Doxygen setup

Necessary tools

Here is a necessary list of tools for generating doxygen documentation:

- Doxygen – download [link](),
- Graphviz (Dot) – download [link](),
- HTMLhelp – download [link]() (not official site),
- PlantUML – download [link]().

Doxywizard

Here are listed minimal settings for Doxygen wizard in order to cover basic documenting points. On top of factory default settings, listed settings should be checked/unchecked and configured.

Specify the working directory… – Enter path where the Doxygen config will be saved

Topics:

- Project:
  - PROJECT_NAME – Enter desired name
  - OUTPUT_DIRECTORY – Enter path where the documentation will be saved
  - FULL_PATH_NAMES – Untick the checkbox
  - ALIASES – Enter aliases listed below
    - globals=@par Globals:^^
    - callsequence=@par Call sequence:^^
  - OPTIMIZE_OUTPUT_FOR_C – Tick the checkbox
- Build:
  - EXTRACT_ALL – Tick the checkbox
  - EXTRACT_STATIC – Tick the checkbox
  - EXTRACT_LOCAL_METHODS – Tick the checkbox
- Input:
  - INPUT – Enter path to root folder of a source code
  - RECURSIVE – Tick the checkbox
  - USE_MDFILE_AS_MAINPAGE – Enter full name of md file
- HTML:
  - GENERATE_HTMLHELP – Tick the checkbox
  - CHM_FILE – Enter name of the CHM file with .chm extension
  - HHC_LOCATION – Enter full path to hhc.exe (including hhc.exe at the end)
- LaTeX:
  - GENERATE_LATEX – Untick the checkbox
- Dot:
  - HAVE_DOT – Tick the checkbox
  - CALL_GRAPH – Tick the checkbox
  - CALLER_GRAPH – Tick the checkbox
  - DOT_PATH – Enter full path to dot.exe (including dot.exe at the end)
  - PLANTUML_JAR_PATH – Enter full path to plantuml.jar (including plantuml.jar at the end)

After completing previous steps, save the configuration by pressing CTRL + S under name "Doxygen.doxy", then open "Run" tab and click on "Run doxygen". This will generate a directory "html" located in OUTPUT_DIRECTORY. This directory contains everything that the Doxygen has processed. Documents which contain full documentation are named "index.html" and CHM_FILE.

Script for generating Doxygen documentation

Previous approach introduces few problems:

1. Paths to input, output and tool directories may have been set as relative paths to current directory, for example:
   PLANTUML_JAR_PATH = ../../../../../../Tools/plantuml/plantuml-1.2022.13.jar
   This in turn makes it impossible to move our files without changing current settings since they depend on current directory.
2. Paths to input, output and tool directories may have been set as hard-coded, for example:
   HHC_LOCATION = "C:/Program Files (x86)/HTML Help Workshop/hhc.exe"
   This problem is less severe than the last, but still poses an issue when more than one person is working on a project. This forces all who work on same project to have the same installation paths for tools.
3. In order to generate documentation, Doxywizard tool is used.

First improvement would be to be able to generate documentation without Doxywizard. This can easily be achieved by creating batch file which would call "doxygen.exe" with "Doxyfile.doxy" as a parameter:
C:\Tools\doxygen\bin\doxygen.exe Doxyfile.doxy

Second improvement would be to make Doxygen configuration independent from the project. This can be achieved by updating previously mentioned batch file with a set of variables which will hold information about input, output and tool directories as well as specific names used as project names or output file names. Example of how this can be done:

- Directory:
  1. Create variable in batch file which holds a location to tool exe file:
     SET HHC_EXE="C:/Program Files (x86)/HTML Help Workshop/hhc.exe"
  2. In Doxyfile.doxy file set HHC_LOCATION as follows:
     HHC_LOCATION = $(HHC_EXE)
- Project name:
  1. Create variable in batch file which holds a name of a project:
     SET PRJ_NAME=WatchDog Module
  2. In Doxyfile.doxy file set PROJECT_NAME as follows:
     PROJECT_NAME = $(PRJ_NAME)

Third improvement would be to make batch script independent from system setting. This can be achieved first by creating Environment variables for each tool which is used in batch script. This can be done by opening System Environment setting by pressing (⊞ + R) and then typing "sysdm.cpl", open "Advanced" tab and select "Environment variables…". Pressing "New…" under "User variables for ***" section will prompt new window. Here new variable can be created by entering its name and path to the exe file, here is an example:
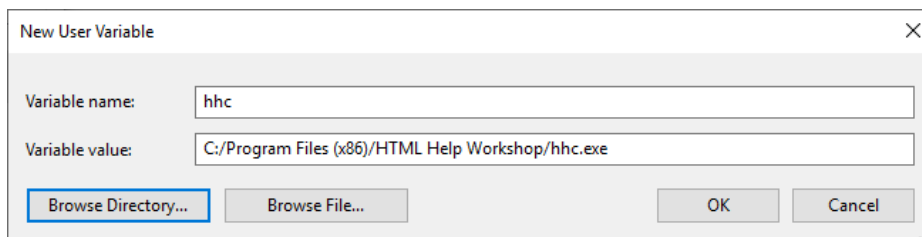
Now in the batch script variable HHC_EXE can be mapped to previously created environment variable, like this:
SET HHC_EXE=%hhc%

This should be done for each tool used in a batch script.

After implementing these three improvements, entire generation process is made to be independent from users' own configuration, except for the first time when the user needs to set environment variables, in case that tool installation didn't already do so.