

IncludeLess

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General Information and Algorithm

IncludeLess is a vscode extension that finds redundant¹ include directives in source and header files.

The idea came from the following [article](#), which describes the disadvantages of useless includes in a project – mainly increased build time.

The algorithm of the extension is as follows:

1. For each source and header file in the folder:
 - 1.1 Find all include directives using regex
 - 1.2 For each include:
 - 1.2.1 Remove include from file
 - 1.2.2 Run 'make'
 - 1.2.3 If success, mark include as useless
 - 1.2.4 Else, restore include
2. Using useless includes ranges, draw a warning squiggle under each one
3. Allow the user to remove useless includes using interactive "Quick Fix"

The extension relies on the fact that a makefile is present in the current folder and that the project compiles before using it.

In case there is no makefile a prompt message will be shown.

¹ Redundant or useless includes are includes that do not alter the logic or behavior of the program.

Code

The code is divided into three parts:

Backend - A C++ executable that gets a folder, finds recursively all the useless includes and writes their ranges to a file.

Frontend (extension.ts) - Written in TypeScript, reads from the ranges file and using vscode extension libraries, marks the useless includes and provides the option to remove them.

Tests - We created 10 scenarios that tests our extension, including simple cases, multiple directories, complex regex cases etc. The run_tests.sh script can be used to compare expected results and actual output.

Development Timeline

- Created extension shell
- Running executable from TypeScript
- Identifying includes using regex
- Using 'make' to identify useless includes
- Ready for demo
- Tests for backend
- Linking backend and frontend using ranges
- Squiggle and 'Quick Fix' for useless includes
- Switching tabs automatically presents correct analysis
- Extension runs on multiple source files and directories