

# Clang Code Standard Plugins

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This document shows the steps needed to install the tooling used in this project to enforce code standards.

## 1 Clean code (beautifier)

It is decided to use style tooling for formatting the C++ code. This is chosen so that developers don't need to worry about style issues.

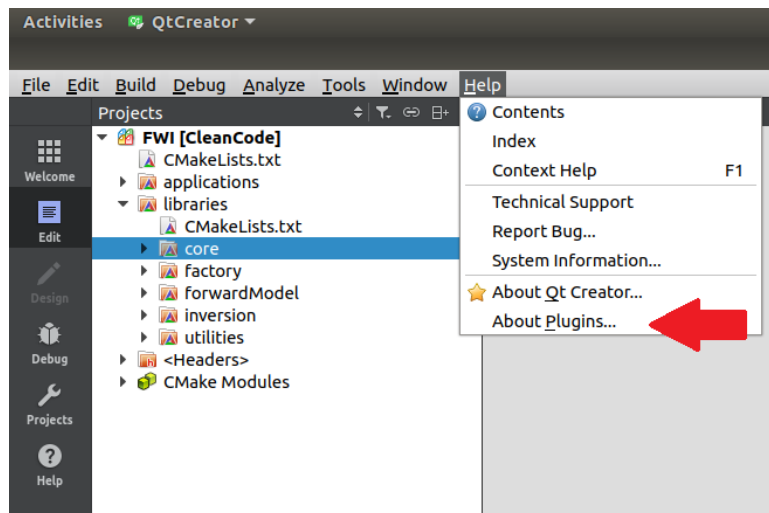
### Install Clang-Format

In Linux, open your **terminal**, and type in `sudo apt install clang-format`

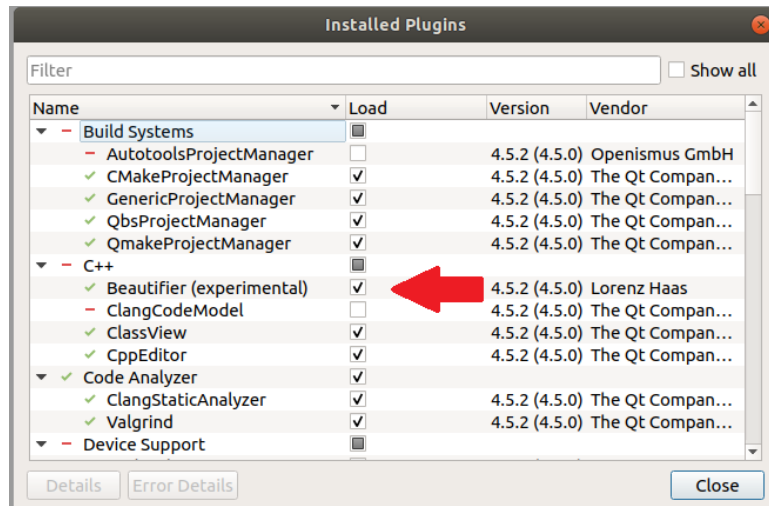
### Implementation for your IDE

#### A) Plugin in Qt Creator

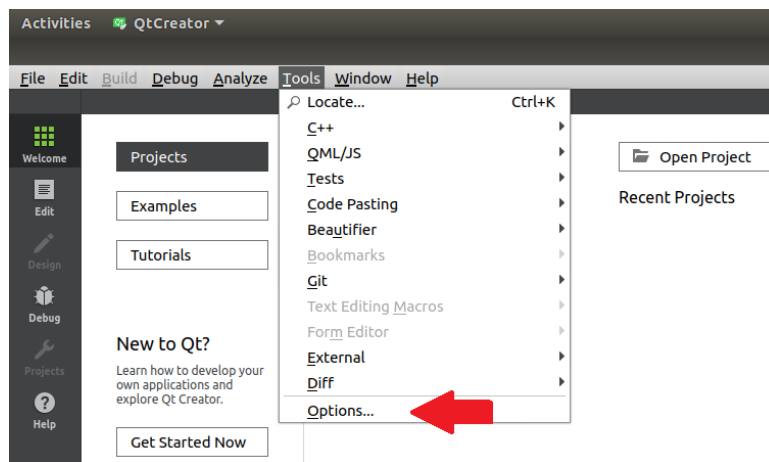
1. Open Qt Creator, go to **Help**, and select **About Plugins...**



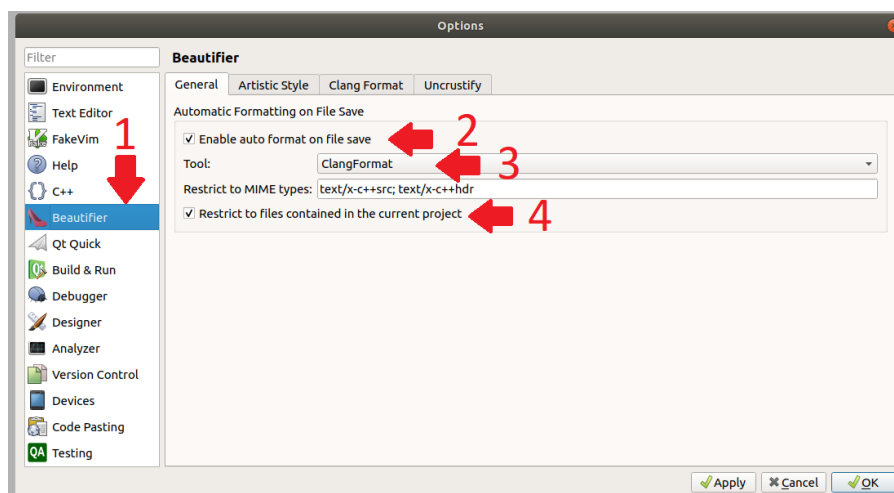
2. Select **Beautifier (experimental)** under C++, and close Qt Creator.



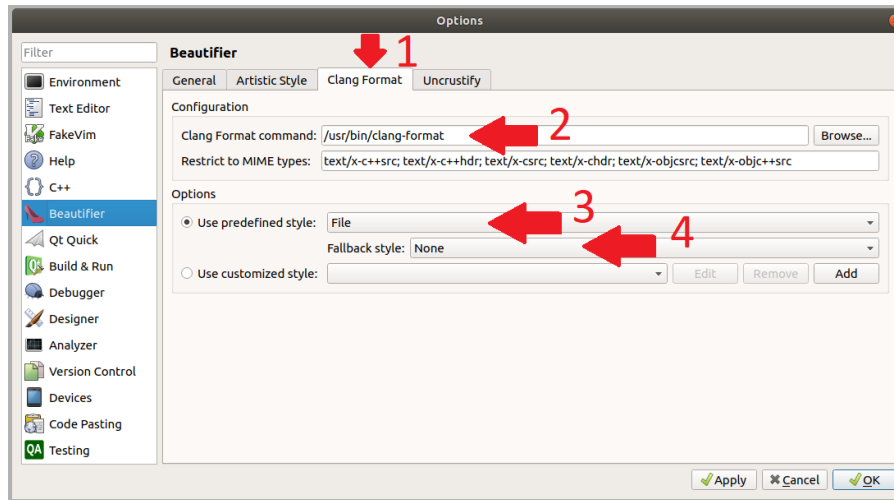
3. Open Qt Creator, go to **Tools**, and select **Options...**



4. In **Options** select **Beautifier** (1). In the **General** tab, check **Enable auto format on File Save** (2), select **ClangFormat** (3), and check **Restrict to files contained in the current project** (4).



5. In this window select tab **Clang Format** (1). Verify if **Clang Format command** (2) is correctly filled in. Select option **File** in **Use predefined style** (3) and select **None** as **Fallback style** (4). Note: Clang-Format automatically searches for the .clang-format file in the (parent) directory.



## B) CLang Format in other IDE's

In most IDE's a Clang-format plugin is available that works in a similar way as described above. It is important to select predefined style by file. Clang-Format will then automatically search the style format file.

## Change the style format

The style used by Clang-Format is implemented in the .clang-format file in the parallelized-fwi folder. This file has no name, and is thus simply called .clang-format. In Ubuntu it is a hidden file, but it can be shown by clicking **Ctrl + H**. Note: the version of Clang-Format is decisive for commands that can be used. Unfortunately, some commands had to be removed.

## 2 Code-standards (Naming & Good practice)

For the enforcing of code standards, clang-tidy is used, which gives IDE warnings when code-standard criteria are not met. These standards themselves are described in the CodeStandards documentation in this project (found in the README folder).

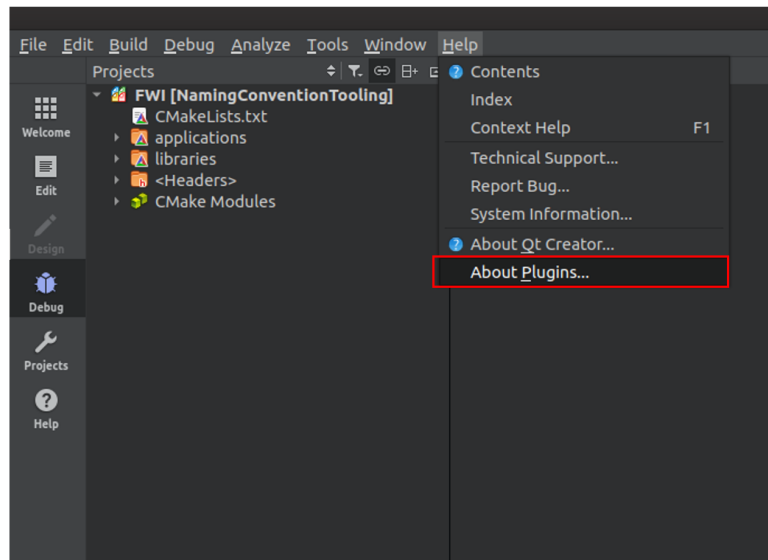
### Install clang-tidy

Run the following command in your Linux terminal: `sudo apt install clang-tidy`

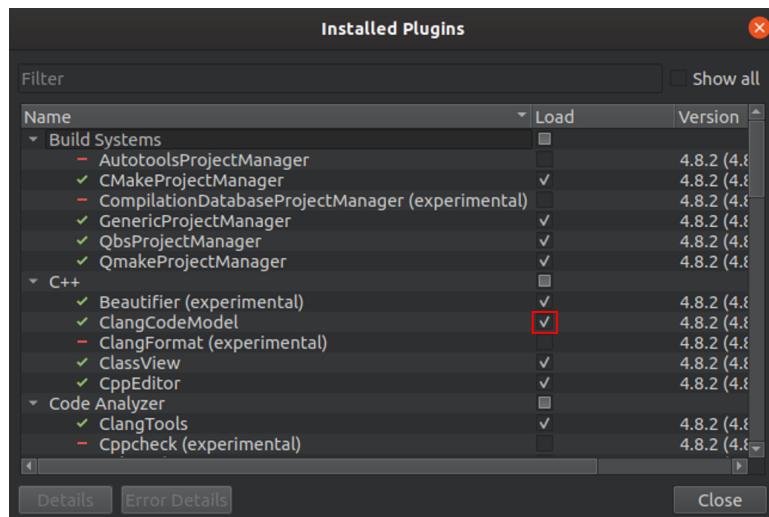
### Implementation for your IDE

#### A) Plugin in Qt Creator

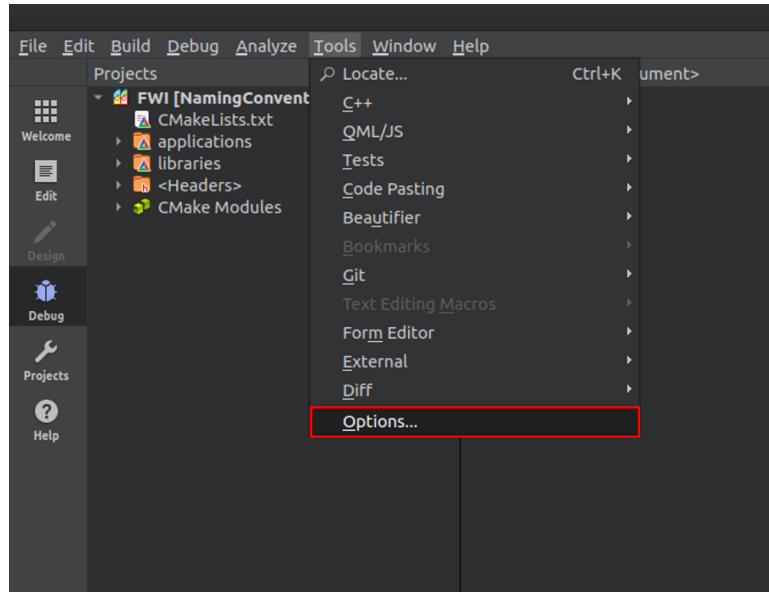
1. To enable the clang-tidy plugin into the Qt Creator IDE, first go to **Help** → **About Plugins...**



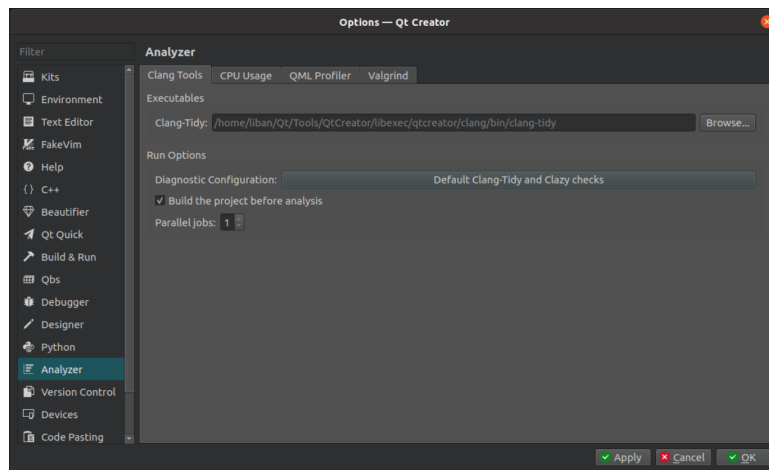
2. Tick the box next to the **ClangCodeModel** if this was not already the case.



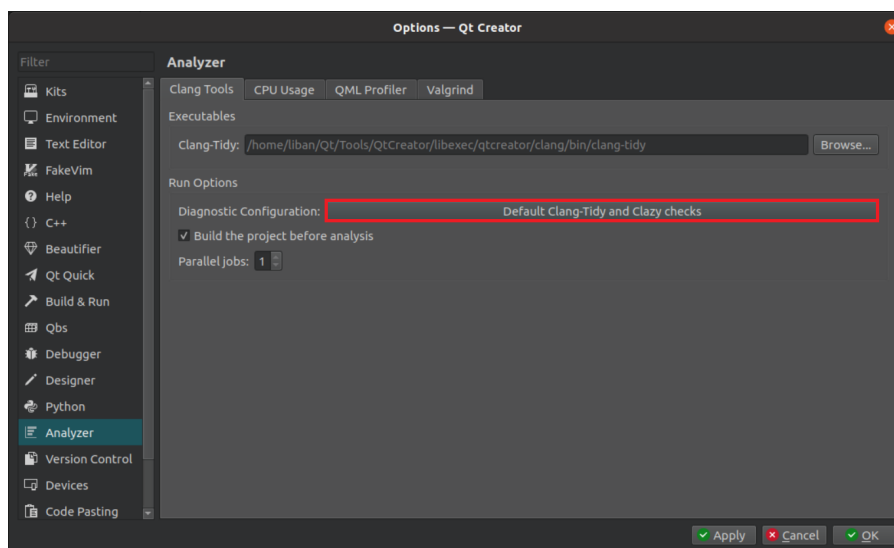
3. Having done this, go to **Tools** → **Options**



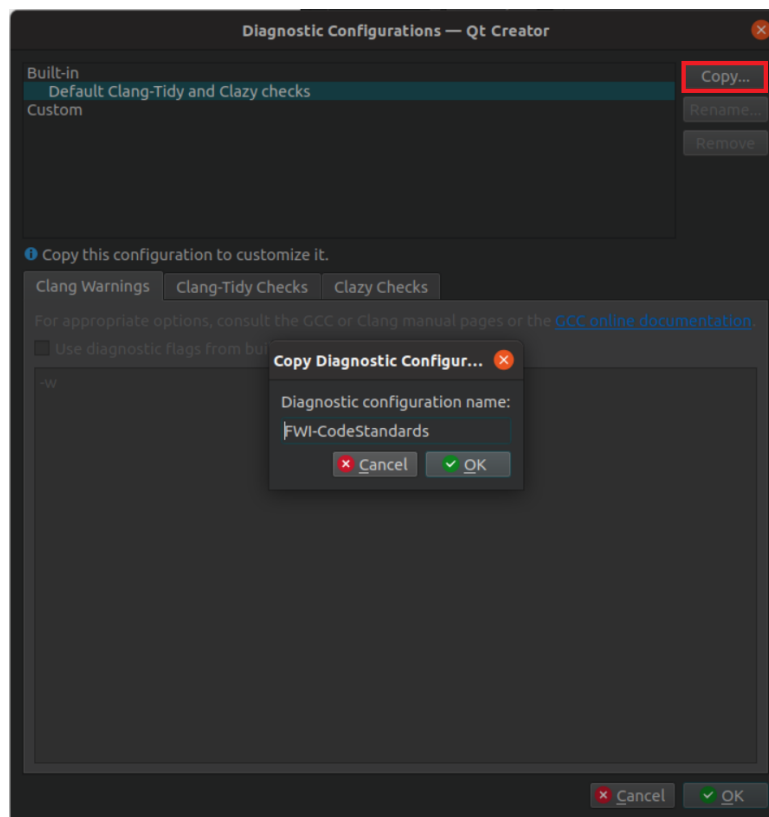
4. In the options, go to **Analyzer** and to the **Clang Tools** tab.



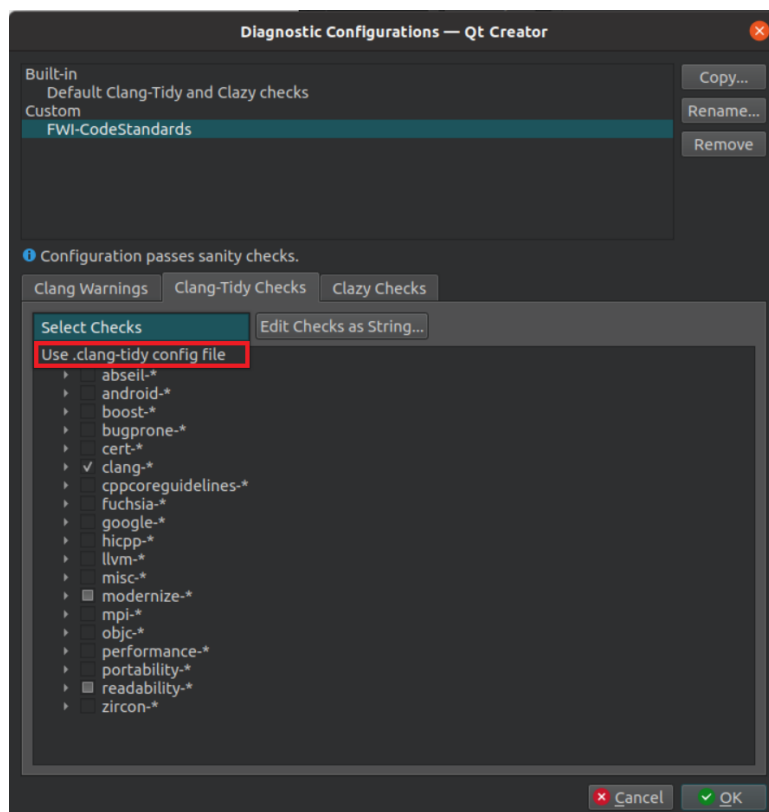
5. Next select Diagnostic Configuration by clicking on **Default Clang-Tidy and Clazy Checks** option.



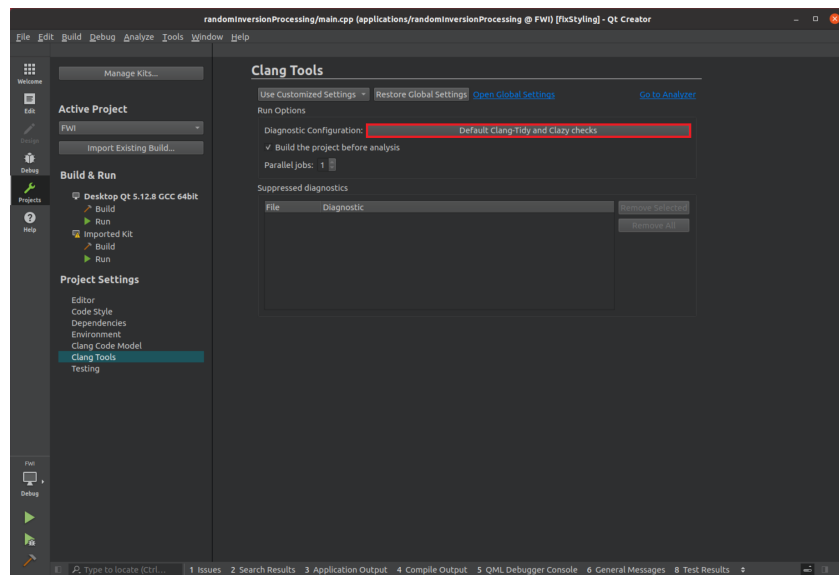
6. Select **Default Clang-Tidy and Clazy checks** and press **Copy** to be able to customize it and give it a suitable name.



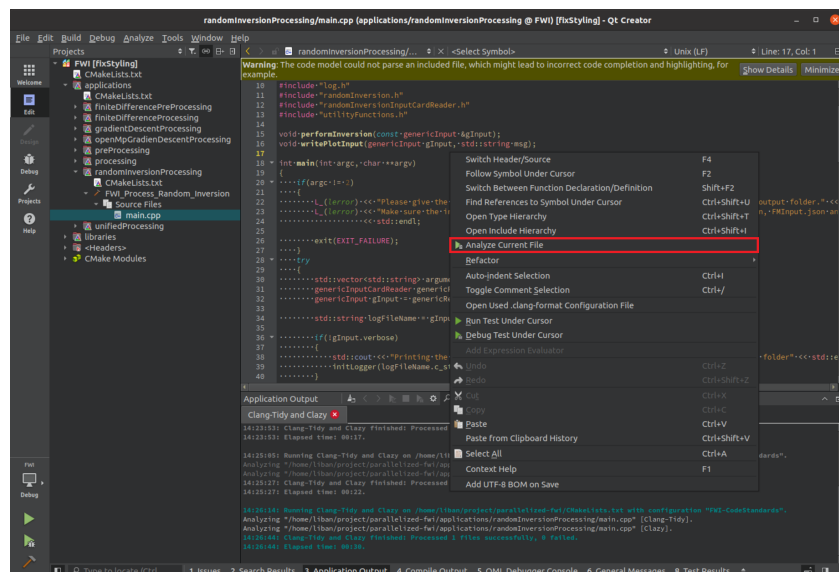
7. Select your own diagnostic configuration, go to the tab **Clang-Tidy Checks**, select **Use .clang-tidy config file** in the drop-down and click **OK**.



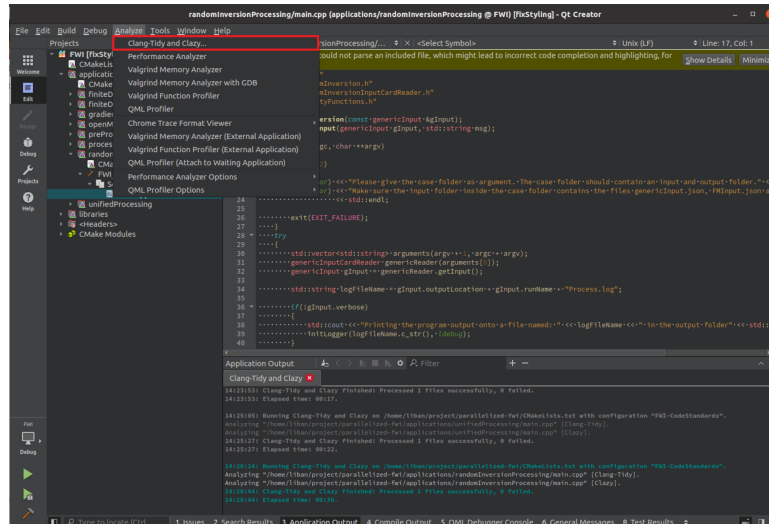
- Lastly, select the newly created diagnostic configuration in **Projects** → **Clang Tools** tab and click on **Default Clang-Tidy and Clazy checks** diagnostic configuration. Since the .clang-tidy file is already set up in the git-folder, the IDE should give warnings according to the style specified in the .clang-tidy file.



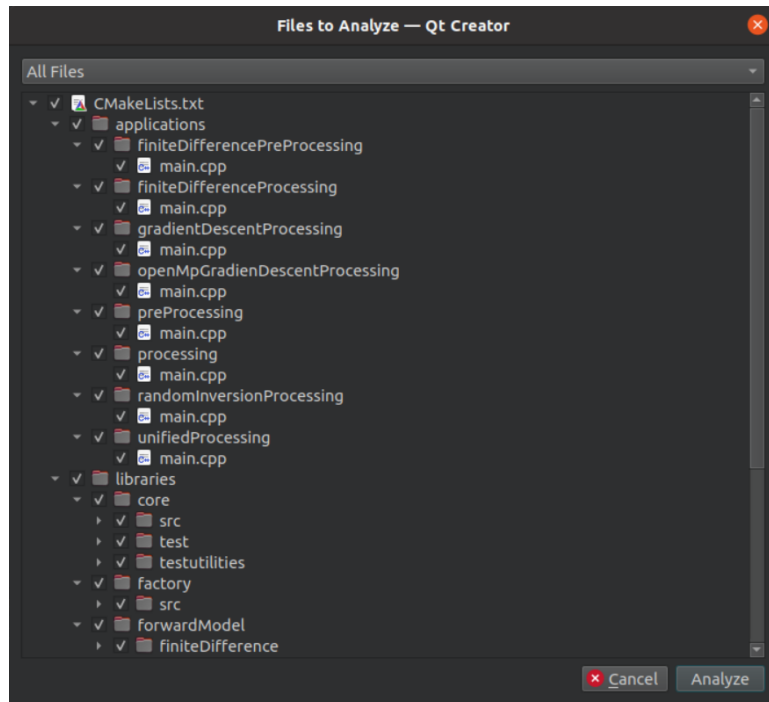
- In order to run the style analysis one should select a project file and use a right mouse button click to activate the context menu. By selecting **Analyze current file** option the style checks can be activated.



10. An alternative way to run the checks on multiple files is to go to **Analyze → Clang-Tidy and Clazy**.



11. And make a final selection of the files which should be checked.



**Note:** It could take a while before the clang-tidy has parsed the project and starts giving warnings.

## B) Clang-tidy in other IDE's

In other IDE's these checks can be implemented in a similar fashion, by using the .clang-tidy configuration file.

## Change the code-standards format

The style used by Clang-Format is implemented in the .clang-tidy file in the parallelized-fwi folder. This file has no name, and is thus simply called .clang-tidy. In Ubuntu it is a hidden file, but it can be shown by clicking **Ctrl + H**.