

INTERNSHIP REPORT

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MASTER 1 CSMI

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**Institut de Recherche
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FEEL++

THE FEELPP-DOXYGEN

1 Introduction

Feel++ is a unified C++ implementation of Galerkin methods (finite and spectral element methods) in 1D, 2D And 3D to solve partial differential equations.

For this part of the project, we are interested in generating a Doxygen documentation of the Feelpp project, that is to say, set the mechanisms needed to let the user use *make doxy* in the command line. We create a CMakeLists.txt to enable Doxygen to generate a documentation with the command line *make doxy*.

In the main CMakeLists.txt, we activate the whole process by setting

FEELPP_ENABLE_DOCUMENTATION=ON to enable doxygen to generate the documentation.

2 doxygen/CMakeLists.txt

The main Goal here is to set a mechanism which will allow a user to use *make doxy* in the command line to generate a doc documentation when desired. Below is a proposed CMakeLists.txt to be added in the feelpp/doc/doxygen folder to configure a working environment for doxygen.

```
if(FEELPP_ENABLE_DOXYGEN)
  find_package(Doxygen)
  if(NOT DOXYGEN_FOUND)
    message(FATAL_ERROR
      "Doxygen is needed to build the documentation. Please install it correctly")
  endif()
  configure_file(${CMAKE_CURRENT_SOURCE_DIR}/Doxyfile.in ${PROJECT_BINARY_DIR}/Doxyfile @ONLY)
  configure_file(${CMAKE_CURRENT_SOURCE_DIR}/footer.html ${PROJECT_BINARY_DIR}/footer.html @ONLY)
  configure_file(${CMAKE_CURRENT_SOURCE_DIR}/header.html ${PROJECT_BINARY_DIR}/header.html @ONLY)
  configure_file(${CMAKE_CURRENT_SOURCE_DIR}/layout.xml ${PROJECT_BINARY_DIR}/layout.xml @ONLY)
  configure_file(${CMAKE_CURRENT_SOURCE_DIR}/feel.css ${PROJECT_BINARY_DIR}/feel.css @ONLY)

  add_custom_command(
    OUTPUT ${PROJECT_BINARY_DIR}/html/index.html
           ${PROJECT_BINARY_DIR}/latex/Makefile
           ${PROJECT_BINARY_DIR}/latex/refman.pdf

    COMMAND ${DOXYGEN}
    ARGS     ${PROJECT_BINARY_DIR}/Doxyfile

    DEPENDS  ${PROJECT_BINARY_DIR}/Doxyfile
             ${PROJECT_BINARY_DIR}/html/index.html
             ${PROJECT_BINARY_DIR}/latex/Makefile)

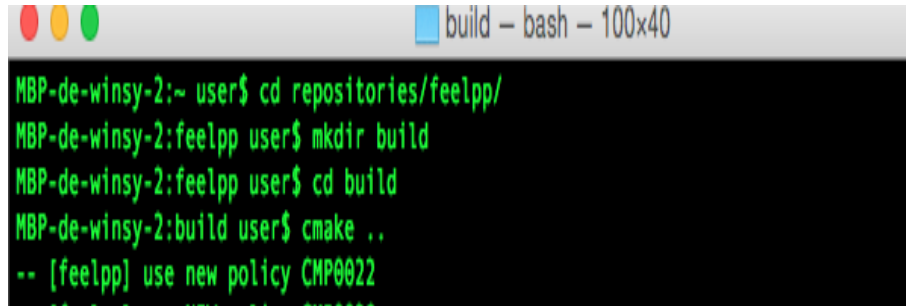
  add_custom_target (doxy ALL
    COMMAND ${DOXYGEN_EXECUTABLE} ${PROJECT_BINARY_DIR}/Doxyfile
    DEPENDS ${PROJECT_BINARY_DIR}/Doxyfile
            # ${CMAKE_CURRENT_DIR}/html/index.html
            # ${CMAKE_CURRENT_BINARY_DIR}/latex/Makefile
    WORKING_DIRECTORY ${PROJECT_BINARY_DIR}
    COMMENT "Generating API documentation with Doxygen" VERBATIM)

endif()
```

To get this CMakeLists.txt linked to our doc/CMakeLists.tx, we add a subdirectory(doxy) in the doc/C-MakeLists.txt. Now our doc/CMakeLists.txt, should look like this :

```
add_custom_target(doc)
if(FEELPP_ENABLE_DOCUMENTATION)
  ADD_SUBDIRECTORY( manual )
  ADD_SUBDIRECTORY( snippets )
endif()
set(FEELPP_INSTALL_APPS ${FEELPP_INSTALL_APPS} PARENT_SCOPE)
if(FEELPP_ENABLE_DOXYGEN)
  ADD_SUBDIRECTORY(doxygen)
endif()
```

To generate the Documentation using Doxygen, in the Feelpp directory, we create a temporary **build** directory where all the generated files will be installed. Then we navigate into the **build** directory and run **cmake ..** in the command line directing to the feelpp source directory.

A terminal window titled "build - bash - 100x40" showing a series of commands and their outputs. The commands are: "cd repositories/feelpp/", "mkdir build", "cd build", and "cmake ..". The outputs are: "MBP-de-winsy-2:~ user\$ cd repositories/feelpp/", "MBP-de-winsy-2:feelpp user\$ mkdir build", "MBP-de-winsy-2:feelpp user\$ cd build", "MBP-de-winsy-2:build user\$ cmake ..", and "-- [feelpp] use new policy CMP0022".

```
MBP-de-winsy-2:~ user$ cd repositories/feelpp/
MBP-de-winsy-2:feelpp user$ mkdir build
MBP-de-winsy-2:feelpp user$ cd build
MBP-de-winsy-2:build user$ cmake ..
-- [feelpp] use new policy CMP0022
```

After all the files have been configured, we run "make doxy". At the end of this, we will have the necessary html and latex files to generate the documentation.

NOTE :

To reset the FEELPP_ENABLE_DOCUMENTATION Option in the command line, use :

```
CMAKE -DFEELPP_ENABLE_DOCUMENTATION = ON
```

3 DIFFICULTIES :

- i. Using the **open html /index.html** command in the command line on ATLAS to launch the html online browser of the documentation generated. That didn't work for me.
- ii. Using the **pdf latex , pdflatex filename** command in the command line on ATLAS to get the pdf format of the documentation generated. That didn't work either.

4 REFERENCES

- 1 [DOXYGEN MANUAL](#)
- 2 [CMAKE COMMANDS](#)
- 3 [MAKEFILE TUTORIAL](#)
- 4 [CMAKE TUTORIAL](#)