QGIS Python API Documentation report

Summary

Opengis.ch has been mandated by QGIS.org to realize a first generation of QGIS Python API Documentation. Here is a report of what has been done and what remains.

The accepted [offer](#) concerned following topics:
- Use Sphinx to build the QGIS python API doc
- Display full signature docstrings including all overloaded methods
- Support syntax in Doxygen for both C++ and Python code snippets and documentation
- Rename remaining single char function parameters in API methods (since parameter names are now part of the stable API)
- Documentation for sipify to help developers write good API documentation
- If there is time left: integrate Doxygen diagrams in documentation

Report

Sphinx documentation

QGIS Python API Documentation is created using Sphinx and this work is available on a github repo:
https://github.com/opengisch/QGISPythonAPIDocumentation.

The repo is a fork of [QGIS' one](#), which can be easily merged later on.

It uses a new theme (*sphinx_rtd_theme* aka ReadTheDocs theme). It also produces the docs in a a dedicated [branch](#) (*gh-pages*) which can be viewed on github [pages](#) at the moment.

Some improvements were brought in (not exhaustive):
- QGIS theming with colors and icon
- Foldable toctree
- Summary of methods and attributes for classes
- Module index (not available before)
- Correct display of overloaded methods

Full Python signature in Docstring

In former SIP versions, it was not possible to use the auto generated signature if a Docstring already existed. This means any documented method could not have a signature created. Unfortunately for this project, the vast majority of methods in QGIS API are documented!

The source code of SIP was modified and theses changes got merged upstream. See rev 1788 to 1793 in SIP changelog. It will be released in upcoming 4.19.7 version.

QGIS source code was modified accordingly to prepend auto generated Python signatures to existing Docstrings. Using a CMake configuration file for each module (core.sip.in, gui.sip.in, etc.) was required to avoid syntax errors when using former version of SIP (since bumping minimum version is not realistic).

Sipify adjustments

Many things were fixed in sipify script:
- Creation of links to classes, methods
- Handling/fixing of Doxygen annotations \see, \note, \param
- Handling of code snippets: c++ vs Python. Only Python are shown.

A reference to commits is appended in appendix 1.

Unachieved

Building the documentation rapidly revealed many errors in the sipify script. Many of them were fixed and this was an important load on the available time. Since worked hours went beyond the original proposal, following tasks were not completed:
- *Documentation for sipify to help developers write good API documentation*
- *If there is time left: integrate Doxygen diagrams in documentation*

Documentation remains to be done while integration of Doxygen diagrams is more seen as a nice to have.

Remaining issues

Sphinx issues:
- Summary lists inherited members leading to an overwhelmed list
- Documentation of classes constructor is missing

Python vs C++ parameters list

Currently the list of parameters is taken as-is from the C++ list regardless of differences due to using /Out/ annotations.

This leads to inappropriate parameters and returns lists in Python API Documentaiton. For instance, see QgsAbstractGeometry.closestSegment documentation.

Appendix 1: sipify related commits

880d853e9f	detect SIP version to add DefaultDocstringSignature directive (#6030)
d87c60512c	[sipify] fix bad handling of \see within sentences
9deef832c1	[sipify] fix SIP new restrictions on Docstrings
8a5d53325c	[doxygen] add test to ensure code snippet use \code command
5dc9b5869a	fix empty lines with spaces
bdfd345034	fix code descriptor
45315bbfd6	add cpp to code type
7b0ad1b6d5	fix code snippet and do not display cpp code in sip files
64c99e054c	run sipify for code snippets
d042304cc3	[sipify] habndle python code snippets
36a05a3a0d	do not create link for current class
db8a7c613b	[sipify] also create links in docstrings
b630a407b5	missing SIP_OUT
281392b103	[doxygen] fix badly placed \returns
e6f657cf81	add a test to check that returns are placed before since and note in Doxygen
92751d47e2	make sipfiles test macos compatible
cb9bd6d3da	fix missing new line before first param
8db419ca08	[sipify] avoid printing empty Docstrings
f811d8171b	remove rtype from docstring
2009d4c916	remove extra spaces
199055edbe	fix doxygen layout
bc51bba386	[sipify] transform \param xxx to :param xxx:
8fef9e9679	[sipify] place :rtype: at the correct place
906259b2f7	[doxygen] remove useless @brief
f29306d4af	[doxygen] replace @param by \param
b72c569cf3	[doxygen] replace @see by \see
ed5076201a	[doxygen] \see must be placed after params
53a86932d4	[sipify] creates links in seealso