CERTORA

Sphinx showcase

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Contents:

This chapter describes the most useful Sphinx directives and roles.

If you're markdown files (`.md`) – these use the MyST package, and the MyST examples are what you need. Those using reStructuredText filed (`.rst`) should refer to the reStructuredText examples.

For additional information see:

- reStructuredText Primer
- Sphinx Directives
- MyST

1 Standard markup

1.1 Basic inline markup

Fonts

MyST (.md)

```
* We can use _italic_ and *bold*.
* We can even have a `mono font`.
```

reStructuredText (.rst)

```
* We can use *italic* and **bold**.
* We can even have a ``mono font``.
```

Rendered as:

- We can use *italic* and **bold**.
- We can even have a `mono font`.

Headings

MyST (.md)

Listing 1: Headings conventions

```
# Top level

## Second level

### Third level
```

reStructuredText (.rst)

For a full list and explanation, see: reStructuredText Sections. Note there are no levels assigned to particular heading characters. Sphinx deduces the levels in each `.rst` file.

Listing 2: Headings conventions

```
Section heading
===============

Sub-section
-----------

Sub sub-section
^^^^^^^^^^^^^^^

Even lower level
""""""""""""""""
```

Horizontal rule

Use four dashes `----` (with empty lines above and below) to get a horizontal rule like the one below.

1.2 Lists

Bullet lists

```
* Bullet item
* Can contain nested lists

  * Like this
  * And this
```

Rendered as:

- Bullet item
- Can contain nested lists
  - Like this
  - And this

Numbered lists

MyST (.md)

```
1. Numbered list
2. Second item
```

reStructuredText (.rst)

```
#. Numbered list
#. Second item
```

Rendered as:

1. Numbered list
2. Second item

Definition list

MyST (.md)

```
Some term
: Followed by definition of the term, which must be indented.

  The definition can even consist of multiple paragraphs.

Second term
: Description of the second term.
```

reStructuredText (.rst)

```
Some term
   Followed by definition of the term, which must be indented.

   The definition can even consist of multiple paragraphs.

Second term
   Description of the second term.
```

Rendered as:

Some term
: Followed by definition of the term, which must be indented.

  The definition can even consist of multiple paragraphs.

Second term
: Description of the second term.

1.3 Links

External links

MyST (.md)

```
* Simple external link: [Certora](https://www.certora.com/).
* Using predefined link: [Rick Astley][RickRolled] (defined below)

[RickRolled]: https://www.youtube.com/watch?v=dQw4w9WgXcQ
```

reStructuredText (.rst)

```
* Simple external link: `Certora <https://www.certora.com/>`_.
* Using predefined link: `Rick Astley`_ (defined below)

.. _Rick Astley: https://www.youtube.com/watch?v=dQw4w9WgXcQ
```

Rendered as:

- Simple external link: Certora.
- Using predefined link: Rick Astley (defined below)

Embedding a Youtube video

MyST (.md)

~~~
```{youtube} VGSsPIsbb6U
:align: center
```
~~~

reStructuredText (.rst)

```
.. youtube:: VGSsPIsbb6U
   :align: center
```

Rendered as:

https://youtu.be/VGSsPIsbb6U

Internal links

Link anywhere inside the documentation.

MyST (.md)

See MyST Cross-referencing.

reStructuredText (.rst)

```
.. _my-reference-label:

Cross-reference inside documentation
""""""""""""""""""""""""""""""""""""


Set up a label ``.. _my-reference-label`` as shown above.
Note underscore prefix in the label name.

To reference use the ``:ref:`` directive like so: :ref:`my-reference-label`.
```

Link to code file on Github

Link to a code file using the `:clink:` role. The link will be either to GitHub or to local file, depending on the value of `link_to_github` variable in the `source/conf.py` file.

Path resolution

- Relative paths will be considered as relative to the current file (the file containing the `:clink:` role).
- Absolute paths will either:
  1. Be considered as relative to the source folder, i.e. the folder containing the `conf.py` file – if the code_path_variable has not been used.
  2. Be considered as relative to the code_path_variable, if it has been set.
- A path starting with `@` will be resolved according to the path_remappings_dict. For example, suppose `path_remappings` is set in the `conf.py` file as:

  Listing 3: conf.py

  ```
  path_remappings = {"@voting": "../../../code/voting"}
  ```

  Then a link such as:

  ```
  For example :clink:`Voting solution spec <@voting/Voting_solution.spec>`.
  ```

  Will be resolved as `../../code/voting/Voting_solution.spec` *relative to the source directory*.

Syntax

The basic syntax is:

MyST (.md)

Listing 4: Syntax

```
{clink}`Optional name <relative-path-to-code-file>`
{clink}`Optional name <absolute path relative to absolute code path>`
{clink}`Optional name <@remapping-key/path relative to remapping>`
```

reStructuredText (.rst)

Listing 5: Syntax

```
:clink:`Optional name <relative-path-to-code-file>`
:clink:`Optional name <absolute path relative to absolute code path>`
:clink:`Optional name <@remapping-key/path relative to remapping>`
```

For example:

MyST (.md)

```
* Reference to a folder: {clink}`Voting folder </voting>` using the `code_path_
↪override`
* Reference to a file: {clink}`Voting_solution.spec </voting/Voting_solution.spec>`
* Reference using the remapping: {clink}`Optional name <@voting/Voting_solution.spec>`
* Reference without text: {clink}`/voting/Voting_solution.spec`
```

reStructuredText (.rst)

```
* Reference to a folder: :clink:`Voting folder </voting>` using the ``code_path_
↪override``
* Reference to a file: :clink:`Voting_solution.spec </voting/Voting_solution.spec>`
* Reference using the remapping: :clink:`Optional name <@voting/Voting_solution.spec>`
* Reference without text: :clink:`/voting/Voting_solution.spec`
```

Rendered as:

- Reference to a folder: Voting folder using the `code_path_override`
- Reference to a file: Voting_solution.spec
- Reference using the remapping: Optional name
- Reference without text: /voting/Voting_solution.spec

2 Code blocks

2.1 Best practice

It is best to include a code-block from a spec or Solidity file that is part of a regtest. This will ensure that you will be alerted if there are any breaking changes. Use the directives described in *From external file*.

Including source code for CVL elements using the `includecvl` directive (see *Including CVL elements* below) has the added benefit that it is protected against changes to the code file itself. Added or removed lines will not affect it.

2.2 In-place code

Code-block

You can insert a *CVL* code block in-place, using the `code-block` directive, as shown below. The same directive can be used for other languages, such as Solidity.

MyST (.md)

~~~
```{code-block} cvl

   methods {
       function balanceOf(address) external returns (uint256) envfree;
   }

   rule testBalance(address user) {
       assert balanceOf(user) > 0;
   }
```
~~~

reStructuredText (.rst)

```
.. code-block:: cvl

   methods {
       function balanceOf(address) external returns (uint256) envfree;
   }

   rule testBalance(address user) {
       assert balanceOf(user) > 0;
   }
```

Rendered as:

```
methods {
    function balanceOf(address) external returns (uint256) envfree;
}

rule testBalance(address user) {
    assert balanceOf(user) > 0;
}
```

Additional features, such as line numbers and emphasized lines are demonstrated below. You can find all the options available at: code-block directive.

MyST (.md)

~~~
```{code-block} cvl
:linenos:
:lineno-start: 7
:emphasize-lines: 10,17
:caption: CVL2 code example

methods
{
    function DataWarehouse.getRegisteredSlot(
        bytes32 blockHash,
        address account,
        bytes32 slot
    ) external returns (uint256) => _getRegisteredSlot(blockHash, account, slot);
}

ghost mapping(address => uint256) _exchangeRateSlotValue;

function _getRegisteredSlot(
    bytes32 blockHash,
    address account,
    bytes32 slot
) returns uint256 {
    return _exchangeRateSlotValue[account];
}
```
~~~

reStructuredText (.rst)

```
.. code-block:: cvl
   :linenos:
   :lineno-start: 7
   :emphasize-lines: 10,17
   :caption: CVL2 code example

   methods
   {
       function DataWarehouse.getRegisteredSlot(
           bytes32 blockHash,
           address account,
           bytes32 slot
       ) external returns (uint256) => _getRegisteredSlot(blockHash, account, slot);
   }

   ghost mapping(address => uint256) _exchangeRateSlotValue;

   function _getRegisteredSlot(
       bytes32 blockHash,
       address account,
       bytes32 slot
   ) returns uint256 {
       return _exchangeRateSlotValue[account];
   }
```

Rendered as:

Listing 6: CVL2 code example

```
methods
{
    function DataWarehouse.getRegisteredSlot(
        bytes32 blockHash,
        address account,
        bytes32 slot
    ) external returns (uint256) => _getRegisteredSlot(blockHash, account, slot);
}

ghost mapping(address => uint256) _exchangeRateSlotValue;

function _getRegisteredSlot(
    bytes32 blockHash,
    address account,
    bytes32 slot
) returns uint256 {
    return _exchangeRateSlotValue[account];
}
```

Inline CVL and solidity

MyST (.md)

You can add inline *CVL* code using the `:cvl:` role, and inline Solidity using the `:solidity:` role. To do so you must first define these roles at the top of your `.md` file, like so:

~~~
```{role} cvl(code)
:language: cvl
```

```{role} solidity(code)
:language: solidity
```
~~~

Now we can use them, as in the following example:

```
Type casting between integers in *CVL* has two different forms,
{cvl}`assert_uint256` and {cvl}`require_uint256`.
In the {solidity}`constructor(uin256 x)` ...
```

reStructuredText (.rst)

You can add inline *CVL* code using the `:cvl:` role, and inline Solidity using the `:solidity:` role. These roles are defined in the `conf.py` file. For example, the following paragraph:

```
Type casting between integers in *CVL* has two different forms,
:cvl:`assert_uint256` and :cvl:`require_uint256`. In the
:solidity:`constructor(uin256 x)` ...
```

Rendered as:

Type casting between integers in *CVL* has two different forms, `assert_uint256` and `require_uint256`. In the `constructor(uin256 x)` …

2.3 From external file

Use the `cvlinclude` directive to include code snippets from files.

Syntax

```
.. cvlinclude:: path-to-file, see below
   :language: language (optional), see below
   :cvlobject: cvl objects to show, available only for spec files, see below
   :spacing: <spacing-number>
   :caption: caption (optional), see below
   :lines: line-numbers of the snippet (optional)
   :start-at: optional string marking the first line of included code
   :start-after: optional string, the first line of the code starts after
   :end-at: optional string marking the last line of included code
   :end-before: optional string, the last line of the included code is before this
```

path-to-file
The path to the file containing the code snippet. The path is resolved according to the same *Path resolution* used for the `:clink:` role.

language
This is not needed for paths with suffixes `.spec`, `.sol` or `.conf`. For these the appropriate language (i.e. CVL, Solidity and Json) will be used by default. See `file_suffix_to_language`.

cvlobject
See *Including CVL elements* below.

spacing-number
The number of lines between two CVL elements. Applicable only to spec files and directives using the `:cvlobject:` option. Defaults to one.

caption
If an empty caption is provided, the directive will use the default caption, which is a code link to the file displaying the file's name, i.e.:

```
:clink:`file-name <path-to-file>`
```

Note

In addition `cvlinclude` supports all options supported by `literalinclude`, see literalinclude directive.

Including CVL elements

Use the `cvlinclude` directive to include CVL elements *by name*. This is the preferred way to include rules, invariants, ghosts and the methods block. Complete documentation is available at includecvl_extension.

Example

MyST (.md)

~~~
```{cvlinclude} ../../../../code/voting/Voting_solution.spec
:cvlobject: numVoted onlyLegalVotedChanges sumResultsEqualsTotalVotes
:caption: Voting rules
~~~

reStructuredText (.rst)

```
.. cvlinclude:: ../../../../code/voting/Voting_solution.spec
   :cvlobject: numVoted onlyLegalVotedChanges sumResultsEqualsTotalVotes
   :caption: Voting rules
```

Rendered as:

Listing 7: Voting rules

```
/// @title Count the number of times `_hasVoted` been written to
ghost mathint numVoted {
    init_state axiom numVoted == 0;
}

/// @title No illegal changes to `_hasVoted`
invariant onlyLegalVotedChanges()
    !illegalStore;

/// @title Sum of voter in favor and against equals total number of voted
invariant sumResultsEqualsTotalVotes()
    votesInFavor() + votesAgainst() == to_mathint(totalVotes());
```

- If the path to the spec file is absolute, it is considered as relative to the `/source/` directory.
- The `:cvlobject:` option accepts names of CVL elements (rule, invariant and ghosts). To include the `methods` block, add `methods` to these names. The elements will be shown in the order they are given.

Note

Hooks are not supported (since they are not supported by the `CVLDoc` package). Use `literalinclude` below.

Other Examples

MyST (.md)

~~~
```{cvlinclude} @voting/Voting.sol
:lines: 4-
:emphasize-lines: 5-7
:caption:
```
~~~

reStructuredText (.rst)

```
.. cvlinclude:: @voting/Voting.sol
   :lines: 4-
   :emphasize-lines: 5-7
   :caption:
```

Rendered as:

Listing 8: Voting.sol

```
contract Voting {

  mapping(address => bool) internal _hasVoted;

  uint256 public votesInFavor;
  uint256 public votesAgainst;
  uint256 public totalVotes;

  function vote(bool isInFavor) public {
    require(!_hasVoted[msg.sender]);
    _hasVoted[msg.sender] = true;

    totalVotes += 1;
    if (isInFavor) {
      votesInFavor += 1;
    } else {
      votesAgainst += 1;
    }
  }

  function hasVoted(address voter) public view returns (bool) {
    return _hasVoted[voter];
  }
}
```

3 Indexing and glossary

3.1 Indexing

To add terms to the genindex, place an appropriate `index` directive before the part you wish to index. See Sphinx - index directive for a comprehensive description of this directive, here are some simple examples.

Simple indexing

The following will create three index entries.

MyST (.md)

Todo

Test this one!

~~~
```{index} municipality, town, city
```
~~~

reStructuredText (.rst)

```
.. index:: municipality, town, city
```

Adding single values

MyST (.md)

~~~
```{eval-rst}
.. index::
   single: propositional logic
   single: logic; propositional
```
~~~

reStructuredText (.rst)

```
.. index::
   single: propositional logic
   single: logic; propositional
```

This will create two index entries, the first as “propositional logic” and the second will be a sub-index under “logic”.

Adding reference labels to indexes

Use the `:name:` option for adding a label that can be used with `:ref:`. For example:

MyST (.md)

~~~
```{eval-rst}
.. index::
   :name: intro_to_formal
```

## Introduction to formal verification

See {ref}`intro_to_formal` ...
~~~

reStructuredText (.rst)

```
.. index::
   :name: intro_to_formal

Introduction to formal verification
-----------------------------------

See :ref:`intro_to_formal` ...
```

Inline indexing

You can add index entries inline. Here is an example from Sphinx - index directive:

MyST (.md)

```
This is a normal MyST {index}`paragraph` that contains several
{index}`index entries <pair: index; entry>`.
```

reStructuredText (.rst)

```
This is a normal reST :index:`paragraph` that contains several
:index:`index entries <pair: index; entry>`.
```

3.2 Glossary

For complete documentation on the `glossary` directive see Sphinx - Glossary.

Creating a glossary

Create a glossary using the `glossary` directive, followed by a *Definition list* of the desired terms. A term can have several names, as shown in the following example.

MyST (.md)

~~~
{.glossary}
CVL
: The Certora Verification Language, used for writing specs for Solidity contracts.

```{glossary}
Prover
Certora Prover
: The tool used for verifying specs written in {term}`CVL`.
```
~~~

reStructuredText (.rst)

```
.. glossary::

   CVL
      The Certora Verification Language, used for writing specs for Solidity␣
↪contracts.

   Prover
   Certora Prover
      The tool used for verifying specs written in :term:`CVL`.
```

Rendered as:

CVL
The Certora Verification Language, used for writing specs for Solidity contracts.

Prover
Certora Prover
The tool used for verifying specs written in *CVL*.

Referencing a glossary term

Use the `term` role to refer to a glossary term, for example:

MyST (.md)

```
* Simple reference such as {term}`CVL`
* Showing alternative text like {term}`The Prover <Prover>`
```

reStructuredText (.rst)

```
* Simple reference such as :term:`CVL`
* Showing alternative text like :term:`The Prover <Prover>`
```

Rendered as:

- Simple reference such as *CVL*
- Showing alternative text like *The Prover*

4 Comments and TODOs

4.1 RestructuredText comments

```
.. This is a comment in RestructuredText, the entire paragraph will be ignored
   by sphinx. Just note the indentation.
```

4.2 Development build

We can have content that is visible only in *dev-build* mode. To enable dev-build mode, add `-t is_dev_build` to the `sphinx-build` command (see build_html and generating_pdf). For example:

```
sphinx-build -b html docs/source/ docs/build/html -t is_dev_build
```

Note

In dev-build the html title (on the side bar) will have "- Development" added to it. This behavior can be modified in the `/source/conf.py` file.

Contents for dev-build only

To produce contents that will appear only in dev-build, use the `.. only` directive, like this:

MyST (.md)

~~~
```{only} is_dev_build

The following will only be included in dev builds.
```
~~~

reStructuredText (.rst)

```
.. only:: is_dev_build

   The following will only be included in dev builds.
```

Rendered as:

The following will only be included in dev builds.

TODOs

TODO comments will only appear in dev-build. To add a TODO comment:

MyST (.md)

~~~
```{todo}
This is an example of a TODO comment, it can also have several paragraphs.
```
~~~

reStructuredText (.rst)

```
.. todo:: This is an example of a TODO comment, it can also have several paragraphs.
```

Rendered as:

Todo

This is an example of a TODO comment, it can also have several paragraphs.

To create a list containing all the TODO comments:

MyST (.md)

~~~
```{todolist}
```
~~~

reStructuredText (.rst)

```
.. todolist::
```

5 Admonitions

Admonitions are used for warnings, info and so on. Here is a collection of admonitions examples.

MyST (.md)

~~~
```{note}

For providing notes and information to the user.

The admonition can contain several paragraphs and also other elements, like:

* Lists
* Math
```

```{attention}
Pay attention.
```

```{important}
For marking very important things.
```

```{tip}
Tips for the reader.
```

```{hint}
~~~

(continues on next page)

(continued from previous page)

~~~
Provide hints.
```

```{warning}
Warn about dangerous things.
```

```{seealso}
For providing more references.
```

```{admonition} General admonition - any title you want
The freedom to admonish.
```
~~~

reStructuredText (.rst)

```
.. note::

   For providing notes and information to the user.

   The admonition can contain several paragraphs and also other elements, like:

   * Lists
   * Math

.. attention::

   Pay attention,

.. important::

   For marking very important things.

.. tip::

   Tips for the reader.

.. hint::

   Provide hints.

.. warning::

   Warn about dangerous things.

.. seealso::

   For providing more references.

.. admonition:: General admonition - any title you want

   The freedom to admonish.
```

Rendered as:

Note

For providing notes and information to the user.

The admonition can contain several paragraphs and also other elements, like:

- Lists
- Math

Attention

Pay attention,

Important

For marking very important things.

Tip

Tips for the reader.

Hint

Provide hints.

Warning

Warn about dangerous things.

See also

For providing more references.

General admonition - any title you want

The freedom to admonish.

6 Panels

The panels use the sphinx-design extension. Follow the link for more details.

6.1 Single card

MyST (.md)

~~~
```{card} Card Title

Content of the card. See
`sphinx-design <https://sphinx-design.readthedocs.io/en/rtd-theme/index.html>`_
for more details.
```
~~~

reStructuredText (.rst)

```
.. card:: Card Title

   Content of the card. See
   `sphinx-design <https://sphinx-design.readthedocs.io/en/rtd-theme/index.html>`_
   for more details.
```

Rendered as:

Card Title   Content of the card. See sphinx-design for more details.

6.2 Grid with two cards

MyST (.md)

~~~
````{grid} 2

```{grid-item-card}  Title 1

Left card
```

```{grid-item-card}  Title 2

Right card
```
````
~~~

reStructuredText (.rst)

```
.. grid:: 2

    .. grid-item-card::  Title 1

        Left card

    .. grid-item-card::  Title 2

        Right card
```

Rendered as:

Title 1   Left card

Title 2   Right card

Placing code side by side

Note the limited width of the columns!

Spec

Listing 9: Invariant

```
invariant totalIsBiggest(address user)
    balanceOf(user) <= totalBalance();
```

Solidity

Listing 10: Solidity

```
function balanceOf(
  address user
) external view returns (bool) {
  return _balances[user];
}
```

6.3 Drop-down

Drop-down content is useful for providing hidden hints. Here is a simple drop-down:

MyST (.md)

~~~
```{dropdown} Dropdown title
:animate: fade-in-slide-down

Dropdown content, for example an important hint.

See `sphinx-design - dropdowns
<https://sphinx-design.readthedocs.io/en/rtd-theme/dropdowns.html>`_ for more options.
```
~~~

reStructuredText (.rst)

```
.. dropdown:: Dropdown title
   :animate: fade-in-slide-down

    Dropdown content, for example an important hint.

    See `sphinx-design - dropdowns
    <https://sphinx-design.readthedocs.io/en/rtd-theme/dropdowns.html>`_ for more␣
↪options.
```

Rendered as:

Dropdown title

Dropdown content, for example an important hint.

See sphinx-design - dropdowns for more options.

7 Using Latex

7.1 In-line math

For inline math use the `:math:` role. For example:

MyST (.md)

```
Let {math}`\mathcal{C}` be the category of groups and {math}`f: G \to H` be a
morphism in {math}`\mathcal{C}`.
```

reStructuredText (.rst)

```
Let :math:`\mathcal{C}` be the category of groups and :math:`f: G \to H` be a
morphism in :math:`\mathcal{C}`.
```

Rendered as:

Let $\mathcal{C}$ be the category of groups and $f : G \to H$ be a morphism in $\mathcal{C}$.

7.2 Centered math

Use the `math` directive, as shown below. See Directives - math for additional options and examples.

MyST (.md)

~~~
```{math}
(a + b)^2  &=  (a + b)(a + b) \\
           &=  a^2 + 2ab + b^2
```
~~~

reStructuredText (.rst)

```
.. math::

   (a + b)^2  &=  (a + b)(a + b) \\
              &=  a^2 + 2ab + b^2
```

Rendered as:

$$\begin{aligned}(a+b)^2 &= (a+b)(a+b)\\ &= a^2+2ab+b^2\end{aligned}$$

7.3 Advanced use

Here is an example of showing a conditional function.

MyST (.md)

Listing 11: Conditional function in Latex

~~~
```{math}
:nowrap:

\begin{equation}
f(x) =
\begin{cases}
     0   & \text{if } x \leq 0 \\
     x^2 & \text{otherwise}
\end{cases}
\end{equation}
```
~~~

reStructuredText (.rst)

Listing 12: Conditional function in Latex

```
.. math::
   :nowrap:

   \begin{equation}
   f(x) =
   \begin{cases}
        0   & \text{if } x \leq 0 \\
        x^2 & \text{otherwise}
   \end{cases}
   \end{equation}
```

Rendered as:

$$f(x) = \begin{cases} 0 & \text{if } x \leq 0 \\ x^2 & \text{otherwise} \end{cases} \tag{1}$$

Note

When using the `.. math::` directive, Sphinx will wrap the latex code inside the Latex `split` environment before rendering it. Using the `:nowrap:` option disables this behavior.

For example, the code from *Centered math* is rendered as the following Latex code:

```
\begin{split}
    (a + b)^2  &=  (a + b)(a + b) \\
               &=  a^2 + 2ab + b^2
\end{split}
```

8 Miscellaneous

Attention

This section is currently only available for reStructuredText. See MyST Roles and Directives for how to use these directives in MyST.

8.1 Tables

There are several ways to add tables in reStructuredText, there are described in

- reStructuredText Primer - Tables
- CSV Tables
- List Tables

Here is an example of a *list table*.

```
.. list-table:: Table title
   :header-rows: 1

   * - Column Header
     - 2nd Column Header
     - 3rd Column Header

   * - Row 1 Column 1 item
     - Row 1 Column 2 item
     - An item

   * - An item
     - Row 2 Column 2 item
     - Row 2 Column 3 item
```

Rendered as:

Table 1: Table title

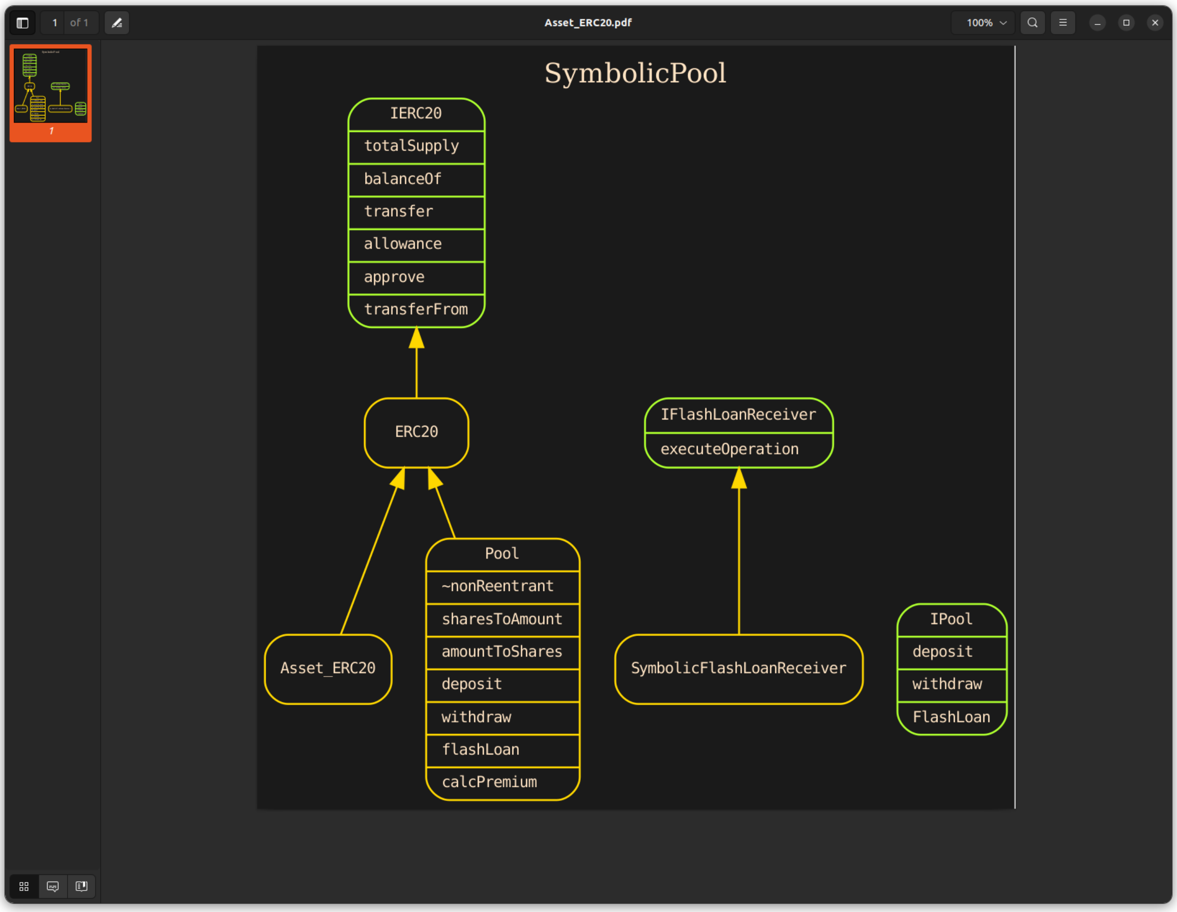
Column Header	2nd Column Header	3rd Column Header
Row 1 Column 1 item	Row 1 Column 2 item	An item
An item	Row 2 Column 2 item	Row 2 Column 3 item

8.2 Adding an image

To insert an image or picture use the `.. image` directive, as shown below. The specified path to the image `images/symbolic_pool_diagram.png` is relative to the file containing the directive.

```
.. image:: images/symbolic_pool_diagram.png
   :alt: This text will be displayed if the image is broken
```

Rendered as:



Notes

The image path
A relative path should be relative to the `.rst` file. An absolute path is treated as relative to the top `source/` directory. See Sphinx Image Directive for more on this.

Additional options
Options, such as alternative text for missing images and scaling, are described in Docutils Image Directive.

8.3 Adding a video clip

To add a video clip file we use the sphinxcontrib-video extension. Note that the preferred folder to place the video file is the `source/_static/` folder. For example:

```
.. video:: ../_static/lesson4_invariants/ball_game/InvariantsClip_subtitles.mp4
   :alt: The text shown when the video cannot be displayed
   :height: 250
```

Rendered as:

See also

See sphinxcontrib-video Quickstart for additional options.

Combining closed captions

You cannot use a separate file for the closed captions (subtitles). Instead you must embed the closed captions inside the video itself.

Here is one recipe to include a closed captions file in your video. Suppose you have an mp4 video `InvariantsClip.mp4` and a closed captions file named `InvariantsClip.srt`, you can combine them using the FFmpeg package with the following command:

```
ffmpeg -i InvariantsClip.mp4 -vf subtitles=InvariantsClip.srt InvariantsClip_
↪subtitles.mp4
```

Todo

Missing topics to add:

- table ot contents (mainly the `hidden` option)
- adding images and using the `only-light` and `only-dark` classes in furo
- tabs (from sphinx-design)
- footnotes
- `.. rubric`, `.. centered` and `.. hlist`

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