to extract.

Return type

Sequence[_SegmentTuple]

segments_tuples_to_text(segments_tuples)

Return a textual representation for the given segment tuples.

Parameters

segments_tuples (Iterable[_SegmentTuple]) – The segment tuples.

Return type

str

class annize.data.version.VersionPatternPart

Bases: ABC

A part of a [VersionPattern](#). This can span the entire version pattern, or just one segment of it, or anything between.

abstract property segment_names: Sequence[str]

Names of all segments of this pattern part.

abstract property regexp_string: str

Return a regexp for this pattern part.

abstractmethod segments_tuples_to_text(segments_tuples)

Return a textual representation for the given segment tuples.

Parameters

segments_tuples (Sequence[_SegmentTuple]) – The segment tuples.

Return type

str

abstractmethod str_to_value(segment_name, s)

Return a value of the correct type (often int) for a given text representation of a segment.

Parameters

- **segment_name** (str) – The segment name.
- **s** (str) – The text to convert.

Return type

Any

_abc_impl = <_abc._abc_data object>

```
class annize.data.version.NumericVersionPatternPart(*, name)
```

Bases: [VersionPatternPart](#)

A version pattern part that represents one numeric segment of a version number.

Parameters

name (*str*) – The segment name.

property `segment_names`

Names of all segments of this pattern part.

property `regexp_string`

Return a regexp for this pattern part.

segments_tuples_to_text(*segments_tuples*)

Return a textual representation for the given segment tuples.

Parameters

segments_tuples – The segment tuples.

str_to_value(*segment_name*, *s*)

Return a value of the correct type (often `int`) for a given text representation of a segment.

Parameters

- **segment_name** – The segment name.
- **s** – The text to convert.

`_abc_impl = <_abc._abc_data object>`

```
class annize.data.version.SeparatorVersionPatternPart(*, text)
```

Bases: [VersionPatternPart](#)

A version pattern part that represents a separator in a version number.

Parameters

text (*str*) – The separator text.

property `segment_names`

Names of all segments of this pattern part.

property `regexp_string`

Return a regexp for this pattern part.

segments_tuples_to_text(*segments_tuples*)

Return a textual representation for the given segment tuples.

Parameters

segments_tuples – The segment tuples.

str_to_value(*segment_name*, *s*)

Return a value of the correct type (often `int`) for a given text representation of a segment.

Parameters

- **segment_name** – The segment name.
- **s** – The text to convert.

`_abc_impl = <_abc._abc_data object>`

```
class annize.data.version.OptionalVersionPatternPart(*, parts)
```

Bases: [VersionPatternPart](#)

A version pattern part that represents an optional part of a version number.

Parameters

parts (*Iterable*[[VersionPatternPart](#)]) – The inner parts.

property segment_names

Names of all segments of this pattern part.

property regexp_string

Return a regexp for this pattern part.

segments_tuples_to_text(*segments_tuples*)

Return a textual representation for the given segment tuples.

Parameters

segments_tuples – The segment tuples.

str_to_value(*segment_name*, *s*)

Return a value of the correct type (often `int`) for a given text representation of a segment.

Parameters

- **segment_name** – The segment name.
- **s** – The text to convert.

_abc_impl = `<_abc._abc_data object>`

```
class annize.data.version.ConcatenatedVersionPatternPart(*, parts)
```

Bases: [VersionPatternPart](#)

A version pattern part that represents the concatenation of other parts.

Parameters

parts (*Iterable*[[VersionPatternPart](#)])

property segment_names

Names of all segments of this pattern part.

property regexp_string

Return a regexp for this pattern part.

segments_tuples_to_text(*segments_tuples*)

Return a textual representation for the given segment tuples.

Parameters

segments_tuples – The segment tuples.

str_to_value(*segment_name*, *s*)

Return a value of the correct type (often `int`) for a given text representation of a segment.

Parameters

- **segment_name** – The segment name.
- **s** – The text to convert.

_abc_impl = `<_abc._abc_data object>`

annize.features namespace

Subpackages

annize.features.files namespace

Submodules

annize.features.files.common module

Files and directories.

class annize.features.files.common.**FsEntry**(*, path, root)

Bases: *FilesystemContent*

A filesystem location, either relative to the Annize project root directory or another root.

If it is already known whether the entry is a file or a directory, consider using *File* or *Directory* instead. Special files (e.g. symlinks) can also be represented by a *File*.

Parameters

- **path** (*str* | *Path* | *None*) – The path that points to the referenced content (relative to root).
- **root** (*str* | *Path* | *FilesystemContent* | *None*) – The root directory. If unset, it is the Annize project root directory.

property root: *FilesystemContent*

The root directory.

relative_path is considered to be relative to this one.

property relative_path: *Path*

The path that points to the referenced content (relative to *root*).

_path()

class annize.features.files.common.**File**(*, path, root)

Bases: *FsEntry*

A file location, either relative to the Annize project root directory or another root.

Parameters

- **path** (*str* | *Path* | *None*) – The path that points to the referenced content (relative to root).
- **root** (*str* | *Path* | *FilesystemContent* | *None*) – The root directory. If unset, it is the Annize project root directory.

class annize.features.files.common.**Exclude**(*, by_path_pattern, by_path, by_name_pattern, by_name)

Bases: object

An exclusion definition. Usually used with *Directory* and *DirectoryPart*.

Parameters

- **by_path_pattern** (*str* | *None*) – Exclude by this regexp pattern on the full path.
- **by_path** (*str* | *None*) – Exclude this path.
- **by_name_pattern** (*str* | *None*) – Exclude by this regexp pattern on the file name.
- **by_name** (*str* | *None*) – Exclude this file name.

`__does_exclude(by_text, by_pattern)`

Parameters

- **text** (*str*)
- **by_text** (*str*)
- **by_pattern** (*Pattern*)

Return type

bool

`does_exclude(relative_path, source, destination)`

Return whether a given location is excluded by this exclusion definition.

Parameters

- **relative_path** (*Path*) – The relative path to check for exclusion.
- **source** (*Path*) – The absolute source path.
- **destination** (*Path*) – The absolute destination path.

Return type

bool

`class annize.features.files.common.ExcludeAllBut(*, excludes)`

Bases: *Exclude*

A negative exclusion definition.

It will exclude an item whenever `_none_` of the given inner exclude definitions match.

Parameters

excludes (*list* [*Exclude*]) – List of inner exclude definitions.

`does_exclude(relative_path, source, destination)`

Return whether a given location is excluded by this exclusion definition.

Parameters

- **relative_path** – The relative path to check for exclusion.
- **source** – The absolute source path.
- **destination** – The absolute destination path.

`class annize.features.files.common.DirectoryPart(*, excludes, root, source_path=None, destination_path=None, path=None, destination_is_parent=False)`

Bases: *object*

A part of a directory. Used in *Directory*.

Parameters

- **excludes** (*Iterable* [*Exclude*]) – List of exclusion definitions.
- **root** (*str* | *Path* | *FileSystemContent* | *None*) – The root directory. If unset, it is the root directory specified for the owning *Directory*.
- **source_path** (*str* | *Path* | *None*) – The path that points to the referenced content (relative to root).

- **destination_path**(*str* | *Path* | *None*) – The relative destination path inside the owning *Directory*.
- **path**(*str* | *Path* | *None*) – Shorter way to set *source_path* and *destination_path* to the same path.
- **destination_is_parent**(*bool*) – Whether to consider the destination path as the parent of the new destination (instead of the new destination itself). The actual destination will have the same basename as the source then.

property excludes: *Sequence*[*Exclude*]

Exclusion definitions.

property root: *FilesystemContent* | *None*

The root directory (or *None* for the owning *Directory*.*root*).

source_path is considered to be relative to this one.

property source_path: *Path*

The path that points to the referenced content (relative to *root*).

property destination_path: *Path*

The relative destination path inside the owning *Directory*.

See also *destination_is_parent*.

property destination_is_parent: *bool*

Whether to consider the destination path as the parent of the new destination (instead of the new destination itself).

class *annize.features.files.common.Directory*(***, *path*, *root*, *excludes*, *parts*, *name*)

Bases: *FsEntry*

A directory location, either relative to the Annize project root directory or another root.

Depending on how it is configured, this might point to a dynamically generated temporary location (e.g. if it is composed of parts or excludes are specified).

Parameters

- **path**(*str* | *None*) – The path that points to the referenced directory (relative to *root*). If set, do not set *parts*!
- **root**(*str* | *Path* | *FilesystemContent* | *None*) – The root directory. If unset, it is the Annize project root directory.
- **excludes**(*Iterable*[*Exclude*]) – Exclusion specifications. If some are specified, this directory will be dynamically generated. If set, do not set *parts*!
- **parts**(*Iterable*[*DirectoryPart*]) – Directory parts. If some are specified, this directory will be dynamically generated. Also, do not set *path* or *excludes*!
- **name**(*str* | *None*) – The name that this directory shall have (instead of its original name). If specified, this directory will be dynamically generated. It must not contain directory separator characters (mostly *"/**"*).

property parts: *Sequence*[*DirectoryPart*]

property excludes: *Sequence*[*Exclude*]

_path()

__transfer_filter_for_exclude()

Parameters

exclude (*Exclude*)

Return type

annize.fs.Path.TTransferFilter

class annize.features.files.common.**ProjectDirectory**

Bases: *FilesystemContent*

The Annize project root directory.

Parameters

generate_func – The content generator function. It has no parameters and returns an absolute path to the content (usually inside some temporary directory).

_path()

class annize.features.files.common.**MachineRootDirectory**

Bases: *FilesystemContent*

The machine root directory, i.e. /.

Parameters

generate_func – The content generator function. It has no parameters and returns an absolute path to the content (usually inside some temporary directory).

_path()

annize.features.i18n namespace

Submodules

annize.features.i18n.common module

Internationalization, i.e. translation and similar tasks.

class annize.features.i18n.common.**_ProjectDefinedTranslationProvider**

Bases: *TranslationProvider*

Internally created translation provider for backing *String* instances.

translate(*string_name*, *, *culture*)

Return the translation of a given text for a given culture (or None if there is no translation for it).

Note: This does NOT obey the culture's fallbacks (see *Culture.fallback_cultures*)! That functionality is implemented in higher level parts of the API.

Parameters

- **string_name** – The string name.
- **culture** – The culture.

add_translations(*string_name*, *variants*)

Parameters

- **string_name** (*str*)
- **variants** (*dict[str, str]*)

Return type

None

`_ProjectDefinedTranslationProvider__translations_for_string_name(string_name)`**Parameters****string_name** (*str*)**Return type**

dict[str, str]

`_abc_impl = <_abc._abc_data object>``annize.features.i18n.common._translation_provider()``class annize.features.i18n.common.String(*, string_name, stringtr, **variants)`Bases: [ProvidedTrStr](#)

A translatable text defined in an Annize project.

Do not use directly. See `TrStr.tr()`.**Parameters**

- **string_name** (*str* / *None*) – The string name.
- **stringtr** (*str* / *None*)
- **variants** (*str*)

`_abc_impl = <_abc._abc_data object>``class annize.features.i18n.common.Culture(*, iso_639_1_language_code, region_code, fallback_cultures)`Bases: [Culture](#)

A culture defined in an Annize project.

Do not use directly. See e.g. `get_from_iso_639_1_lang_code()` and `culture_by_spec()`.**Parameters**

- **english_lang_name** – The language name in English.
- **iso_639_1_language_code** (*str*) – The ISO-639-1 language code, like "en".
- **region_code** (*str* / *None*) – Optional language variant region_code, like "US".
- **fallback_cultures** (*list*[[Culture](#)]) – List of fallback cultures. See `fallback_cultures`.

`class annize.features.i18n.common.ProjectCultures(*, cultures)`Bases: `list`

Definition of an Annize project's target cultures.

Parameters**cultures** (*Sequence*[[Culture](#)])`annize.features.i18n.common.project_cultures()`Return a list of the current Annize project's target cultures. See also [ProjectCultures](#).**Return type***Sequence*[[Culture](#)]

annize.features.i18n.gettext module

gettext-based internationalization.

```
class annize.features.i18n.gettext.UpdatePOs(*, po_directory)
```

Bases: object

Parameters

po_directory (*str* / *Path*) – The directory with .po files.

```
class annize.features.i18n.gettext.GenerateMOs(*, po_directory, mo_directory, file_name)
```

Bases: object

Parameters

- **po_directory** (*str* / *Path* / *FileSystemContent*)
- **mo_directory** (*str* / *Path*)
- **file_name** (*str* / *None*)

```
class annize.features.i18n.gettext.TextSource(*, mo_directory, priority=0)
```

Bases: object

Parameters

- **mo_directory** (*str* / *Path*)
- **priority** (*int*)

Submodules

annize.features.base module

Project base information.

```
class annize.features.base.Data(*, project_name=None, pretty_project_name=None, summary=None,  
                                long_description=None, homepage_url=None, imprint=None,  
                                project_directory=None)
```

Bases: object

Parameters

- **project_name** (*str*)
- **pretty_project_name** (*TrStr* / *None*)
- **summary** (*TrStr* / *None*)
- **long_description** (*TrStr* / *None*)
- **homepage_url** (*str* / *None*)
- **imprint** (*TrStr* / *None*)
- **project_directory** (*str* / *None*)

property **project_name**: *str*

property **pretty_project_name**: *TrStr*

property **summary**: *TrStr*

property **long_description**: *TrStr*

```

    property homepage_url: str

    property imprint: TrStr

    property project_directory: str

class annize.features.base.BrandColor(*, red, green, blue)
    Bases: Color

    Parameters
        • red (float) – The color’s red component. A value between 0 and 1.
        • green (float) – The color’s green component. A value between 0 and 1.
        • blue (float) – The color’s blue component. A value between 0 and 1.

class annize.features.base.DateTime(*, iso)
    Bases: datetime

    Parameters
        iso (str)

class annize.features.base.Keywords(*, from_string="", split_by=' ', keywords=())
    Bases: object

    Parameters
        • from_string (str)
        • split_by (str)
        • keywords (list[str])

    property keywords: list[str]

class annize.features.base.Keyword(text)
    Bases: Keywords

    Parameters
        text (str)

annize.features.base.project_keywords()

    Return type
        Keywords

class annize.features.base.Basket(*, items)
    Bases: Basket

    Parameters
        items (list[object])

class annize.features.base.FirstOf(*, objects)
    Bases: Basket

    Parameters
        objects (list[object])

annize.features.base.brand_color(*, none_on_undefined=False)

    Parameters
        none_on_undefined (bool)

```

Return type

[Color](#)

`annize.features.base._get_data(key, default)`

Parameters

- **key** (*str*)
- **default** (*Any*)

Return type

Any

`annize.features.base.project_name()`

Return type

str

`annize.features.base.pretty_project_name()`

Return type

[TrStr](#)

`annize.features.base.summary()`

Return type

[TrStr](#)

`annize.features.base.long_description()`

Return type

[TrStr](#)

`annize.features.base.homepage_url()`

Return type

str

`annize.features.base.imprint()`

Return type

[TrStr](#)

`annize.features.base.project_directory()`

Return type

[Path](#)

`annize.features.base.sanitized_project_name(name)`

Parameters

name (*str*)

Return type

str

`annize.features.task` module

Tasks.

```
class annize.features.task.Task(*, inner_tasks, is_advanced=False)
```

Bases: object

Parameters

- **inner_tasks** (*Sequence[Callable]*)
- **is_advanced** (*bool*)

property is_advanced: bool

annize.flow package

Execution of Annize projects.

See e.g. [annize.flow.runner.Runner](#) and [annize.flow.run_context.RunContext](#).

Submodules

annize.flow.run_context module

Run contexts. Typically used by the infrastructure in the course of the execution of an Annize project.

See also [RunContext](#) and [current\(\)](#).

```
class annize.flow.run_context.RunContext
```

Bases: object

Holds data for a single execution of an Annize project (usually happening in a [annize.flow.runner.Runner](#)).

Beyond a few fixed data, like the root path of the Annize project configuration files, it stores every object that was created by definition in the Annize project configuration. Many parts of this API (e.g. many method names) use the term ‘object’ for all data items stored in a run context.

Each of those objects has at least one name. This can be a “friendly name”, i.e. a name that was explicitly specified in the project. If no name was specified, there will at least be an dynamically generated one, so every object is uniquely addressable by name. The dynamically generated names will differ between one project execution and another one, while friendly names are stable by nature.

There are further ways to access stored data, which do not involve names. See this class’ methods.

For each object in the store, arbitrary metadata can be stored as well.

See also [current\(\)](#).

This run context needs to be entered (with-block) during project execution.

Do not use directly.

```
_IS_TOPLEVEL_OBJECT__METADATA_KEY = '__026Fb2ZQPpIj001002RgL00122M'
```

```
_NAMES__METADATA_KEY = '__026Fb2ZQPy3g002002RgL00122M'
```

```
ANNIZE_CONFIG_DIRECTORY__NAME = '__026Fb2ZQQ3Ew003002RgL00122M'
```

```
prepare(*, annize_config_directory)
```

Prepare the execution.

Needs to be called once, before the actual execution begins, in order to make some basic data available.

Parameters

annize_config_directory (*Path*) – The Annize project configuration root path.

Return type

None

object_by_name(*name*, *default=None*, *, *create_nonexistent=False*)

Return an object by one of its names (or a default value).

See also [`set_object_name\(\)`](#).**Parameters**

- **name** (*str*) – An object name.
- **default** (*Any*) – The default value to return when no object exists with the given name.
- **create_nonexistent** (*bool*) – (If the default value is going to be returned because no object existed with the given name) Whether to store the default value in the data store with the given name, so it can be found later.

Return type*Any***object_names**(*obj*)

Return all object names for a given object (with friendly names first).

This method always returns a non-empty list. Even if the given object was not stored at all yet, it automatically gets added to the store implicitly.

See also [`set_object_name\(\)`](#).**Parameters****obj** (*Any*) – The object.**Return type***Sequence*[*str*]**object_name**(*obj*)

Return one object name for a given object (preferably a friendly one).

This method always returns a valid name. Even if the given object was not stored at all yet, it automatically gets added to the store implicitly.

See also [`set_object_name\(\)`](#).**Parameters****obj** (*Any*) – The object.**Return type***str***set_object_name**(*obj*, *name*)

Assign a name to an object.

All names assigned earlier remain valid as well.

See also [`object_by_name\(\)`](#), [`object_names\(\)`](#) and others.**Parameters**

- **obj** (*Any*) – The object.
- **name** (*str*) – The new name.

Return type

None

objects_by_type(*obj_type*, *toplevel_only*=True)

Return all stored objects that are instance of a given type.

See also [add_object\(\)](#) and others.

Parameters

- **obj_type** (*type[T]*) – The type.
- **toplevel_only** (*bool*) – Whether to return only objects that are defined on project level.

Return type

Sequence

add_object(*obj*)

Add an object to the store and return its name.

If the object already is the store, and already has a friendly name, this one is returned. So, in fact, this method has the same effect as [object_name\(\)](#). It might just express your intent better than that one in some cases.

See also [object_by_name\(\)](#), [objects_by_type\(\)](#) and others.

Parameters

obj (*Any*) – The object to add.

Return type

str

is_friendly_name(*name*)

Returns whether the given name is a friendly one.

Parameters

name (*str*) – The name to check.

Return type

bool

is_toplevel_object(*obj*)

Return whether a given object represents the definition of an object on the Annize project file root level (e.g. by the top level tags in .xml configuration files).

Parameters

obj (*Any*) – The object to check.

Return type

bool

mark_object_as_toplevel(*obj*)

Mark an object as a toplevel one. See [is_toplevel_object\(\)](#).

Parameters

obj (*Any*) – The object.

Return type

None

object_metadata(*obj*, *key*, *default*=None)

Return a piece of metadata for a given object (or a default value if there is no value by the given key).

See also [set_object_metadata\(\)](#).

Parameters

- **obj** (*Any*) – The object.
- **key** (*str*) – The metadata key.
- **default** (*Any*) – The default value.

Return type*Any***set_object_metadata**(*obj*, *key*, *value=None*)

Store a piece of metadata for a given object.

See also [*object_metadata\(\)*](#).**Parameters**

- **obj** (*Any*) – The object.
- **key** (*str*) – The metadata key.
- **value** (*Any*) – The metadata value to store for this object and key.

Return type

None

__put_object(*name*, *obj*)**Parameters**

- **name** (*str*)
- **obj** (*Any*)

Return type

None

__object_raw_name(*obj*)**Parameters****obj** (*Any*)**Return type***str***__object_metadata_dict**(*obj*)**Parameters****obj** (*Any*)**Return type***dict*[*str*, *Any*]**annize.flow.run_context.current()**

Return the current run context.

Note: In most cases you do not need to use this function directly. See the other functions defined on module level.

If there is no current run context (i.e. this function is called outside the execution of an Annize project), [*OutOfContextError*](#) will be raised.

Return type[*RunContext*](#)

exception `annize.flow.run_context.OutOfContextError`

Bases: `TypeError`

`annize.flow.run_context.object_by_name(name, default=None, *, create_nonexistent=False)`

Same as `RunContext.object_by_name()` on the `_current_` run context (`current()`).

Parameters

- **name** (*str*)
- **default** (*Any*)
- **create_nonexistent** (*bool*)

Return type

Any

`annize.flow.run_context.object_names(obj)`

Same as `RunContext.object_names()` on the `_current_` run context (`current()`).

Parameters

obj (*Any*)

Return type

`list[str]`

`annize.flow.run_context.object_name(obj)`

Same as `RunContext.object_name()` on the `_current_` run context (`current()`).

Parameters

obj (*Any*)

Return type

`str`

`annize.flow.run_context.set_object_name(obj, name)`

Same as `RunContext.set_object_name()` on the `_current_` run context (`current()`).

Parameters

- **obj** (*Any*)
- **name** (*str*)

Return type

`None`

`annize.flow.run_context.objects_by_type(obj_type, toplevel_only=True)`

Same as `RunContext.objects_by_type()` on the `_current_` run context (`current()`).

Parameters

- **obj_type** (*type[T]*)
- **toplevel_only** (*bool*)

Return type

Sequence

`annize.flow.run_context.add_object(obj)`

Same as `RunContext.add_object()` on the `_current_` run context (`current()`).

Parameters

obj (*Any*)

Return type

str

`annize.flow.run_context.is_friendly_name(name)`Same as `RunContext.is_friendly_name()` on the `_current_run` context (`current()`).**Parameters****name** (str)**Return type**

bool

`annize.flow.run_context.is_toplevel_object(obj)`Same as `RunContext.is_toplevel_object()` on the `_current_run` context (`current()`).**Parameters****obj** (Any)**Return type**

bool

`annize.flow.run_context.object_metadata(obj, key, default=None)`Same as `RunContext.object_metadata()` on the `_current_run` context (`current()`).**Parameters**

- **obj** (Any)
- **key** (str)
- **default** (Any)

Return type

Any

`annize.flow.run_context.set_object_metadata(obj, key, value=None)`Same as `RunContext.set_object_metadata()` on the `_current_run` context (`current()`).**Parameters**

- **obj** (Any)
- **key** (str)
- **value** (Any)

Return type

None

annize.flow.runner module

The Annize runner.

See [Runner](#).

```
class annize.flow.runner.Runner(*, project, selected_task=None, user_feedback_answers,
                                user_feedback=None)
```

Bases: ABC

Base class for an Annize runner. It contains the base logic of project materialization and choosing and executing a task.

Parameters

- **project** (`ProjectNode`)
- **selected_task** (`str | None`)
- **user_feedback_answers** (`dict[str, Any]`)
- **user_feedback** (`annize.user_feedback.UserFeedbackController`)

run_runner()

Return type

`None`

abstractmethod show_task_chooser()

Return type

`None`

abstractmethod show_task_execution()

Return type

`None`

abstractmethod show_task_execution_success()

Return type

`None`

get_tasks()

Return type

`list[str]`

get_selected_task()

Return type

`str`

set_selected_task(task_name)

Parameters

task_name (`str`)

Return type

`None`

is_finished()

Return type

`bool`

get_success_state()

Return type

`Tuple[bool, str]`

wait_finished()

Return type

`None`

```
__do_run(project)
```

Parameters

project ([ProjectNode](#))

```
__set_tasks(tasks)
```

Parameters

tasks (*list[str]*)

Return type

None

```
__set_success_state(success, message)
```

Parameters

- **success** (*bool*)
- **message** (*str*)

Return type

None

```
_abc_impl = <_abc._abc_data object>
```

annize.fs package

Annize filesystem API.

Used by Annize Features.

See [Path](#), [FilesystemContent](#) and others.

```
class annize.fs.FilesystemContent(generate_func)
```

Bases: `object`

Base class for a source of arbitrary filesystem content.

It provides access to that content by [path\(\)](#). Some implementations will return a static path to already existing content, while other implementations will return a temporary path to ad-hoc generated content.

This content can be a file, a complete directory, or anything else. It could even return a path that points to nothing. It depends on the actual implementation what kind of content it provides.

This type is used instead of plain paths in situations where dynamic filesystem content might be exchanged (usually via some temporary files) instead of already existing files or directories. So, a `FilesystemContent` usually provides a path for reading. There is no strict rule against writing at that path, but that might lead to expected behavior (e.g. when the path points to a temporary copy of something, so changes do not take the desired effect, or when it has undesired side effects on other consumers of the same instance). There might be features whose internal code does that in order to automatically handle relative paths.

Parameters

generate_func (*Callable[[], TInputPath]*) – The content generator function. It has no parameters and returns an absolute path to the content (usually inside some temporary directory).

path()

Return the path that points to the content.

It always returns the same path and does not do any further processing when called more than once (so it is safe and cheap to call that multiple times).

Return type[Path](#)**class** `annize.fs.Path(*args, **kwargs)`Bases: `Path`, [FilesystemContent](#)

A path.

This is compatible to `pathlib.Path`, but provides some convenience methods that can save a few lines of code for typical operations.

Each path is also a [FilesystemContent](#). However, since `FilesystemContent` only allows absolute paths, using a relative path as a `FilesystemContent` will fail at runtime! See also [content\(\)](#).

Parameters

args (`str` / `Path` / [FilesystemContent](#)) – Path parts. Often this is one string, one `pathlib.Path` or one [FilesystemContent](#). The latter one is only allowed as the first part.

`_path()`Return itself (in order to implement [FilesystemContent](#)).**Return type**[Path](#)**`path()`**Return itself (in order to implement [FilesystemContent](#)).**Return type**[Path](#)**`children()`**Like `iterdir()`, but sorted by name.**Return type**[Sequence](#)[[Path](#)]**`ctime()`**

Return the ctime for this path.

Return type[datetime](#)**`mtime()`**

Return the mtime for this path.

Return type[datetime](#)**`write_file(data)`**Write data to a file at this path (like `write_text` or `write_bytes`).**Parameters****data** (`bytes` / [TrStr](#) / `str`) – The data to write.**Return type**

None

`remove(*, missing_ok=True)`

Remove the file, directory, symlink, ... at this path.

Parameters**missing_ok** (`bool`) – Whether it is okay if there is nothing at this path.

Return type

None

file_size()

Return the file size in bytes.

Return type

int

temp_clone(***, *temp_root_path=None*, *basename=None*)

Return a temporary clone of the content at this path.

Parameters

- **temp_root_path** (*str* / *Path* / *None*) – Optional root directory for temporary files. If unset, an OS-default will be used.
- **basename** (*str* / *None*) – Optional new basename. If unset, the original one will be used.

Return type*Path***TTransferFilter**alias of `Callable[[Path, Path, Path], bool]`**copy_to**(*destination*, ***, *destination_as_parent=False*, *merge=False*, *overwrite=False*, *transfer_filter=None*)

Copy the file, directory, symlink, ... at this path to a given destination. All missing parent directories in the destination path get created automatically.

Parameters

- **destination** (*str* / *Path*) – The destination.
- **destination_as_parent** (*bool*) – Whether to consider the destination as the parent of the new destination (instead of the new destination itself). The actual destination will have the same basename as the source then.
- **merge** (*bool*) – Whether to merge the source content into the destination. If not, each new destination directory will replace the existing one or even fail.
- **overwrite** (*bool*) – Whether to allow overwriting of the destination.
- **transfer_filter** (`Callable[[Path, Path, Path], bool] / None)` – The optional transfer filter to use. It can exclude particular parts from the transfer. It is a function with three *Path* parameters: The relative path of an item, the absolute source path and the absolute destination path. It returns `False` to skip that item.

Return type*Path***move_to**(*destination*, ***, *destination_as_parent=False*, *merge=False*, *overwrite=False*, *transfer_filter=None*)

Move the file, directory, symlink, ... at this path to a given destination. All missing parent directories in the destination path get created automatically.

Parameters

- **destination** (*str* / *Path*) – The destination.
- **destination_as_parent** (*bool*) – Whether to consider the destination as the parent of the new destination (instead of the new destination itself). The actual destination will have the same basename as the source then.

- **merge** (*bool*) – Whether to merge the source content into the destination. If not, each new destination directory will replace the existing one or even fail.
- **overwrite** (*bool*) – Whether to allow overwriting of the destination.
- **transfer_filter** (*Callable*[[*Path*, *Path*, *Path*], *bool*] | *None*) – The optional transfer filter to use. It can exclude particular parts from the transfer. It is a function with three *Path* parameters: The relative path of an item, the absolute source path and the absolute destination path. It returns *False* to skip that item.

Return type

Path

class TransferFilters

Bases: object

class And(**inner_filters*)

Bases: object

Parameters

inner_filters (*Path*.*TTransferFilter*)

class _TransferHelper

Bases: object

static transfer_to(*source*, *destination*, *, *merge*, *overwrite*, *destination_as_parent*, *action*, *transfer_filter*=*None*)

Parameters

- **source** (*Path*)
- **destination** (*Path*)
- **merge** (*bool*)
- **overwrite** (*bool*)
- **destination_as_parent** (*bool*)
- **action** (*Callable*)
- **transfer_filter** (*Callable*[[*Path*, *Path*, *Path*], *bool*] | *None*)

Return type

Path

static transfer_action_copy(*source*, *destination*)

Parameters

- **source** (*Path*)
- **destination** (*Path*)

Return type

None

static transfer_action_move(*source*, *destination*)

Parameters

- **source** (*Path*)
- **destination** (*Path*)

Return type

None

static _TransferHelper__transfer_piece(*action*, *transfer_filter*, *source*, *destination*, *merge*, *overwrite*, *relative_path*=*"*)

Parameters

- **action** (*Callable*)
- **transfer_filter** (*Callable*[[*Path*, *Path*, *Path*], *bool*] | *None*)
- **source** (*Path*)

- **destination** ([Path](#))
- **merge** (*bool*)
- **overwrite** (*bool*)
- **relative_path** (*str*)

Return type

None

`annize.fs.content(f, *, root=None)`

Return a [FilesystemContent](#) for an arbitrary given path or [FilesystemContent](#).

If the input already is a valid [FilesystemContent](#), it gets returned as-is. If the input is a string, it automatically gets interpreted as a path (like [Path](#)). If it is a relative path, this function will return a [FilesystemContent](#) that interprets it relative to the current Annize project root directory (which only makes sense when used inside an Annize project execution) or another root location.

Parameters

- **f** (*str* | [Path](#) | [FilesystemContent](#)) – The input path or filesystem content.
- **root** (*str* | [Path](#) | [FilesystemContent](#) | *None*) – The path or filesystem content to be used as root directory for relative paths in **f**.

Return type

[FilesystemContent](#)

`annize.fs.fresh_temp_directory(name=None, *, temp_root_path=None)`

Return a fresh empty temporary directory for arbitrary usage.

This directory will automatically be removed after the Annize project run has been finished. It can only be used for a `with`-block, which removes it directly after this block. Each instance can only be used once in the latter way.

For usage without a `with`-block, see [annize.fs.ext.FreshTempDirectory.path](#).

Parameters

- **name** (*str* | [Path](#) | *None*) – The optional directory name. Otherwise, the implementation will choose a name.
- **temp_root_path** (*str* | [Path](#) | *None*) – Optional root directory for temporary files. If unset, an OS-default will be used.

Return type

[FreshTempDirectory](#)

`annize.fs.dynamic_file(*, content, file_name=None, temp_root_path=None)`

Return a ‘filesystem content’ that provides a file with some given content.

Parameters

- **content** (*str* | *bytes* | *Callable[[], str | bytes]*) – The content of this dynamic file. This may be either direct content (*str* or *bytes*) or a function that returns content.
- **file_name** (*str* | *None*) – The optional file name. Otherwise, the implementation will choose a name.
- **temp_root_path** (*str* | [Path](#) | *None*) – Optional root directory for temporary files. If unset, an OS-default will be used.

Return type

[FilesystemContent](#)

Submodules

annize.fs.ext module

Annize filesystem API extensions.

Note: Commonly used functionality is also available in simpler ways (e.g. somehow in [annize.fs](#)).

class `annize.fs.ext.FreshTempDirectory`(*name=None, *, temp_root_path=None*)

Bases: `object`

A fresh empty temp directory for arbitrary usage.

See [annize.fs.fresh_temp_directory\(\)](#).

Do not use directly.

Parameters

- **name** (*str* | *Path* | *None*)
- **temp_root_path** (*str* | *Path* | *None*)

property path: [Path](#)

The path of this temp directory.

It is empty after creation and will be removed automatically after usage.

__cleanup()

class `annize.fs.ext.DynamicFile`(**, content, file_name=None, temp_root_path=None*)

Bases: [FilesystemContent](#)

A filesystem content that provides a file with some given content.

See [annize.fs.dynamic_file\(\)](#).

Do not use directly.

Parameters

- **content** (*str* | *bytes* | *Callable*[[*str* | *bytes*]], *str* | *bytes*)
- **file_name** (*str* | *None*)
- **temp_root_path** (*str* | *Path* | *None*)

_TStaticContent = *str* | *bytes*

_TContent

alias of *str* | *bytes* | *Callable*[[*str* | *bytes*]]

_path()

class `annize.fs.ext.Mount`(*src, dst, *, options=(), mount_command=('mount',), umount_command=('umount',))*

Bases: `object`

Mounting of a filesystem.

This mounts a filesystem as long as its context is entered (with-block).

Parameters

- **src** (*str* | *Path*) – The filesystem to mount. Often a device file.

- **dst** (*str* / *Path*) – The mount-point.
- **options** (*Iterable*[*str*]) – Additional mount options.
- **mount_command** (*Iterable*[*str*]) – The mount command to use.
- **umount_command** (*Iterable*[*str*]) – The umount command to use.

property destination: *Path*

The mount-point.

annize.i18n package

Annize i18n backend.

The most fundamental mechanism around i18n is to get a translatable text (*TrStr*) from somewhere and get a translation from it, e.g. via *TrStr.translate()* or *translate()*.

Usually the translation is based on the current culture (*current_culture()*) - during project execution this iterates over the project's target cultures, while in UI contexts it is equal to *annize_user_interaction_culture()*.

There can be *TrStr* coming from various sources with various implementations. A common one is *ProvidedTrStr*, which is backed by the so-called "translation providers". One typical translation provider implementation is internally based on *gettext*. There is always at least one translation provider instance of that type, fetching translations from Annize own *gettext* translations. In general, translation providers could be based on arbitrary sources and is not restricted at all to *gettext*.

Other *TrStr* might have arbitrary other ways to translate texts, not backed by translation providers. Often they generate translations dynamically, e.g. by combining other *TrStr*.

At higher level, Annize i18n provides the following functionality:

- It hosts Annize own text translations. They are backed by *gettext* and typically referenced by *tr()* internally.
 - Annize projects are allowed to use those texts when convenient. A translation provider for them always exists, so

a project could contain nodes like `<String xmlns="annize:i18n" string_name="an_int_DebianPackage"/>`. Find all available texts in the top level directory i18n of Annize.

- It allows Annize projects to define and use own translated texts. - Either directly inside project configuration or via *gettext*.

The former can be done with a node like `<String xmlns="annize:i18n"><String.en>Yes</String.en><String.de>Ja</String.de></String>`. Usage of *gettext* involves the definition of a *annize.features.i18n.gettext.TextSource* and nodes like `<String.stringtr xmlns="annize:i18n">tr("myOwnStringName")</String.stringtr>`. More steps are needed to generate the required .mo-files (see below). Note: Even for texts that are directly defined in the project, if you add a *string_name* to them, you can also reference them in the same way as *gettext* based texts.

- It allows Annize projects to override Annize own text translations. - Either directly inside project configuration or via *gettext* (mostly like described above). It is also

possible add new languages or to override only some languages.

- It helps Annize projects to deal with *gettext* .mo- and .po-files; no matter whether these texts are used in the Annize project configuration or in the project's source code. See *annize.features.i18n.gettext.UpdatePOs* and *annize.features.i18n.gettext.GenerateMOs*.

class `annize.i18n.TranslationProvider`Bases: `ABC`

Base class for objects that provide translations for some strings in some languages (here usually called: cultures).

Most translatable texts are backed by translation providers (some only indirectly or not at all). This class is a fundamental part of the Annize i18n API, although only small parts of Annize code need to deal with them directly.

See `translate()` and also `translation_providers()` and `add_translation_provider()`.

abstractmethod `translate(string_name, *, culture)`

Return the translation of a given text for a given culture (or `None` if there is no translation for it).

Note: This does NOT obey the culture's fallbacks (see `Culture.fallback_cultures`)! That functionality is implemented in higher level parts of the API.

Parameters

- **string_name** (`str`) – The string name.
- **culture** (`Culture`) – The culture.

Return type

`str` | `None`

`_abc_impl = <_abc._abc_data object>`

class `annize.i18n.GettextTranslationProvider(mo_path, domain_name=None)`Bases: `TranslationProvider`

A translation provider that is backed by `.mo`-files from `gettext`.

Parameters

- **mo_path** (`annize.fs.TInputPath`)
- **domain_name** (`str` | `None`)

translate(`string_name, *, culture`)

Return the translation of a given text for a given culture (or `None` if there is no translation for it).

Note: This does NOT obey the culture's fallbacks (see `Culture.fallback_cultures`)! That functionality is implemented in higher level parts of the API.

Parameters

- **string_name** – The string name.
- **culture** – The culture.

class `_NoneTranslations(fp=None)`

Bases: `NullTranslations`

`_abc_impl = <_abc._abc_data object>`

`annize.i18n._current_translation_providers_lists()`

`annize.i18n.add_translation_provider(provider, *, priority=0)`

Add a new translation provider.

When inside an Annize run context (see `annize.flow.run_context`), the translation provider will automatically be removed after the run context and will not affect other run contexts.

See also `translation_providers()`.

Parameters

- **provider** ([TranslationProvider](#)) – The new translation provider.
- **priority** (*int*) – The priority. Providers with lower priority value are queried earlier.

Return type

None

`annize.i18n.translation_providers()`

Return all translation providers (ordered ascending by their priority).

See also [add_translation_provider\(\)](#).

Return type*Sequence*[[TranslationProvider](#)]`annize.i18n.tr(string_name, *, culture=None)`

Return the translation for a text in the current culture or any other one, or raise [TranslationUnavailableError](#) if no translation is available for that culture (or its fallbacks).

Instead of this function, depending on the use case, [TrStr.tr\(\)](#) might be the right choice.

Parameters

- **string_name** (*str*) – The string name.
- **culture** ([Culture](#) | *str* | *None*) – The culture.

Return type*str*`class annize.i18n.TrStr`

Bases: [ABC](#)

Base class for translatable texts.

Each instance can hold the translation for one text for different cultures. In order to translate it to the current culture, the simplest is to just apply `str()` on it.

See also [tr\(\)](#).

`static tr(string_name)`

Return a translatable text (by querying the translation providers; see [translation_providers\(\)](#)).

Parameters

string_name (*str*) – The string name.

Return type[TrStr](#)`translate(culture=None)`

Return the translation of this text for the current culture or any other one, or raise [TranslationUnavailableError](#) if no translation is available for that culture (or its fallbacks).

Parameters

culture ([Culture](#) | *str* | *None*) – The culture.

Return type*str*

abstractmethod `get_variant(culture)`

Return the translation of this text for a given culture (or `None` if there is no translation for it).

Note: This is implemented by subclasses, but usually not called directly from outside. See `translate()`. This does NOT obey the culture's fallbacks.

Parameters

culture (`Culture`) – The culture.

Return type

`str` | `None`

format (*args, **kwargs)

Return a formatted variant of this text (i.e. similar to `Python str.format()`).

Parameters

- **args** – Formatting args.
- **kwargs** – Formatting kwargs.

Return type

`TrStr`

`_abc_impl = <_abc._abc_data object>`

class `annize.i18n._FormattedTrStr(original_trstr, args, kwargs)`

Bases: `TrStr`

Parameters

original_trstr (`TrStr`)

get_variant(culture)

Return the translation of this text for a given culture (or `None` if there is no translation for it).

Note: This is implemented by subclasses, but usually not called directly from outside. See `translate()`. This does NOT obey the culture's fallbacks.

Parameters

culture – The culture.

`_abc_impl = <_abc._abc_data object>`

class `annize.i18n.ProvidedTrStr(string_name)`

Bases: `TrStr`

Representation for a translatable text backed by the translations providers.

Do not use directly. See `TrStr.tr()`.

Parameters

string_name (`str`) – The string name.

property `string_name`

get_variant(culture)

Return the translation of this text for a given culture (or `None` if there is no translation for it).

Note: This is implemented by subclasses, but usually not called directly from outside. See `translate()`. This does NOT obey the culture's fallbacks.

Parameters

culture – The culture.

```
_abc_impl = <_abc._abc_data object>
```

```
annize.i18n.TrStrOrStr = annize.i18n.TrStr | str
```

Type annotation for something that can be either a `str` or a `TrStr`.

```
annize.i18n.translate(text, *, culture=None)
```

Translate a given text (if it is not a plain `str`) to the current culture or any other one, or raise `TranslationUnavailableError` if no translation is available for that culture (or its fallbacks).

This is a convenience function that (a) can take either a translatable text or a plain `str` and (b) allows to specify the target culture. In cases this is not needed, there are probably simpler ways to do the same.

Parameters

- **text** (`TrStr` / `str`) – The text to translate.
- **culture** (`Culture` / `str` / `None`) – The culture.

Return type

`str`

```
annize.i18n.translate_or_none(text, *, culture=None)
```

Same as `translate()`, but allows `text` to be `None` (returning `None` then).

Parameters

- **text** (`TrStr` / `str` / `None`) – The text to translate.
- **culture** (`Culture` / `str` / `None`) – The culture.

Return type

`str` | `None`

```
annize.i18n.to_trstr(text)
```

Return a translatable text for a given text.

This is a no-op for translatable texts, but returns a (technically) translatable text for a plain `str`. In the latter case, the translation will be the input text for all cultures.

This is useful when you need a translatable text (e.g. as input parameter) but maybe only have a plain `str`.

Parameters

text (`TrStr` / `str`) – The text.

Return type

`TrStr`

```
class annize.i18n._FixedTrStr(text)
```

Bases: `TrStr`

Parameters

text (`str`)

```
get_variant(culture)
```

Return the translation of this text for a given culture (or `None` if there is no translation for it).

Note: This is implemented by subclasses, but usually not called directly from outside. See `translate()`. This does NOT obey the culture's fallbacks.

Parameters

culture – The culture.

```
_abc_impl = <_abc._abc_data object>
```

```
class annize.i18n.Culture(english_lang_name, iso_639_1_language_code, region_code, fallback_cultures)
```

Bases: object

Representation for an Annize culture. This includes the specification of a language and an optional language variant.

The major purpose of Annize i18n backend is to generate culture-specific translations for some texts.

Enter the culture context (with-block) in order to make it the current culture. This can also be done in a nested way (the former current culture does not take any effect meanwhile, but becomes the current culture again after this context). This is done by the UI, but also during the execution of an Annize project (iterating over its target cultures).

Annize projects choose their target cultures by means of [annize.features.i18n.common.Culture](#).

Do not use directly. See e.g. [get_from_iso_639_1_lang_code\(\)](#) and [culture_by_spec\(\)](#).

Parameters

- **english_lang_name** (*str*) – The language name in English.
- **iso_639_1_language_code** (*str*) – The ISO-639-1 language code, like "en".
- **region_code** (*str* / *None*) – Optional language variant region_code, like "US".
- **fallback_cultures** (*Iterable[Culture]*) – List of fallback cultures. See [fallback_cultures](#).

```
static get_from_iso_639_1_lang_code(iso_639_1_language_code, region_code=None, *,
                                   fallback_cultures=())
```

Return a culture by its ISO-639-1 language code (and an optional region_code).

Parameters

- **iso_639_1_language_code** (*str*) – The ISO-639-1 language code, like "en".
- **region_code** (*str* / *None*) – Optional language variant region_code, like "US".
- **fallback_cultures** (*Iterable[Culture]*) – List of fallback cultures. See [fallback_cultures](#).

Return type

[Culture](#)

```
property english_lang_name: str
```

The language name in English.

```
property iso_639_1_language_code: str
```

The ISO-639-1 language code, like "en".

```
property region_code: str | None
```

Optional language variant region_code, like "US".

```
property full_name: str
```

The full culture code (incl. the region code), like "en-US" or "en".

```
property fallback_cultures: Sequence[Culture]
```

Fallback cultures.

Most parts of the API (unless documented otherwise) try those fallback cultures (in their original order) when an operation was not possible with this culture (e.g. there was no translation available for this culture).

This can be used for cultures that ‘inherit’ from other ones, but also internally by Annize UI in order to fall back to English if there is no UI translation available for the user’s language.

Note: For a culture with a region code, fallbacks usually contain the region-less culture implicitly, so e.g. `de_DE` and `de_CH` automatically fall back to `de`.

culture_list()

Return a list that starts with this culture and then all fallback cultures in an expanded way, i.e. including their fallback cultures (recursively).

The result does never contain duplicates and also handles circular references of fallback cultures.

For any function that explicitly regards fallback cultures, this is the list they iterate over.

Return type

Iterable[[Culture](#)]

__best_system_locale()**Return type**

`str`

__current_system_locale_setup()**Return type**

[_TSystemLocaleSetup](#)

__set_system_locale_setup()**Parameters**

system_locale_setup (*[_TSystemLocaleSetup](#)*)

Return type

`None`

__set_env__var(value)**Parameters**

- **key** (*str*)
- **value** (*str* | *None*)

Return type

`None`

class [_TSystemLocaleSetup](#)(*LC_ALL: str | None, LANGUAGE: str | None*)

Bases: `object`

Parameters

- **LC_ALL** (*str* | *None*)
- **LANGUAGE** (*str* | *None*)

LC_ALL: *str* | *None*

LANGUAGE: *str* | *None*

class `annize.i18n.UnspecifiedCulture`

Bases: [Culture](#)

Unspecified culture.

To be used whenever no particular culture is specified.

Do not use directly. See e.g. `get_from_iso_639_1_lang_code()` and [culture_by_spec\(\)](#).

Parameters

- **english_lang_name** – The language name in English.
- **iso_639_1_language_code** – The ISO-639-1 language code, like "en".
- **region_code** – Optional language variant region_code, like "US".
- **fallback_cultures** – List of fallback cultures. See `fallback_cultures`.

class `annize.i18n._CultureFence`

Bases: [Culture](#)

Do not use directly. See e.g. `get_from_iso_639_1_lang_code()` and [culture_by_spec\(\)](#).

Parameters

- **english_lang_name** – The language name in English.
- **iso_639_1_language_code** – The ISO-639-1 language code, like "en".
- **region_code** – Optional language variant region_code, like "US".
- **fallback_cultures** – List of fallback cultures. See `fallback_cultures`.

`annize.i18n._last_resort_culture` = <`annize.i18n.Culture` object>

The last resort culture. In some internal places, this is used as the final fallback if the specified culture (incl. its fallbacks) is not available.

`annize.i18n.culture_by_spec(culture)`

Return a culture for a given culture spec (i.e. a culture, a string representing one or None).

This is a no-op for a culture, return the current culture for None or uses [Culture.get_from_iso_639_1_lang_code\(\)](#) for a string (after maybe splitting it into the language code and the region code).

Parameters

culture ([Culture](#) / *str* / *None*) – The culture spec.

Return type

[Culture](#)

`annize.i18n.current_culture()`

Return the current culture. If there is no current culture, raise [NoCurrentCultureError](#).

During project execution, this is usually not the same as the [annize_user_interaction_culture](#) but one of the cultures targeted by that project.

Return type

[Culture](#)

`annize.i18n._annize_user_interaction_culture()`

Return type

[Culture](#)

`annize.i18n.annize_user_interaction_culture` = <`annize.i18n.Culture` object>

The culture for interaction with the user. During project execution, this is potentially not the same as the [current_culture\(\)](#).

`annize.i18n.friendly_join_string_list(texts)`

Return a translatable string for a list of texts. They usually get concatenated with ", " between, but with something like " and " as the last separator; like "foo, bar and baz".

Parameters

texts (*Iterable*[[TrStr](#) | *str*]) – The input texts.

Return type

[TrStr](#)

exception `annize.i18n.NoCurrentCultureError`

Bases: `TypeError`

Error that occurs when the current culture was requested when there is no current culture.

exception `annize.i18n.TranslationUnavailableError`(*text*, *language*)

Bases: `TypeError`

Error that occurs when a translatable text was asked for translation to a language where no translation is available for.

Parameters

- **text** ([TrStr](#))
- **language** (*str*)

`annize.i18n.CultureSpecT = annize.i18n.Culture | str | None`

Types that can specify a particular culture. See e.g. [culture_by_spec\(\)](#).

[annize.object](#) package

Annize objects.

There is no particular subclass that all Annize objects inherit from! Annize objects can be of arbitrary types (as long as their constructor has a signature that Annize can deal with).

There are some decorators for optional configuration and finetuning of Annize objects' methods and attributes here.

`annize.object.explicit_only`(*parameter_name*)

Return a decorator function that marks a given parameter as “explicit only”, so potential arguments without an `arg_name` will never automatically be matched to that parameter.

Note: For any parameter with a type that already appeared at earlier parameters of the constructor signature, a similar effect will occur implicitly, because the materializer would always take the first possible parameter when it tries to auto-assign arguments.

Parameters

parameter_name (*str*) – The name of the constructor parameter to mark as “explicit only”.

Submodules**[annize.object.config](#) module**

Configurations of objects and parts of it. Only used internally, e.g. by the functionality of [annize.object](#).

`annize.object.config.parameter_config`(*for_type*, *parameter_name*)

Return a parameter configuration for a given parameter of a given object's constructor.

Parameters

- **for_type** (*type*) – The type.
- **parameter_name** (*str*) – The constructor's parameter name.

Return type

[ParameterConfig](#)

class `annize.object.config.ParameterConfig`(*explicit_only*)

Bases: `object`

A parameter configuration. It contains additional, Annize-specific configuration for a parameter of an object's constructor.

See [`parameter_config\(\)`](#).

Parameters

explicit_only (*bool*)

explicit_only: `bool`

Whether this parameter is marked as “explicit only”. See [`annize.object.explicit_only\(\)`](#).

class `annize.object.config.InnerParameterConfig`(*explicit_only=None*)

Bases: `object`

An inner parameter configuration. Similar to [`ParameterConfig`](#) but not frozen and with default values.

Used for keeping configuration data in memory. For usage, see [`ParameterConfig`](#).

Parameters

explicit_only (*bool | None*)

explicit_only: `bool | None = None`

annize.project package

Annize projects.

See `Project`, [`Node`](#) and also the submodules.

`annize.project.load`(*project_path*, *, *inspector=None*)

Load a project from disk. Return `None` if the given path does not point into an Annize project.

Parameters

- **project_path** (*str | Path*) – A path somewhere inside the project to be opened.
- **inspector** ([`FullInspector`](#) | *None*) – The custom project inspector to use.

Return type

[`ProjectNode`](#) | *None*

`annize.project.create_new`(*root_directory*, *subdirectory_name*='meta', *, *inspector=None*)

Create a new Annize project.

This will create an initial version of the Annize project configuration on disk as well.

Parameters

- **root_directory** (*str | Path*) – The project root path.
- **subdirectory_name** (*str*) – The subdirectory name where to store the Annize configuration files inside the project root directory. This is not arbitrary but must be one of the well known ones!
- **inspector** ([`FullInspector`](#) | *None*) – The custom project inspector to use.

Return type

[`ProjectNode`](#)

class annize.project.Node

Bases: ABC

Nodes are the building blocks of a project.

They exist in a serialized way in the project files (usually xml), and when the project is loaded to memory (see [annize.project.loader](#)) they are represented by a structure of Node instances.

Each Node has various features (see methods and properties of this class), e.g. it can be observed for changes. Each node can also have children. This is just a base class for more specific node types, though. See also its subclasses in the same module.

The most relevant subclass in many regards is [ObjectNode](#).

add_change_handler(handler, *, also_watch_children)

Add a function that handles changes on this node.

See also [remove_change_handler\(\)](#).

Parameters

- **handler** (*Callable*[[[ChangeEvent](#)], None]) – The handler function to add.
- **also_watch_children** (*bool*) – Whether this function shall also observe this node's children.

Return type

None

remove_change_handler(handler)

Remove a change handler function that was added by [add_change_handler\(\)](#) earlier.

If that function was added multiple times, it will remove all of them. If the function was not added, this will do nothing.

Parameters

handler (*Callable*[[[ChangeEvent](#)], None]) – The handler function to remove.

Return type

None

property parent: [Node](#) | None

This node's parent node.

property file: [FileNode](#) | None

The file node that contains this node, or itself for file nodes, or None if it is not part of a file node.

This is the same as going [parent](#) upwards until a file node is reached.

property project: [ProjectNode](#) | None

The project node that contains this node, or itself for project nodes, or None if it is not part of a project node.

This is the same as going [parent](#) upwards until a project node is reached.

property children: Sequence[[Node](#)]

This node's child nodes.

insert_child(i, node)

Insert a new child node.

Parameters

- **i** (*int*) – The position.

- **node** ([Node](#)) – The node to insert.

Return type

None

append_child(*node*)

Append a new child node.

Parameters

- **node** ([Node](#)) – The node to append.

Return type

None

remove_child(*node*)

Remove a child node.

If that node is not a child node, it raises a `ValueError`.**Parameters**

- **node** ([Node](#)) – The node to remove.

Return type

None

clone()

Clone this node and return that clone.

The clone is not connected to the original in any way, has no real marshaler (so it cannot be saved) and no changed handler and does not contain the undo history of the original. It is typically used for materialization or similar runtime purposes.

Return type*Self***description**(**, with_children=True, multiline=True*)**Parameters**

- **with_children** (*bool*)
- **multiline** (*bool*)

Return type

str

abstractmethod classmethod _allowed_child_types()

Return a list of node types that this node type allows to have as child nodes.

Return type*Iterable*[*type*[[Node](#)]]**_clone__early**(*new_node*)

Execute arbitrary steps during an early stage of node cloning.

Parameters

- **new_node** (*Self*) – The cloned node.

Return type

None

`_clone__late(new_node)`

Execute arbitrary steps during a late stage of node cloning.

Parameters

`new_node` (*Self*) – The cloned node.

Return type

None

`_property_changed(property_name, old_value)`

Parameters

• **`property_name`** (*str*)

• **`old_value`** (*Any*)

Return type

None

`abstractmethod _str_helper()`

Return type

Iterable[*str*]

`__description(indent, with_children, multiline)`

Parameters

• **`indent`** (*int*)

• **`with_children`** (*bool*)

• **`multiline`** (*bool*)

Return type

str

`__changed__child_added(child_node, child_position)`

Parameters

• **`child_node`** (*Node*)

• **`child_position`** (*int*)

Return type

None

`__changed__child_removed(child_node, child_position)`

Parameters

• **`child_node`** (*Node*)

• **`child_position`** (*int*)

Return type

None

`__changed__property_changed(node, property_name, old_value, new_value)`

Parameters

• **`node`** (*Node*)

• **`property_name`** (*str*)

- **old_value** (*Any*)

- **new_value** (*Any*)

Return type

None

__changed__call__handlers(*event*)

Parameters

event ([ChangeEvent](#))

Return type

None

class [ChangeEvent](#)(*target_node*)

Bases: `object`

Base class for events on a [Node](#). See subclasses and [Node.add_change_handler\(\)](#).

Parameters

target_node ([Node](#))

property **target_node**: [Node](#)

The target node this event is about.

class [__ChildrenListChangeEvent](#)(*target_node, child_node, child_position*)

Bases: [ChangeEvent](#)

Base class for events on a [Node](#) that are about changes on the list of children. See subclasses.

Parameters

- **target_node** ([Node](#))

- **child_node** ([Node](#))

- **child_position** (*int*)

property **child_node**: [Node](#)

The child node this event is about.

property **child_position**: `int`

The position of the child node in the list of children.

class [ChildAddedEvent](#)(*target_node, child_node, child_position*)

Bases: [__ChildrenListChangeEvent](#)

Node event that occurs when a child node was added.

Parameters

- **target_node** ([Node](#))

- **child_node** ([Node](#))

- **child_position** (*int*)

class [ChildRemovedEvent](#)(*target_node, child_node, child_position*)

Bases: [__ChildrenListChangeEvent](#)

Node event that occurs when a child node was removed.

Parameters

- **target_node** ([Node](#))

- **child_node** ([Node](#))
- **child_position** (*int*)

class [PropertyChangeEvent](#)(*target_node, property_name, old_value, new_value*)

Bases: [ChangeEvent](#)

Node event that occurs when a property of a node was changed.

Parameters

- **target_node** ([Node](#))
- **property_name** (*str*)
- **old_value** (*Any*)
- **new_value** (*Any*)

property **property_name**: **str**

The property name.

property **old_value**: **Any**

The old property value.

property **new_value**: **Any**

The new property value.

_abc_impl = **<_abc._abc_data object>**

class [annize.project.ProjectNode](#)(*annize_config_directory*)

Bases: [Node](#)

An Annize project root node.

Each project has exactly one root node. It has no parent. Its children are the Annize project configuration files. It has no direct serialized representation (or, one could argue, it is the directory that contains these files).

Parameters

annize_config_directory (*str* | *Path*)

property **annize_config_directory**: **Path**

The “Annize config directory” of this Annize project.

This is not the same as the project’s “root directory”, but a subdirectory like ‘-meta’ inside it.

save()

Store the current state to the Annize project configuration files.

Return type

None

insert_child(*i, node*)

Insert a new child node.

Parameters

- **i** – The position.
- **node** – The node to insert.

remove_child(*node*)

Remove a child node.

If that node is not a child node, it raises a `ValueError`.

Parameters

node – The node to remove.

changes(*, *since*=0, *until*=9223372036854775807)

Return all changes that happened to the project, since the moment of loading it or any later point in time, and until now or any earlier point in time.

All timestamp arguments are based on an artificial clock (which basically increases by 1 for each change). See also [undo_changes\(\)](#).

Parameters

- **since** (*int*) – The timestamp where to start with returning changes (inclusive).
- **until** (*int*) – The timestamp where to stop with return changes (non-inclusive).

Return type

Sequence[[ChangeEvent](#)]

undo_changes(*since*)

Undo all changes that happened to the project since a given point in time. Timestamps are based on an artificial clock; see [changes\(\)](#).

Parameters

since (*int*) – The timestamp where to start with undoing changes (inclusive).

Return type

`None`

static load(*project_location*, *, *inspector*=None)

Load and return a project node for a given Annize project location.

Do not use it directly. See [annize.project.load\(\)](#).

Parameters

- **project_location** (*str* / *Path*) – A path to somewhere inside an Annize project.
- **inspector** ([FullInspector](#) / *None*) – The custom project inspector to use.

Return type

[ProjectNode](#)

classmethod _allowed_child_types()

Return a list of node types that this node type allows to have as child nodes.

_clone__early(*new_node*)

Execute arbitrary steps during an early stage of node cloning.

Parameters

new_node – The cloned node.

_clone__late(*new_node*)

Execute arbitrary steps during a late stage of node cloning.

Parameters

new_node – The cloned node.

_str_helper()

__reset_change_history()

Return type

None

__handle_changed(event)

Parameters

event ([ChangeEvent](#))

Return type

None

__compacted_changes()

Parameters

events ([Sequence](#)[[ChangeEvent](#)])

Return type

[Sequence](#)[[ChangeEvent](#) | None]

__is_inverse_of(event_2)

Parameters

- **event_1** ([ChangeEvent](#))
- **event_2** ([ChangeEvent](#))

Return type

bool

_abc_impl = <_abc._abc_data object>

class `annize.project.FileNode`(*path*, *marshaller*)

Bases: [Node](#)

An Annize project file node.

Each project has one file node per configuration file. They are the children of the [ProjectNode](#). The children of a file node are mostly of type [ObjectNode](#), but can also be different ones.

Parameters

- **path** (*str* | [Path](#))
- **marshaller** (`annize.project.file_formats.FileFormat.Marshaler`)

property path: [Path](#)

The file path.

property marshaller: [Marshaler](#)

The marshaller of this file node. Do not use.

__clone__early(new_node)

Execute arbitrary steps during an early stage of node cloning.

Parameters

new_node – The cloned node.

_str_helper()

```
classmethod _allowed_child_types()
```

Return a list of node types that this node type allows to have as child nodes.

```
_abc_impl = <_abc._abc_data object>
```

```
class annize.project.ArgumentNode
```

Bases: [Node](#), ABC

Base class for nodes that can be used as an argument, usually in an [ObjectNode](#).

See subclasses.

```
property name: str | None
```

The name of this argument node.

Names are used for a few purposes (the documentation will mention that where it is important), but primarily you can refer to a named argument with a [ReferenceNode](#) and you can use it for [append_to](#).

```
property append_to: str | None
```

The name of another argument node where this argument node gets appended to its children at runtime.

This essentially makes this argument node appear twice at runtime. It will also be in the place where it was defined; just a reference to that argument is created as a result.

```
property arg_name: str | None
```

The argument name where this argument is associated to in the parent object.

Valid argument names depend on the type of object that the parent is representing.

```
_str_helper()
```

```
_abc_impl = <_abc._abc_data object>
```

```
class annize.project.ObjectNode(feature, type_name)
```

Bases: [ArgumentNode](#)

An Annize project object node.

In a typical Annize project, most nodes are object nodes. Most structure in their project files represent them (usually the tags in xml files). All the other node types are basically related to containing object nodes (like file nodes or the project root node) or have other support purposes.

Children are mostly other object nodes, [ScalarValueNode](#) or [ReferenceNode](#). They are associated to a particular parameter name (of the object type) by their [ArgumentNode.arg_name](#).

Parameters

- **feature** (*str*)
- **type_name** (*str*)

```
property feature: str
```

The Annize Feature name that provides this object.

```
property type_name: str
```

The name of the type of this object.

```
_str_helper()
```

```
classmethod _allowed_child_types()
```

Return a list of node types that this node type allows to have as child nodes.

```
_abc_impl = <_abc._abc_data object>
```

```
class annize.project.ScalarValueNode
```

Bases: [ArgumentNode](#)

An Annize project scalar value node.

It represents a fixed string value.

property value: Any

The string that this node represents.

```
_str_helper()
```

```
classmethod _allowed_child_types()
```

Return a list of node types that this node type allows to have as child nodes.

```
__shorten(max_length=100)
```

Parameters

- **obj** (Any)
- **max_length** (int)

Return type

str

```
_abc_impl = <_abc._abc_data object>
```

```
class annize.project.ReferenceNode
```

Bases: [ArgumentNode](#)

A reference node.

This node represents a reference to another argument node (by its [ArgumentNode.name](#))

property reference_key: str | None

The name of the node this node references to (or none).

property on_unresolvable: [OnUnresolvableAction](#)

```
_str_helper()
```

```
classmethod _allowed_child_types()
```

Return a list of node types that this node type allows to have as child nodes.

```
class OnUnresolvableAction(*values)
```

Bases: Enum

FAIL = 'fail'

SKIP = 'skip'

```
_abc_impl = <_abc._abc_data object>
```

```
class annize.project.IgnoreUnavailableFeatureNode
```

Bases: [Node](#)

An Annize project ignore-unavailable-Feature node.

property feature: `str`

The name of the Feature that gets checked by this node. Empty string or "*" (the default) means all features.

method `_str_helper()`

classmethod `_allowed_child_types()`

Return a list of node types that this node type allows to have as child nodes.

property `_abc_impl = <_abc._abc_data object>`

exception `annize.project.FeatureUnavailableError(feature_name)`

Bases: `ModuleNotFoundError`

Parameters

feature_name (`str`)

exception `annize.project.BadStructureError(message)`

Bases: `ValueError`

Parameters

message (`str`)

exception `annize.project.MaterializerError(message)`

Bases: `TypeError`

Parameters

message (`str`)

exception `annize.project.ParserError(message)`

Bases: `ValueError`

Parsing error like bad input XML.

Parameters

message (`str`)

exception `annize.project.UnresolvableReferenceError(reference_key)`

Bases: `MaterializerError`

Parameters

reference_key (`str`)

Subpackages

`annize.project.file_formats` package

File formats for Annize configuration files.

See also the submodules.

class `annize.project.file_formats.FileFormat`

Bases: `ABC`

A file format for Annize configuration files.

class `Marshaler`

Bases: `ABC`

Base class for marshalers. A marshaler is responsible for one configuration file (i.e. it is associated to one `annize.project.FileNode`). It is provided by the `FileFormat` implementation when it creates file nodes and is responsible for keeping internal structures up-to-date whenever any changes to any node

(inside that file node) get applied. Based on that, it provides functionality like `save_file_node()` and others.

abstractmethod `add_change(change)`

Handle a given change, e.g. keep internal data structure up-to-date. Called for any change that occurs inside this file node.

Parameters

change (`ChangeEvent`) – The change.

Return type

None

abstractmethod `save_file_node()`

Save this file node back to disk.

Return type

None

abstractmethod `serialize_node(node)`

Return a serialized byte string for a given node, e.g. for clipboard operations.

Parameters

node (`ArgumentNode`) – The node to serialize.

Return type

bytes

`_abc_impl = <_abc._abc_data object>`

class `NullMarshaler`

Bases: `Marshaler`

A marshaler that does nothing. It should only be used in particular situations, like for temporarily created nodes.

add_change(change)

Handle a given change, e.g. keep internal data structure up-to-date. Called for any change that occurs inside this file node.

Parameters

change – The change.

save_file_node()

Save this file node back to disk.

serialize_node(node)

Return a serialized byte string for a given node, e.g. for clipboard operations.

Parameters

node – The node to serialize.

`_abc_impl = <_abc._abc_data object>`

abstractmethod `load_file_node(file, inspector)`

Read the given file and return a project file node for it.

That file node has a marshaler, which keeps track of changes (it gets notified by the infrastructure for each change) and is able to save the node back to its file.

Parameters

- **file** (`str` / `Path`) – The file to load.
- **inspector** (`FullInspector`) – The project inspector to use.

Return type`FileNode`**abstractmethod** `new_file_node(file, inspector)`

Return a new empty project file node.

That file node has a marshaler; see `load_file_node()`.**Parameters**

- **file** (`str` / `Path`) – The new file. It should not exist already.
- **inspector** (`FullInspector`) – The project inspector to use.

Return type`FileNode`**serialize_node**(`node`)

Return a serialized byte string for a node, e.g. for clipboard operations.

Parameters**node** (`ArgumentNode`) – The node to serialize.**Return type**`bytes`**abstractmethod** `deserialize_node(s, inspector)`

Return a node for a serialized string, e.g. for clipboard operations.

Parameters

- **s** (`bytes`) – The serialized string.
- **inspector** (`FullInspector`) – The project inspector to use.

Return type`ArgumentNode``_abc_impl = <_abc._abc_data object>``annize.project.file_formats.register_file_format(format_name)`

Return a decorator that registers a file format.

Parameters**format_name** (`str`) – The format name.**Return type**`Callable``annize.project.file_formats.file_format(format_name)`Return a file format by its name (or None if not available). See also `all_file_format_names()`.**Parameters****format_name** (`str`) – The format name. A typical name is "xml".**Return type**`FileFormat` | `None``annize.project.file_formats.all_file_format_names()`

Return all known file format names.

Return type`Sequence[str]`

`annize.project.file_formats.load_project(project_annize_config_directory, *, inspector)`

Load an Annize project from its configuration directory.

Do not use it directly. See [`annize.project.load\(\)`](#).

Parameters

- **project_annize_config_directory** (*str* / *Path*) – The Annize project configuration directory
- **inspector** ([`FullInspector`](#)) – The project inspector to use.

Return type

[`ProjectNode`](#)

Subpackages

[`annize.project.file_formats.xml`](#) package

Subpackages

[`annize.project.file_formats.xml.node_representation_handlers`](#) package

Submodules

[`annize.project.file_formats.xml.node_representation_handlers.argument`](#) module

[`annize.project.file_formats.xml.node_representation_handlers.file`](#) module

[`annize.project.file_formats.xml.node_representation_handlers.ignore_unavailable_feature`](#) module

[`annize.project.file_formats.xml.node_representation_handlers.object`](#) module

[`annize.project.file_formats.xml.node_representation_handlers.reference`](#) module

[`annize.project.file_formats.xml.node_representation_handlers.scalar_value`](#) module

Submodules

[`annize.project.file_formats.xml.marshaler`](#) module

[`annize.project.materializer`](#) package

Materializing of Annize projects into a working runtime structure (usually used by the Runner application).

See [`materialize\(\)`](#).

All submodules are only used internally by this one. There is a core part, some preprocessor functions, some behaviors that implement what it does for different types of project nodes, and the object factory.

class `annize.project.materializer.MaterializationResult`(*root_objects*, *node_association*, *problems*)

Bases: `object`

Parameters

- **root_objects** (*list*[*Any*])
- **node_association** (*dict*[*Node*, *list*[*Any*]])
- **problems** (*dict*[*Node* / *None*, *list*[*Exception*]])

property `root_objects:` `list[Any]`

objects_for_node(*node*)

Parameters

node ([Node](#))

Return type

`list[Any] | None`

erroneous_nodes()

Return type

`list[Node]`

errors_for_node(*node*)

Parameters

node (*Any*)

Return type

`list[Exception]`

`annize.project.materializer.materialize(project, *, feature_loader=None)`

Parameters

- **project** ([ProjectNode](#))
- **feature_loader** ([FeatureLoader](#) | *None*)

Return type

[MaterializationResult](#)

`annize.project.materializer._translate_from_clone(real_nodes_for_clones, node_association, errors)`

`annize.project.materializer._node_clone_link(original_project_node, cloned_project_node)`

Parameters

- **original_project_node** ([ProjectNode](#))
- **cloned_project_node** ([ProjectNode](#))

Return type

`dict[Node, Node]`

Subpackages

`annize.project.materializer.behaviors` package

Behaviors.

See [Behavior](#).

class `annize.project.materializer.behaviors.Behavior`

Bases: `ABC`

A behavior implements what the materializer does for a given node. See subclasses in the submodules.

early_node_context(*early_node_materialization*)

Context for early materialization steps. It works similar to `node_context()`, but the early contexts get entered before the main work (of `node_context()`) begins, and get left afterward. These early contexts are only used for very particular preparation steps. They do not participate in the actual materialization.

Parameters

early_node_materialization (`EarlyNodeMaterialization`)

Return type

ContextManager

abstractmethod node_context(*node_materialization*, *desperate*)

For a node, the materializer will enter the context returned by this function for all behaviors.

The materializer itself does that for the root node. Behaviors itself are responsible for triggering that same process on children.

So, any node gets materialized in the context of all behaviors on all parent nodes. Actual materialization logic happens in this function, in the course of setting up and taking down all these contexts.

Note: Behaviors might fail in some situation, e.g. if a reference is not resolvable yet. The outer routine will retry the materialization process until all behaviors finally succeed or some errors persist.

Parameters

- **node_materialization** (`NodeMaterialization`) – The node materialization for the current node.
- **desperate** (*bool*) – Whether this is a desperate (i.e. late) attempt to materialize, so it is e.g. allowed to consider an unresolvable reference as finally unresolvable.

Return type

ContextManager

`_abc_impl = <_abc._abc_data object>`

Submodules

`annize.project.materializer.behaviors.argument` module

See [ArgumentBehavior](#) and [AssociateArgumentNodeBehavior](#).

class `annize.project.materializer.behaviors.argument.ArgumentBehavior`(*create_object_func* *, *feature_loader*)

Bases: [Behavior](#)

Behavior that handles argument nodes (incl. creation of an object for an object node).

Parameters

feature_loader (`FeatureLoader`)

node_context(*node_materialization*, *desperate*)

For a node, the materializer will enter the context returned by this function for all behaviors.

The materializer itself does that for the root node. Behaviors itself are responsible for triggering that same process on children.

So, any node gets materialized in the context of all behaviors on all parent nodes. Actual materialization logic happens in this function, in the course of setting up and taking down all these contexts.

Note: Behaviors might fail in some situation, e.g. if a reference is not resolvable yet. The outer routine will retry the materialization process until all behaviors finally succeed or some errors persist.

Parameters

- **node_materialization** – The node materialization for the current node.
- **desperate** – Whether this is a desperate (i.e. late) attempt to materialize, so it is e.g. allowed to consider an unresolvable reference as finally unresolvable.

`_abc_impl = <_abc._abc_data object>`

class annize.project.materializer.behaviors.argument.**AssociateArgumentNodeBehavior**(*association*)

Bases: [Behavior](#)

Parameters

association (*dict*[[ArgumentNode](#), *list*[*Any*]])

node_context(*node_materialization*, *desperate*)

For a node, the materializer will enter the context returned by this function for all behaviors.

The materializer itself does that for the root node. Behaviors itself are responsible for triggering that same process on children.

So, any node gets materialized in the context of all behaviors on all parent nodes. Actual materialization logic happens in this function, in the course of setting up and taking down all these contexts.

Note: Behaviors might fail in some situation, e.g. if a reference is not resolvable yet. The outer routine will retry the materialization process until all behaviors finally succeed or some errors persist.

Parameters

- **node_materialization** – The node materialization for the current node.
- **desperate** – Whether this is a desperate (i.e. late) attempt to materialize, so it is e.g. allowed to consider an unresolvable reference as finally unresolvable.

`_abc_impl = <_abc._abc_data object>`

annize.project.materializer.behaviors.basket module

See [BasketBehavior](#).

class annize.project.materializer.behaviors.basket.**BasketBehavior**

Bases: [Behavior](#)

Behavior that handles baskets.

node_context(*node_materialization*, *desperate*)

For a node, the materializer will enter the context returned by this function for all behaviors.

The materializer itself does that for the root node. Behaviors itself are responsible for triggering that same process on children.

So, any node gets materialized in the context of all behaviors on all parent nodes. Actual materialization logic happens in this function, in the course of setting up and taking down all these contexts.

Note: Behaviors might fail in some situation, e.g. if a reference is not resolvable yet. The outer routine will retry the materialization process until all behaviors finally succeed or some errors persist.

Parameters

- **node_materialization** – The node materialization for the current node.
- **desperate** – Whether this is a desperate (i.e. late) attempt to materialize, so it is e.g. allowed to consider an unresolvable reference as finally unresolvable.

```
_abc_impl = <_abc._abc_data object>
```

annize.project.materializer.behaviors.block module

See [*BlockBehavior*](#).

class annize.project.materializer.behaviors.block.**BlockBehavior**

Bases: [*Behavior*](#)

Behavior that handles block.

early_node_context(*early_node_materialization*)

Context for early materialization steps. It works similar to [*node_context\(\)*](#), but the early contexts get entered before the main work (of [*node_context\(\)*](#)) begins, and get left afterward. These early contexts are only used for very particular preparation steps. They do not participate in the actual materialization.

node_context(*node_materialization*, *desperate*)

For a node, the materializer will enter the context returned by this function for all behaviors.

The materializer itself does that for the root node. Behaviors itself are responsible for triggering that same process on children.

So, any node gets materialized in the context of all behaviors on all parent nodes. Actual materialization logic happens in this function, in the course of setting up and taking down all these contexts.

Note: Behaviors might fail in some situation, e.g. if a reference is not resolvable yet. The outer routine will retry the materialization process until all behaviors finally succeed or some errors persist.

Parameters

- **node_materialization** – The node materialization for the current node.
- **desperate** – Whether this is a desperate (i.e. late) attempt to materialize, so it is e.g. allowed to consider an unresolvable reference as finally unresolvable.

```
_abc_impl = <_abc._abc_data object>
```

annize.project.materializer.behaviors.feature_unavailable module

See [*FeatureUnavailableBehavior*](#).

class

annize.project.materializer.behaviors.feature_unavailable.**FeatureUnavailableBehavior**

Bases: [*Behavior*](#)

Behavior that handles ignore-unavailable-Feature nodes.

early_node_context(*early_node_materialization*)

Context for early materialization steps. It works similar to [*node_context\(\)*](#), but the early contexts get entered before the main work (of [*node_context\(\)*](#)) begins, and get left afterward. These early contexts are only used for very particular preparation steps. They do not participate in the actual materialization.

node_context(*node_materialization*, *desperate*)

For a node, the materializer will enter the context returned by this function for all behaviors.

The materializer itself does that for the root node. Behaviors itself are responsible for triggering that same process on children.

So, any node gets materialized in the context of all behaviors on all parent nodes. Actual materialization logic happens in this function, in the course of setting up and taking down all these contexts.

Note: Behaviors might fail in some situation, e.g. if a reference is not resolvable yet. The outer routine will retry the materialization process until all behaviors finally succeed or some errors persist.

Parameters

- **node_materialization** – The node materialization for the current node.
- **desperate** – Whether this is a desperate (i.e. late) attempt to materialize, so it is e.g. allowed to consider an unresolvable reference as finally unresolvable.

`__context_skip_node_feature_ignore_list(node)`

`__context_catch_exceptions(node_materialization, featureignorelist)`

`_abc_impl = <_abc._abc_data object>`

annize.project.materializer.behaviors.reference module

See [ReferenceBehavior](#).

class annize.project.materializer.behaviors.reference.**ReferenceBehavior**

Bases: [Behavior](#)

Behavior that handles reference nodes.

node_context(*node_materialization*, *desperate*)

For a node, the materializer will enter the context returned by this function for all behaviors.

The materializer itself does that for the root node. Behaviors itself are responsible for triggering that same process on children.

So, any node gets materialized in the context of all behaviors on all parent nodes. Actual materialization logic happens in this function, in the course of setting up and taking down all these contexts.

Note: Behaviors might fail in some situation, e.g. if a reference is not resolvable yet. The outer routine will retry the materialization process until all behaviors finally succeed or some errors persist.

Parameters

- **node_materialization** – The node materialization for the current node.
- **desperate** – Whether this is a desperate (i.e. late) attempt to materialize, so it is e.g. allowed to consider an unresolvable reference as finally unresolvable.

`_abc_impl = <_abc._abc_data object>`

Submodules

annize.project.materializer.core module

Inner core parts of the project materializer. Only used internally by the parent package.

class annize.project.materializer.core.**EarlyNodeMaterialization**(*materializer*, *node*, *store*)

Bases: object

Parameters

- **materializer** ([ProjectMaterializer](#))
- **node** ([Node](#))
- **store** (*dict*)

property node: [Node](#)

early_materialize_children()

class annize.project.materializer.core.**NodeMaterialization**(*materializer, node, store*)

Bases: object

Parameters

- **materializer** ([ProjectMaterializer](#))
- **node** ([Node](#))
- **store** (*dict*)

property node: [Node](#)

set_materialized_result(*result*)

Parameters

result (*Iterable[Any]*)

Return type

None

set_problems(*problems*)

Parameters

problems (*Iterable[Exception]*)

materialized_children_tuples(*, *desperate*)

Parameters

desperate (*bool*)

materialized_children(*, *desperate*)

Parameters

desperate (*bool*)

Return type

Iterable[Any]

try_get_materialization_for_node(*node*)

Parameters

node ([Node](#))

property has_result

property result: *Sequence[Any]*

property problems: *Sequence[Exception]*

class annize.project.materializer.core.**ProjectMaterializer**(*node, *, behaviors*)

Bases: object

Parameters

- **node** ([Node](#))
- **behaviors** (*Iterable[annize.project.materializer.behaviors.Behavior]*)

materialize()

Return type

`tuple[Sequence[Any] | None, dict[Node, Sequence[Exception]]]`

_early_materialize(*node*, *early_materialization_store*)

_materialize_hlp_childobjs(*node*, *materialization_store*, *desperate*)

Parameters

- **node** (`Node`)
- **materialization_store** (`dict`)
- **desperate** (`bool`)

Return type

`list[tuple[Node, Sequence[Any]]]`

__early_materialization_for_node(*node*, *early_materialization_store*)

Parameters

- **node** (`Node`)
- **early_materialization_store** (`dict`)

Return type

`EarlyNodeMaterialization`

__materialization_for_node(*node*, *materialization_store*)

Parameters

- **node** (`Node`)
- **materialization_store** (`dict`)

Return type

`NodeMaterialization`

__materialize(*node*, *materialization_store*, *desperate*)

Parameters

- **node** (`Node`)
- **materialization_store** (`dict`)
- **desperate** (`bool`)

Return type

`None`

__erroneous_nodes(*old_erroneous_nodes*)

exception `annize.project.materializer.core.InternalError`

Bases: `Exception`

exception `annize.project.materializer.core.ChildrenNotMaterializableError`(*node*)

Bases: `InternalError`

Parameters

node (`Node`)

annize.project.materializer.object_factory module

Creation of objects. See [create_object\(\)](#).

class annize.project.materializer.object_factory._CreateObjectHelper

Bases: object

static [create_object](#)(*of_type*, *args*, *kwargs*)

Parameters

- **of_type** (*type*)
- **args** (*Iterable*)
- **kwargs** (*dict*)

static [_CreateObjectHelper__fill_empty_lists](#)(*parameter_info*, *args*, *kwargs*)

static [_CreateObjectHelper__fill_unspecified_optionals](#)(*parameter_info*, *args*, *kwargs*)

static [_CreateObjectHelper__put_item_into_kwargs](#)(*arg*, *kwargs*, *kwarg_name*, *param_type_info*)

static [_CreateObjectHelper__shift_args_to_kwargs](#)(*of_type*, *inspector*, *args*, *kwargs*)

annize.project.materializer.object_factory.[create_object](#)(*of_type*, *args*, *kwargs*)

Parameters

- **of_type** (*type*)
- **args** (*Iterable*)
- **kwargs** (*dict*)

exception annize.project.materializer.object_factory.[MultipleValuesForSingleArgumentError](#)(*arg_name*)

Bases: [TypeError](#)

Parameters

arg_name (*str*)

annize.project.materializer.preprocessors module

Some preprocessor functions used by the materializer.

Only used internally by the parent package.

annize.project.materializer.preprocessors.[resolve_appendtonodes](#)(*topnode*)

Parameters

topnode ([Node](#))

Return type

[Node](#)

Submodules

annize.project.feature_loader module

Feature module loader.

See [FeatureLoader](#).

```
class annize.project.feature_loader.FeatureLoader
```

Bases: ABC

Base class for a Feature module loader.

```
abstractmethod load_feature(name)
```

Parameters

name (*str*)

Return type

Any | None

```
abstractmethod get_all_available_feature_names()
```

Return type

list[str]

```
_abc_impl = <_abc._abc_data object>
```

```
class annize.project.feature_loader.DefaultFeatureLoader
```

Bases: [FeatureLoader](#)

Default Feature module loader.

```
_FEATURES_NAMESPACE = 'annize.features'
```

```
_COMMON_NAMESPACE_POSTFIX = 'common'
```

```
load_feature(name)
```

```
get_all_available_feature_names()
```

```
__find_feature_modules_in_package(package_name)
```

Parameters

package_name (*str*)

Return type

list[str]

```
_abc_impl = <_abc._abc_data object>
```

annize.project.inspector module

Project inspector.

See [FullInspector](#).

```
class annize.project.inspector.BasicInspector
```

Bases: object

Project inspectors are used in order to get various additional metadata about parts of a project, which are needed e.g. for project parsing and materialization or project configuration UIs.

This inspector type has restricted functionality, but has no dependencies and so is simple to instantiate. See also [FullInspector](#).

```
type_info(for_type)
```

Return basic type information for a given type, e.g. whether it is a scalar or list and whether it is optional.

Parameters

for_type (*type*) – The type to gather information for.

Return type
`TypeInfo`

`parameter_info(for_type)`

For a given type, return a mapping with type information for each of its constructor's keyword parameters. If it has a parameter for variable keyword arguments, it assumes that these refer to parameters of a superclass constructor and inspects them as well.

It will always contain each keyword parameter, even the ones without type annotation.

For some special types, like `enum.Enum` subclasses, it returns a different mapping, which the materializer will understand when instantiating these objects!

Parameters

`for_type` (`Callable`) – The type to gather constructor parameter information for.

Return type

`Mapping[str, TypeInfo]`

`all_named_nodes(root_node)`

Return all nodes that have a name assigned in a tree of nodes given by its root node.

Parameters

`root_node` (`Node`) – The root node. For the entire project, use its project node.

Return type

`Sequence[ArgumentNode]`

`node_by_name(name, root_node)`

Return the node with the given name in a tree of nodes given by its root node (or none).

Parameters

- **`name`** (`str`) – The node name.
- **`root_node`** (`Node`) – The root node. For the entire project, use its project node.

Return type

`Node | None`

`resolve_reference_node(node, *, deep=True)`

For a given argument node, resolve it if it is a reference node, or return the node itself otherwise. Return `None` if it cannot be resolved.

Parameters

- **`node`** (`ArgumentNode`) – The node to resolve.
- **`deep`** (`bool`) – Whether to deeply resolve it until a non-reference node is reached (instead of only resolving a single step at most).

Return type

`ArgumentNode | None`

`possible_argument_names_for_child_in_parent(child_type, parent_type)`

Return the list of possible argument names that a child with a given type can have in a parent with a given type, according to the parent's `parameter_info()`.

In the context of Annize objects, this list is only useful for children without an `arg_name`, in order to determine it automatically. The first argument name in that list is the preferred one by convention (this is e.g. what the project materializer does). The list will also never contain argument names that are marked as “explicit only” in the parent implementation.

See also [`possible_argument_infos_for_child_in_parent\(\)`](#).

Parameters

- **child_type** (*type*) – The child type.
- **parent_type** (*type*) – The parent type.

Return type

Sequence[*str*]

possible_argument_infos_for_child_in_parent(*child_type*, *parent_type*)

Similar to [`possible_argument_names_for_child_in_parent\(\)`](#), but also returns the type info for each possible argument name.

Parameters

- **child_type** (*type*) – The child type.
- **parent_type** (*type*) – The parent type.

Return type

Sequence[*tuple*[*str*, *TypeInfo*]]

type_documentation(*type_*, *, *with_parameters=False*)

Return documentation text for a given type. Parts of it might be in the current i18n culture, but most of it will be in English or whatever language was used in the docstrings.

Parameters

- **type** – The type.
- **with_parameters** (*bool*) – Whether to include documentation for its constructor parameters as well.
- **type_** (*type*)

Return type

str

_possible_argument_names_for_child_in_parent(*child_type*, *parent_type*, *parent_parameter_info*)

Parameters

- **child_type** (*type*)
- **parent_type** (*type*)
- **parent_parameter_info** (*Mapping*[*str*, *TypeInfo*])

Return type

Sequence[*str*]

__type_info(*for_type*, *as_optional=False*)

Parameters

- **for_type** (*type*)
- **as_optional** (*bool*)

Return type

TypeInfo

```
__type_documentation__summary()

    Parameters
        type_doc (str)

    Return type
        str

__type_documentation__parameter(param_name)

    Parameters
        • type_ (type)
        • param_name (str)

    Return type
        str

__type_documentation__parameter_block(param_name)

    Parameters
        • func_doc (str)
        • param_name (str)

    Return type
        Sequence[str]

__type_documentation__parameter_from_lines()

    Parameters
        param_doc_lines (Sequence[str])

    Return type
        str

class TypeInfo
    Bases: ABC
    abstract property name: str
    abstract property type: type | None
    abstract property is_optional: bool
    abstract property allows_multiple_args: bool
    abstract property inner_type_info: TypeInfo | None
    abstractmethod matches_type(type_)
        Parameters
            type_ (type)
        Return type
            bool
    abstractmethod matches_inner_type(type_)
        Parameters
            type_ (type)
        Return type
            bool
```



```

    _abc_impl = <_abc._abc_data object>

class _ScalarTypeInfo(name, type_, is_optional)
    Bases: TypeInfo
        Parameters
            • name (str)
            • type_ (type | None)
            • is_optional (bool)
        property name
        property type
        matches_type(type_)
        matches_inner_type(type_)
        property is_optional
        property inner_type_info
        property allows_multiple_args
    _abc_impl = <_abc._abc_data object>

class _ListTypeInfo(name, is_optional, inner_type_info)
    Bases: \_ScalarTypeInfo
        Parameters
            • name (str)
            • is_optional (bool)
        property allows_multiple_args
        property inner_type_info
    _abc_impl = <_abc._abc_data object>

class _UnionTypeInfo(name, is_optional, union_member_type_infos)
    Bases: \_ScalarTypeInfo
        Parameters
            • name (str)
            • is_optional (bool)
        matches_type(type_)
    _abc_impl = <_abc._abc_data object>

class annize.project.inspector.FullInspector(*, feature_loader=None)
    Bases: BasicInspector

    Project inspectors are used in order to get various additional metadata about parts of a project, which are needed
    e.g. for project parsing and materialization or project configuration UIs.

    This inspector type has full functionality, but has dependencies. See also BasicInspector.

```

Parameters

feature_loader ([FeatureLoader](#) / *None*) – The custom feature loader to use.

match_arguments(*node*)

For a given node, determine for each child node to which argument it matches, and return these argument matchings (taking care of type annotations and arguments' `arg_name`).

Whenever a child cannot be mapped to a particular argument, it is mapped to the "" argument. Whenever more than one argument name would be possible, the first one is taken.

Parameters

node ([Node](#)) – The node to check.

Return type

ArgumentMatchings

argument_type_for_argument_node(*node*)

For a given argument node, return its argument type, or *None* if it was unavailable. For reference nodes, it will resolve the reference and return *None* if it was unresolvable.

Parameters

node ([ArgumentNode](#)) – The argument node.

Return type

type | *None*

creatable_type_info(*for_type*)

Return creatable type information for a given type. This includes the functionality of `type_info()`, but it also includes information for turning it into an argument node.

Parameters

for_type (*type*) – The type to gather information for.

Return type

CreatableTypeInfo

creatables_for_node_argument(*node*, *parameter_name*)

For a given node and parameter name, return a list of all creatable infos that would be valid for this parameter.

Parameters

- **node** ([Node](#)) – The node.
- **parameter_name** (*str*) – The parameter name.

Return type

Sequence[[CreatableInfo](#)]

creatable_types_for_node_argument(*node*, *parameter_name*)

For a given node and parameter name, return a list of all creatable type infos that would be valid for this parameter.

This only returns a list of actual types. You probably should use `creatables_for_node_argument()` instead.

Parameters

- **node** ([Node](#)) – The node.
- **parameter_name** (*str*) – The parameter name.

Return type

Sequence[[CreatableTypeInfo](#)]

possible_reference_targets_for_node_argument(*node*, *parameter_name*)

For a given node and parameter name, return a list of all named nodes (so they can be referenced) that would be valid arguments for this parameter.

Parameters

- **node** (*Node*) – The node.
- **parameter_name** (*str*) – The parameter name.

Return type

Sequence[*ArgumentNode*]

possible_append_to_targets_for_node(*node*)

For a given node, return a list of all named nodes that would be valid `append_to` targets.

Parameters

node (*ArgumentNode*) – The node.

Return type

Sequence[*ArgumentNode*]

__all_creatable_types(*, *with_value_types=True*)

Parameters

with_value_types (*bool*)

Return type

Sequence[*CreatableTypeInfo*]

class ArgumentMatching(*arg_name*, *nodes*, *allows_multiple_args*)

Bases: *object*

Parameters

- **arg_name** (*str*)
- **nodes** (*Iterable*[*Node*])
- **allows_multiple_args** (*bool*)

property arg_name: *str*

property allows_multiple_args: *bool*

property nodes: *Sequence*[*Node*]

class ArgumentMatchings(*all_matchings*)

Bases: *object*

Parameters

all_matchings (*Iterable*[*FullInspector.ArgumentMatching*])

matching_by_arg_name(*arg_name*)

Parameters

arg_name (*str*)

Return type

ArgumentMatching | *None*

all()

Return type

Sequence[*ArgumentMatching*]

```
class CreatableTypeInfo(name, type_, is_optional, feature_name, type_short_name)
```

Bases: [_ScalarTypeInfo](#)

Parameters

- **feature_name** (*str* | *None*)
- **type_short_name** (*str*)

property feature_name: *str* | *None*

property type_short_name: *str*

_abc_impl = *<_abc._abc_data object>*

```
class CreatableInfo(type_info, name, kwargs)
```

Bases: *object*

Parameters

- **type_info** ([FullInspector.CreatableTypeInfo](#))
- **name** (*str*)

property type_info: [CreatableTypeInfo](#)

property name: *str*

property kwargs

annize.project.loader module

Loading Annize projects from disk.

See also [load_project\(\)](#).

```
annize.project.loader.load_project(project_location, *, inspector=None)
```

Load a project from disk. Return *None* if the given path does not lead to a location inside an Annize project.

Do not use it directly. See [annize.project.load\(\)](#).

Parameters

- **project_location** (*str* | *Path*) – A path to somewhere inside an Annize project.
- **inspector** ([FullInspector](#) | *None*) – The custom project inspector to use.

Return type

[ProjectNode](#) | *None*

```
annize.project.loader.project_annize_config_main_file(project_location)
```

Return the main configuration file for an Annize project given by a path (the path may point to somewhere inside the project; not only inside the Annize configuration directory), or *None* if the given path does not lead to a location inside an Annize project.

This is a file with a name like `project.xml`.

Parameters

project_location (*str* | *Path*) – A location somewhere inside the Annize project.

Return type

Path | *None*

`annize.project.loader.project_annize_config_directory(project_location)`

Return the configuration directory for an Annize project given by a path (the path may point to somewhere inside the project; not only inside the Annize configuration directory), or `None` if the given path does not lead to a location inside an Annize project.

This is a directory with a name like `-meta` (or another name in `ANNIZE_CONFIGURATION_DIRECTORY_NAMES`).

Parameters

project_location (*str* / *Path*) – A location somewhere inside the Annize project.

Return type

Path | `None`

`annize.project.loader.project_root_directory(project_location)`

Return the project root directory for an Annize project given by a path (the path may point to somewhere inside the project; not only inside the Annize configuration directory), or `None` if the given path does not lead to a location inside an Annize project.

This is a directory with a subdirectory like `-meta` (or another name in `ANNIZE_CONFIGURATION_DIRECTORY_NAMES`).

Parameters

project_location (*str* / *Path*) – A location somewhere inside the Annize project.

Return type

Path | `None`

`annize.project.loader.is_valid_annize_configuration_file_name(name)`

Return whether a given name is a valid Annize configuration file name.

Parameters

name (*str*) – The file name to check.

Return type

`bool`

annize.ui package

`annize.ui.app(app_name, **kwargs)`

Parameters

app_name (*str*)

Subpackages

annize.ui.apps package

Subpackages

annize.ui.apps.runner package

Subpackages

annize.ui.apps.runner.models package

Submodules

annize.ui.apps.runner.models.main module

`annize.ui.apps.runner.models.task_chooser` module

`annize.ui.apps.runner.models.task_execution` module

`annize.ui.apps.runner.models.user_feedback` module

`annize.ui.apps.runner.views` package

Submodules

`annize.ui.apps.runner.views.main` module

`annize.ui.apps.runner.views.task_chooser` module

`annize.ui.apps.runner.views.task_execution` module

`annize.ui.apps.runner.views.user_feedback` module

`annize.ui.apps.studio` package

Subpackages

`annize.ui.apps.studio.models` package

Submodules

`annize.ui.apps.studio.models.add_child` module

`annize.ui.apps.studio.models.choose_reference_target` module

`annize.ui.apps.studio.models.main` module

`annize.ui.apps.studio.models.main_tab_panel` module

`annize.ui.apps.studio.models.object_editor` module

`annize.ui.apps.studio.models.object_help` module

`annize.ui.apps.studio.models.problems_list` module

`annize.ui.apps.studio.models.project_config` module

`annize.ui.apps.studio.views` package

Submodules

`annize.ui.apps.studio.views.add_child` module

`annize.ui.apps.studio.views.choose_reference_target` module

`annize.ui.apps.studio.views.main` module

`annize.ui.apps.studio.views.main_tab_panel` module

`annize.ui.apps.studio.views.object_editor` module

`annize.ui.apps.studio.views.object_help` module

annize.ui.apps.studio.views.problems_list module

annize.ui.apps.studio.views.project_config module

annize.user_feedback package

class annize.user_feedback.UserFeedbackController

Bases: ABC

abstractmethod message_dialog(*message, answers, config_key*)

Parameters

- **message** (*str*)
- **answers** (*list[str]*)
- **config_key** (*str | None*)

Return type

int

abstractmethod input_dialog(*question, suggested_answer, config_key*)

Parameters

- **question** (*str*)
- **suggested_answer** (*str*)
- **config_key** (*str | None*)

Return type

str | None

abstractmethod choice_dialog(*question, choices, config_key*)

Parameters

- **question** (*str*)
- **choices** (*list[str]*)
- **config_key** (*str | None*)

Return type

int | None

_abc_impl = <_abc._abc_data object>

class annize.user_feedback.NullUserFeedbackController

Bases: object

message_dialog(*_)

input_dialog(*_)

choice_dialog(*_)

exception annize.user_feedback.UnsatisfiableUserFeedbackAttemptError

Bases: RuntimeError

`annize.user_feedback._controllers_tuples_for_context(context)`

Parameters

context (`RunContext`)

Return type

`Sequence[tuple[int, UserFeedbackController]]`

`annize.user_feedback._controllers_for_context(context)`

Parameters

context (`RunContext`)

Return type

`list[UserFeedbackController]`

`annize.user_feedback._add_controller_to_context(*, controller, context, priority_index=0)`

Parameters

- **controller** (`UserFeedbackController`)
- **context** (`RunContext`)
- **priority_index** (`int`)

Return type

`None`

`annize.user_feedback.message_dialog(message, answers, *, config_key=None)`

Parameters

- **message** (`TrStr` | `str`)
- **answers** (`Iterable[TrStr | str]`)
- **config_key** (`str` | `None`)

Return type

`int`

`annize.user_feedback.input_dialog(message, *, suggested_answer, config_key=None)`

Parameters

- **message** (`TrStr` | `str`)
- **suggested_answer** (`TrStr` | `str`)
- **config_key** (`str` | `None`)

Return type

`str` | `None`

`annize.user_feedback.choice_dialog(message, choices, *, config_key=None)`

Parameters

- **message** (`TrStr` | `str`)
- **choices** (`Iterable[TrStr | str]`)
- **config_key** (`str` | `None`)

Return type

`int` | `None`

Submodules

annize.user_feedback.static module

class annize.user_feedback.static.StaticUserFeedbackController(*answers*)

Bases: *UserFeedbackController*

Parameters

answers (*dict[str, Any]*)

add_answer(*config_key, value*)

Parameters

- **config_key** (*str*)
- **value** (*Any*)

Return type

None

__get_answer(*config_key*)

Parameters

config_key (*str*)

Return type

Any

message_dialog(*message, answers, config_key*)

input_dialog(*question, suggested_answer, config_key*)

choice_dialog(*question, choices, config_key*)

_abc_impl = *<_abc._abc_data object>*

6.1.2 Submodules

6.1.3 annize.annize_cli module

The Annize CLI.

annize.annize_cli.main()

annize.annize_cli.parser(**, only_documentation=True*)

Parameters

only_documentation (*bool*)

Return type

ArgumentParser

class annize.annize_cli.Commands(*project, with_answers_from_json_file, with_answers_from_json_string, with_answer, **_*)

Bases: *object*

Parameters

- **project** (*str*)
- **with_answers_from_json_file** (*Iterable[str]*)

- `with_answers_from_json_string (Iterable[str])`
- `with_answer (Iterable[Tuple[str, str]])`

`__initial_cwd = '/home/pino/projects/annize'`

`classmethod __answers_from_json_files(destination, with_answers_from_json_files)`

Parameters

- `destination (dict)`
- `with_answers_from_json_files (Iterable[str])`

`classmethod __answers_from_json_strings(destination, with_answers_from_json_strings)`

Parameters

- `destination (dict)`
- `with_answers_from_json_strings (Iterable[str])`

`classmethod __answers_from_single_answers(destination, with_answers)`

Parameters

- `destination (dict)`
- `with_answers (Iterable[Tuple[str, str]])`

`do(task_name, **_)`

Parameters

`task_name (str)`

`studio(**_)`

`annize.annize_cli._setup_logging(*, debug=False)`

Parameters

`debug (bool)`

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