1주차 과제 산출물

작성자	최부근

분석 대상

chromium-review.googlesource.com

Gerrit Code Review

https://chromium-review.googlesource.com/c/v8/v8/+/6298237

V8 빌드

1. **V8 다운로드**

```
git clone https://chromium.googlesource.com/v8/v8
git fetch origin
```

2. **취약점 발생 커밋 체크아웃**

```
git checkout e9c28abfe4d8f4c86c15d0280645bc95cbae9779^
git log --grep="Cr-Commit-Position: refs/heads/main@{#98911}" -n 1

cd v8
gclient sync
```

3. **depot 설치**

```
git clone https://chromium.googlesource.com/chromium/tools/depot_tools.git
export PATH="$PWD/depot_tools:$PATH"
```

4. **SourceCode database(JSON) 익스포트용 gn 빌드**

```
gn gen out.gn/x64.release --export-compile-commands --args='is_debug=fal
```

옵션 설명:

export-compile-commands	**컴파일 데이터베이스 익스포트** (컴파일시 사용되는 옵션 기록)
is_debug	**디버그 심볼 포함 여부** (true면 심볼 포함, false면 심볼 미포함)
v8_monolithic	**라이브러리 패키징 여부 (true면 하나의 라이브러리, false면 여러 라이브러리)**
v8_use_external_startup_data	
is_component_build	
is_clang	**Clang 컴파일러를 사용할지 여부**
clang_use_chrome_plugins	**크롬에서 제공되는 Clang 플러그인 사용 여부**

5. **익스포트된 db 간소화**

```
[
{
"file": "../../src/compiler/turbofan-typer.cc",
"directory": "/home/bugeun/v8/v8/out.gn/x64.release",
"command": " ../../third_party/llvm-build/Release+Asserts/bin/clang++ -
MMD -MF  obj/v8_compiler/turbofan-typer.o.d  -DUSE_UDEV -
DUSE_AURA=1 -DUSE_GLIB=1 -DUSE_OZONE=1 -
D__STDC_CONSTANT_MACROS -D__STDC_FORMAT_MACROS -
D_FORTIFY_SOURCE=2 -D_FILE_OFFSET_BITS=64 -
D_LARGEFILE_SOURCE -D_LARGEFILE64_SOURCE -D_GNU_SOURCE \"-
DCR_CLANG_REVISION=\\\"llvmorg-21-init-1655-g7b473dfe-1\\\"\" -
D_LIBCPP_HARDENING_MODE=
LIBCPP_HARDENING_MODE_EXTENSIVE -
D_LIBCPP_DISABLE_VISIBILITY_ANNOTATIONS -
D_LIBCXXABI_DISABLE_VISIBILITY_ANNOTATIONS -
D_LIBCPP_INSTRUMENTED_WITH_ASAN=0 -
DCR_LIBCXX_REVISION=cdc82e180c610aaa7153301fea4d6b4005da9f22
-DTMP_REBUILD_HACK -DCR_SYSROOT_KEY=20250129T203412Z-1 -
DNDEBUG -DNVALGRIND -DDYNAMIC_ANNOTATIONS_ENABLED=0 -
DV8_TYPED_ARRAY_MAX_SIZE_IN_HEAP=64 -
DENABLE_GDB_JIT_INTERFACE -DV8_INTL_SUPPORT -
DV8_ATOMIC_OBJECT_FIELD_WRITES -
DV8_ENABLE_LAZY_SOURCE_POSITIONS -DV8_WIN64_UNWINDING_INFO
-DV8_ENABLE_REGEXP_INTERPRETER_THREADED_DISPATCH -
DV8_ENABLE_FUZZTEST -DV8_SHORT_BUILTIN_CALLS -
DV8_EXTERNAL_CODE_SPACE -DV8_ENABLE_SPARKPLUG -
DV8_ENABLE_MAGLEV -DV8_ENABLE_TURBOFAN -
DV8_ENABLE_WEBASSEMBLY -
DV8_ENABLE_CONTINUATION_PRESERVED_EMBEDDER_DATA -
DV8_ALLOCATION_FOLDING -DV8_ALLOCATION_SITE_TRACKING -
DV8_ADVANCED_BIGINT_ALGORITHMS -DV8_STATIC_ROOTS -
DV8_USE_ZLIB -DV8_USE_LIBM_TRIG_FUNCTIONS -
DV8_ENABLE_WASM_SIMD256_REVEC -
DV8_ENABLE_MAGLEV_GRAPH_PRINTER -
DV8_ENABLE_BUILTIN_JUMP_TABLE_SWITCH -
DV8_ENABLE_EXTENSIBLE_RO_SNAPSHOT -
DV8_ENABLE_BLACK_ALLOCATED_PAGES -DV8_ENABLE_LEAPTIERING -
```

```
DV8_WASM_RANDOM_FUZZERS -
DV8_ARRAY_BUFFER_INTERNAL_FIELD_COUNT=0 -
DV8_ARRAY_BUFFER_VIEW_INTERNAL_FIELD_COUNT=0 -
DV8_PROMISE_INTERNAL_FIELD_COUNT=0 -DV8_COMPRESS_POINTERS
-DV8_COMPRESS_POINTERS_IN_SHARED_CAGE -
DV8_31BIT_SMIS_ON_64BIT_ARCH -DV8_ENABLE_SANDBOX -
DV8_DEPRECATION_WARNINGS -
DV8_IMMINENT_DEPRECATION_WARNINGS -DV8_HAVE_TARGET_OS -
DV8_TARGET_OS_LINUX -DCPPGC_CAGED_HEAP -
DCPPGC_YOUNG_GENERATION -DCPPGC_POINTER_COMPRESSION -
DCPPGC_ENABLE_LARGER_CAGE -DCPPGC_SLIM_WRITE_BARRIER -
DV8_TARGET_ARCH_X64 -DV8_RUNTIME_CALL_STATS -
DABSL_ALLOCATOR_NOTHROW=1 -DU_USING_ICU_NAMESPACE=0 -
DU_ENABLE_DYLOAD=0 -DUSE_CHROMIUM_ICU=1 -
DU_ENABLE_TRACING=1 -DU_ENABLE_RESOURCE_TRACING=0 -
DU_STATIC_IMPLEMENTATION -
DICU_UTIL_DATA_IMPL=ICU_UTIL_DATA_FILE  -I../.. -Igen -
I../../buildtools/third_party/libc++ -I../../include -I../../third_party/abseil-cpp
-Igen/include -I../../third_party/icu/source/common -
I../../third_party/icu/source/i18n -I../../third_party/fp16/src/include  -Wall -
Wextra -Wimplicit-fallthrough -Wextra-semi -Wunreachable-code-
aggressive -Wthread-safety -Wgnu -Wno-gnu-anonymous-struct -Wno-
gnu-conditional-omitted-operand -Wno-gnu-include-next -Wno-gnu-label-
as-value -Wno-gnu-redeclared-enum -Wno-gnu-statement-expression -
Wno-gnu-zero-variadic-macro-arguments -Wno-zero-length-array -Wno-
missing-field-initializers -Wno-unused-parameter -Wno-psabi -Wloop-
analysis -Wno-unneeded-internal-declaration -Wno-cast-function-type -
Wno-thread-safety-reference-return -Wno-nontrivial-memcall -Wshadow -
Werror -fno-delete-null-pointer-checks -fno-strict-overflow -fno-ident -
fno-strict-aliasing -fstack-protector -funwind-tables -fPIC -pthread -
fcolor-diagnostics -fmerge-all-constants -fno-sized-deallocation -fcrash-
diagnostics-dir=../../tools/clang/crashreports -mllvm -instcombine-lower-
dbg-declare=0 -mllvm -split-threshold-for-reg-with-hint=0 -ffp-
contract=off -Wa,--crel,--allow-experimental-crel -fcomplete-member-
pointers -m64 -msse3 -Wno-builtin-macro-redefined -D__DATE_= -
D__TIME__= -D__TIMESTAMP__= -ffile-compilation-dir=. -no-canonical-
prefixes -fno-omit-frame-pointer -g0 -Wheader-hygiene -Wstring-
conversion -Wtautological-overlap-compare -Wunreachable-code -Wctad-
```

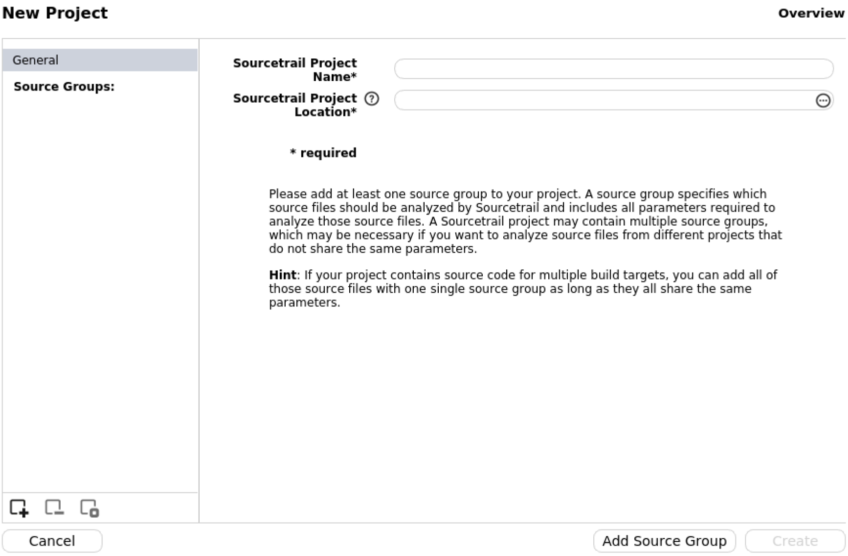
```
maybe-unsupported -Wno-invalid-offsetof -Wshorten-64-to-32 -
Wmissing-field-initializers -O3 -fdata-sections -ffunction-sections -fno-
unique-section-names -fno-math-errno -fvisibility=default -Wexit-time-
destructors  -Wno-invalid-offsetof -Wenum-compare-conditional -Wno-
c++11-narrowing-const-reference -Wno-missing-template-arg-list-after-
template-kw -std=c++20 -Wno-trigraphs -gsimple-template-names -fno-
exceptions -fno-rtti -nostdinc++ -isystem../../third_party/libc++/src/include
-isystem../../third_party/libc++abi/src/include --
sysroot=../../build/linux/debian_bullseye_amd64-sysroot  -c
../../src/compiler/turbofan-typer.cc -o  obj/v8_compiler/turbofan-typer.o"
}
]
```

Sourcetrail 사용법

1. **Sourcetrail 설치 및 실행**

```
wget https://github.com/CoatiSoftware/Sourcetrail/releases/download/2021.4
./Sourcetrail_2021_4_19_Linux_64bit.AppImage
```

2. **프로젝트 이름과 V8 소스코드 경로 추가**



New Project

Overview

General

Source Groups:

Sourcetrail Project Name*

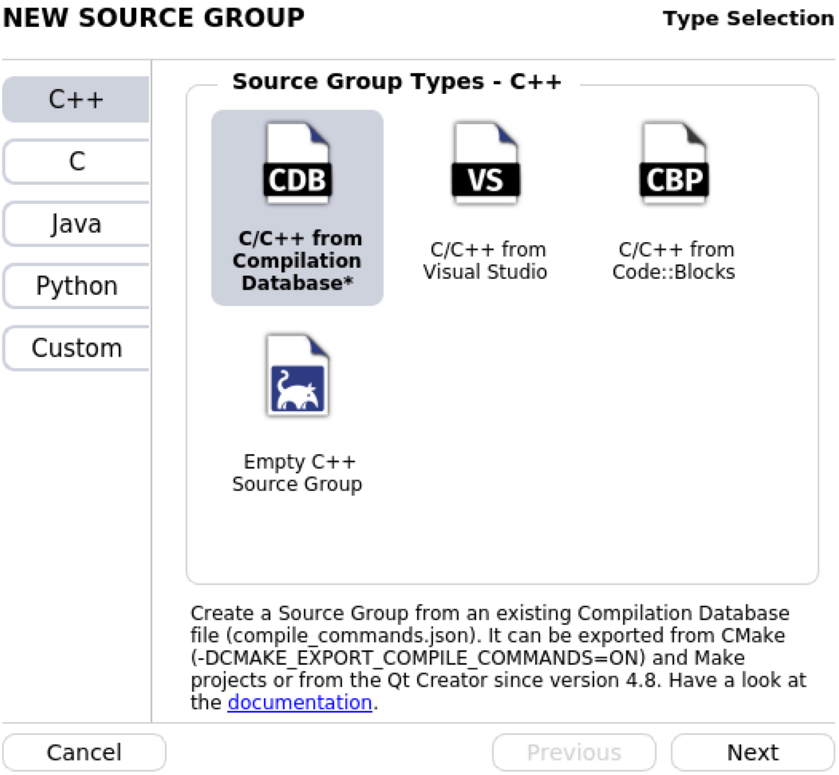
Sourcetrail Project Location*

* required

Please add at least one source group to your project. A source group specifies which source files should be analyzed by Sourcetrail and includes all parameters required to analyze those source files. A Sourcetrail project may contain multiple source groups, which may be necessary if you want to analyze source files from different projects that do not share the same parameters.

Hint: If your project contains source code for multiple build targets, you can add all of those source files with one single source group as long as they all share the same parameters.

3. **C/C++ 소스코드 데이터베이스 선택**



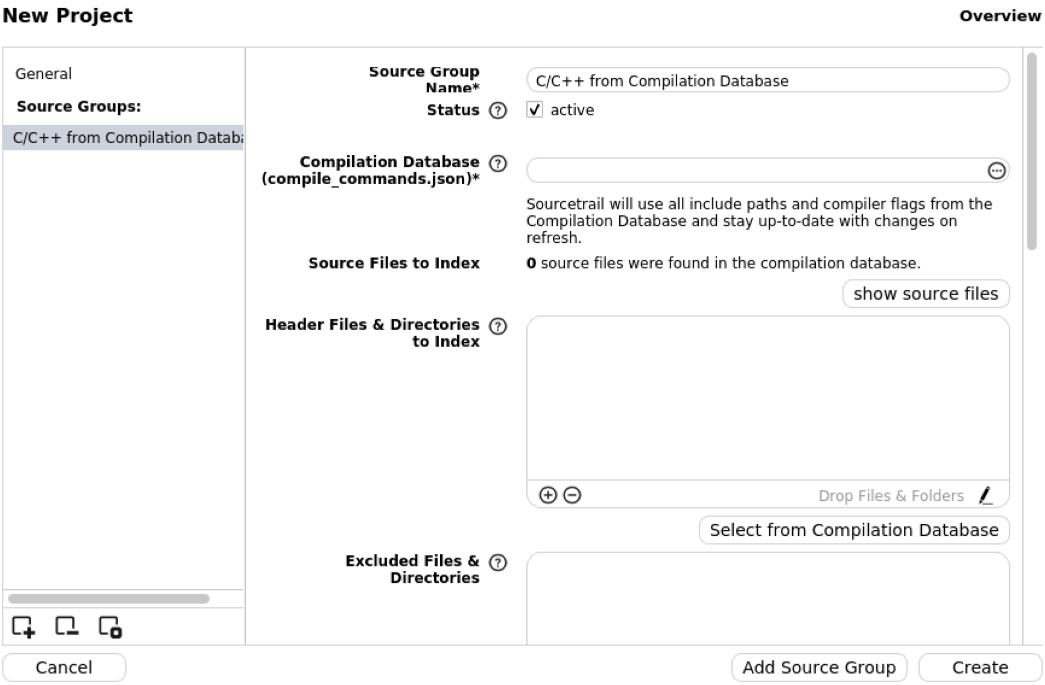
NEW SOURCE GROUP

Type Selection

Create a Source Group from an existing Compilation Database file (compile_commands.json). It can be exported from CMake (-DCMAKE_EXPORT_COMPILE_COMMANDS=ON) and Make projects or from the Qt Creator since version 4.8. Have a look at the documentation.

4. **Compilation Database에 익스포트한 소스코드 데이터베이스를 입력하고 Excluded Files에는 아래 폴더를 추가**

```
third-party
test
testing
```



New Project

Overview

General

Source Groups:

C/C++ from Compilation Databa

Source Group Name*: C/C++ from Compilation Database

Status ?: ☑ active

Compilation Database (compile_commands.json)* ?:

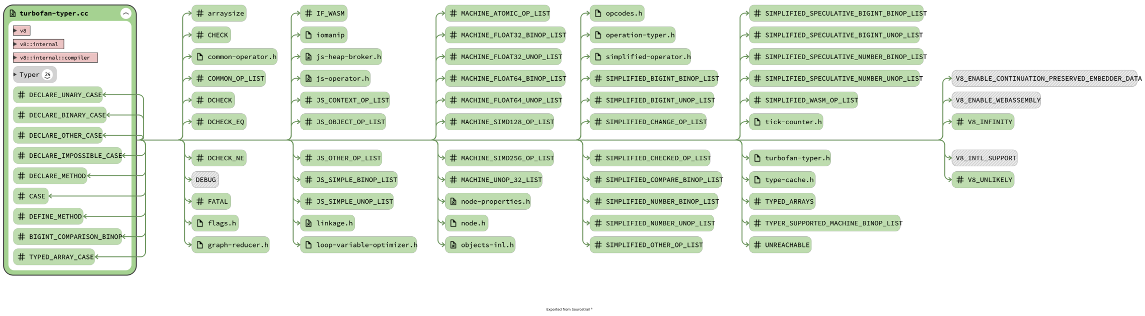
Sourcetrail will use all include paths and compiler flags from the Compilation Database and stay up-to-date with changes on refresh.

Source Files to Index: **0** source files were found in the compilation database.

Header Files & Directories to Index ?:

Excluded Files & Directories ?:

5. **Create 선택 후 Indexing 했을 때 보이는 최종 결과**

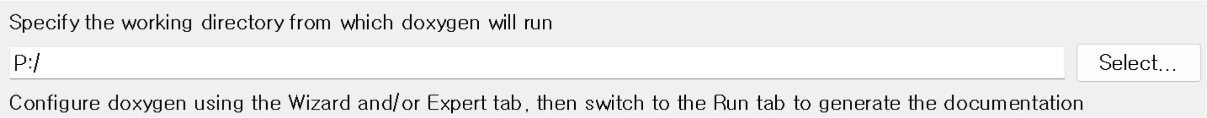


Doxygen 사용법

1. **Doxygen 설치**

```
https://www.doxygen.nl/download.html
```

2. **Doxywizard 실행 후 실행 경로 지정**

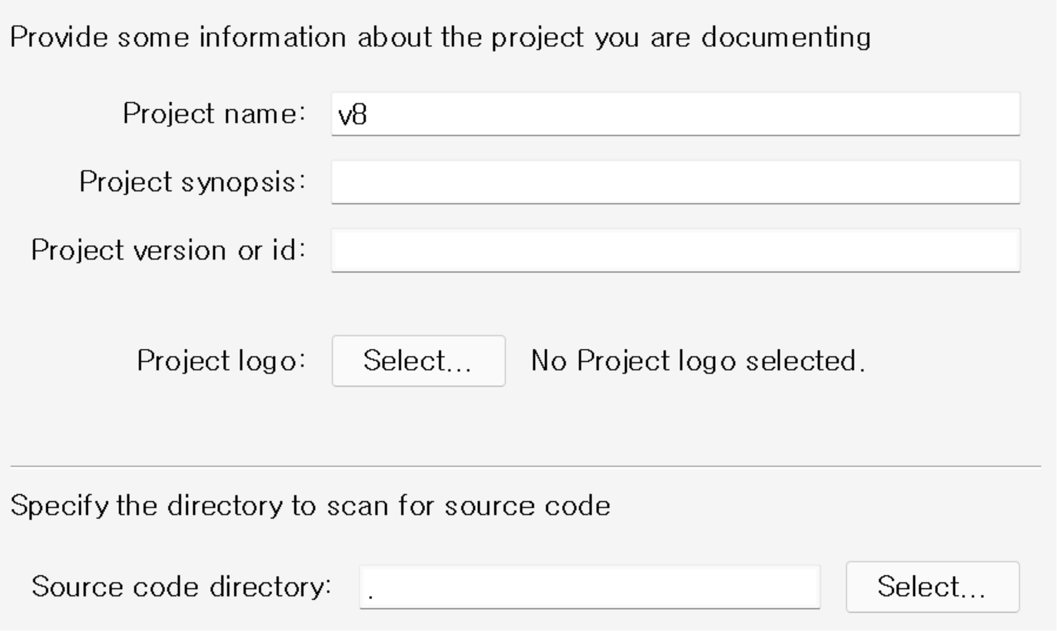


Specify the working directory from which doxygen will run

P:/

Configure doxygen using the Wizard and/or Expert tab, then switch to the Run tab to generate the documentation

3. **프로젝트 정보와 소스 코드 경로 설정**



Provide some information about the project you are documenting

Project name: v8

Project synopsis:

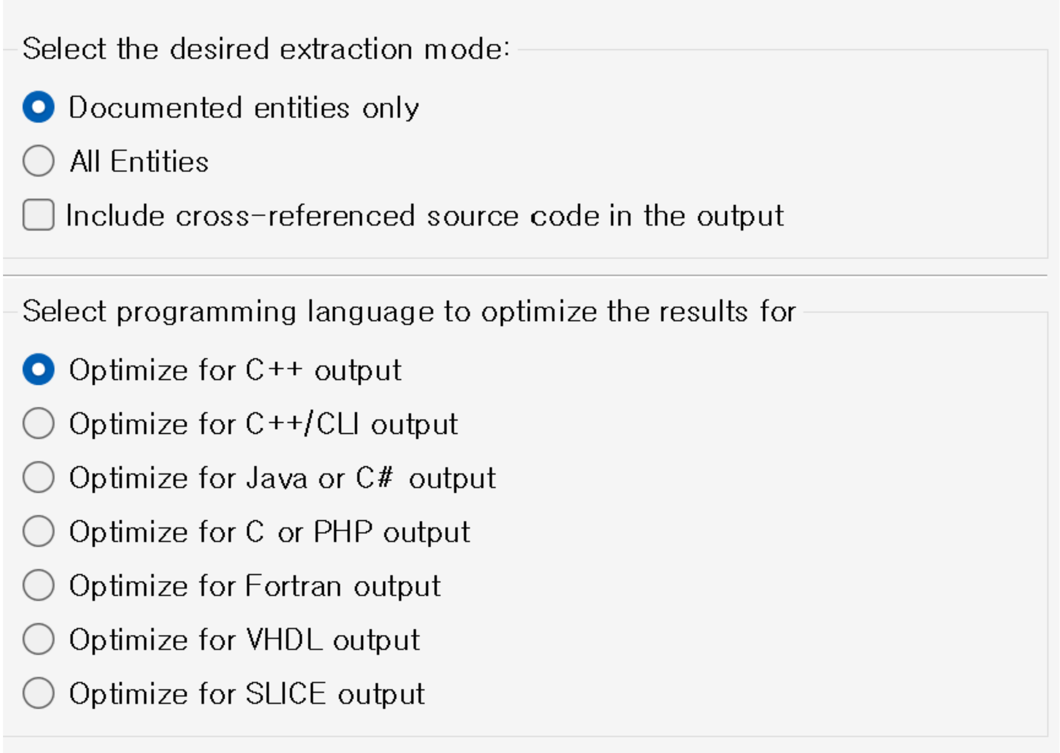
Project version or id:

Project logo: No Project logo selected.

Specify the directory to scan for source code

Source code directory: .

4. **소스코드 언어 설정**



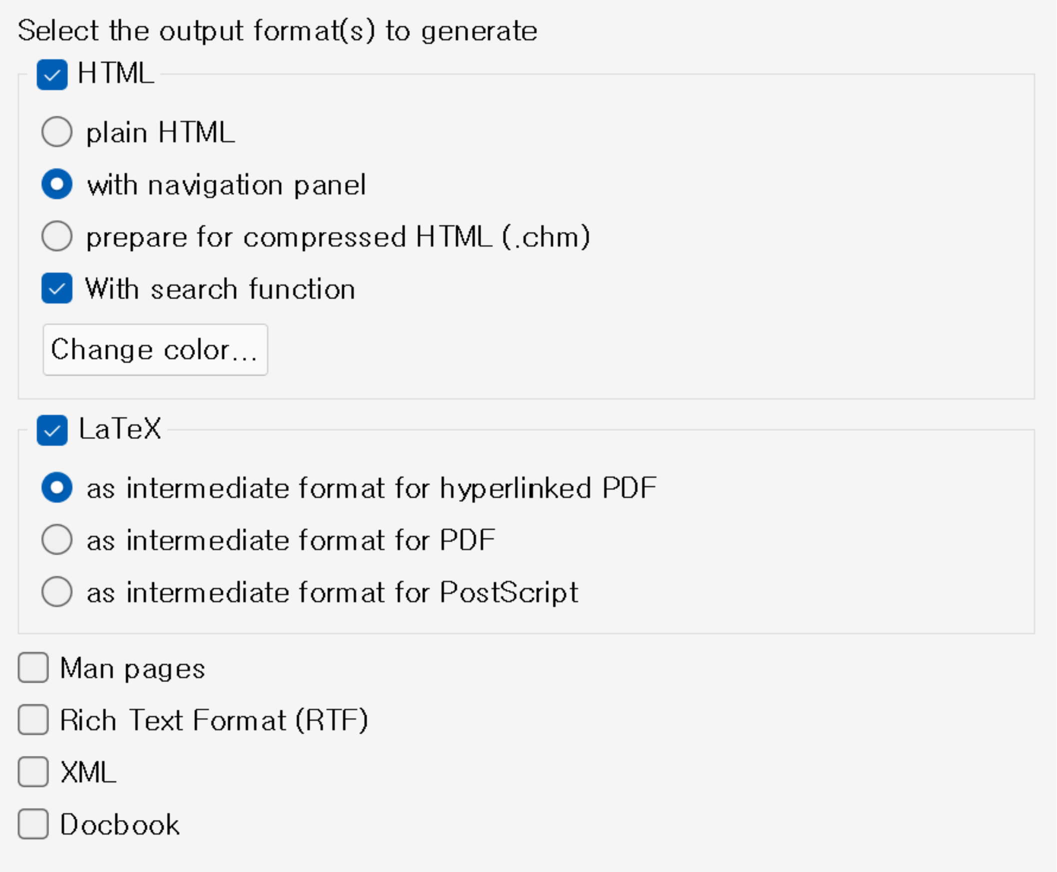
Select the desired extraction mode:

● Documented entities only
○ All Entities
□ Include cross-referenced source code in the output

Select programming language to optimize the results for

● Optimize for C++ output
○ Optimize for C++/CLI output
○ Optimize for Java or C# output
○ Optimize for C or PHP output
○ Optimize for Fortran output
○ Optimize for VHDL output
○ Optimize for SLICE output

5. 출력 결과(포맷, 확장자 등) 설정



Select the output format(s) to generate

☑ HTML

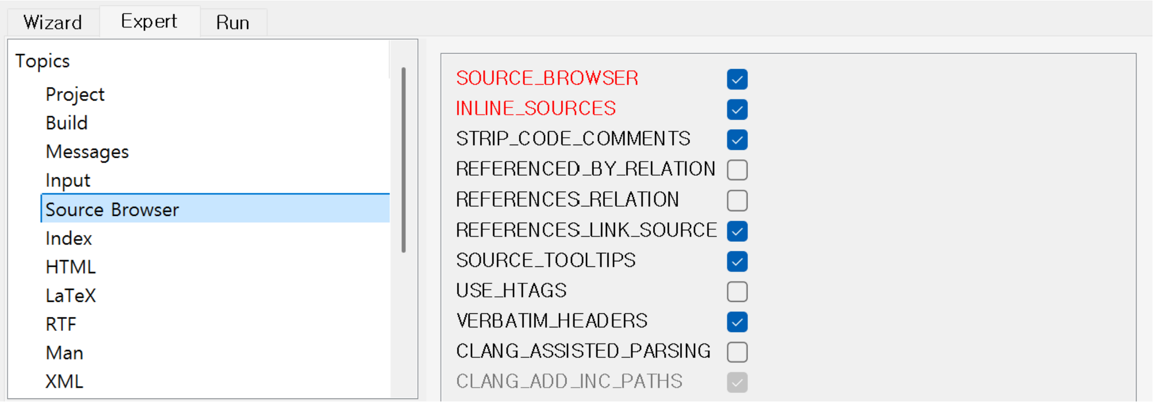
○ plain HTML
● with navigation panel
○ prepare for compressed HTML (.chm)
☑ With search function

☑ LaTeX

● as intermediate format for hyperlinked PDF
○ as intermediate format for PDF
○ as intermediate format for PostScript

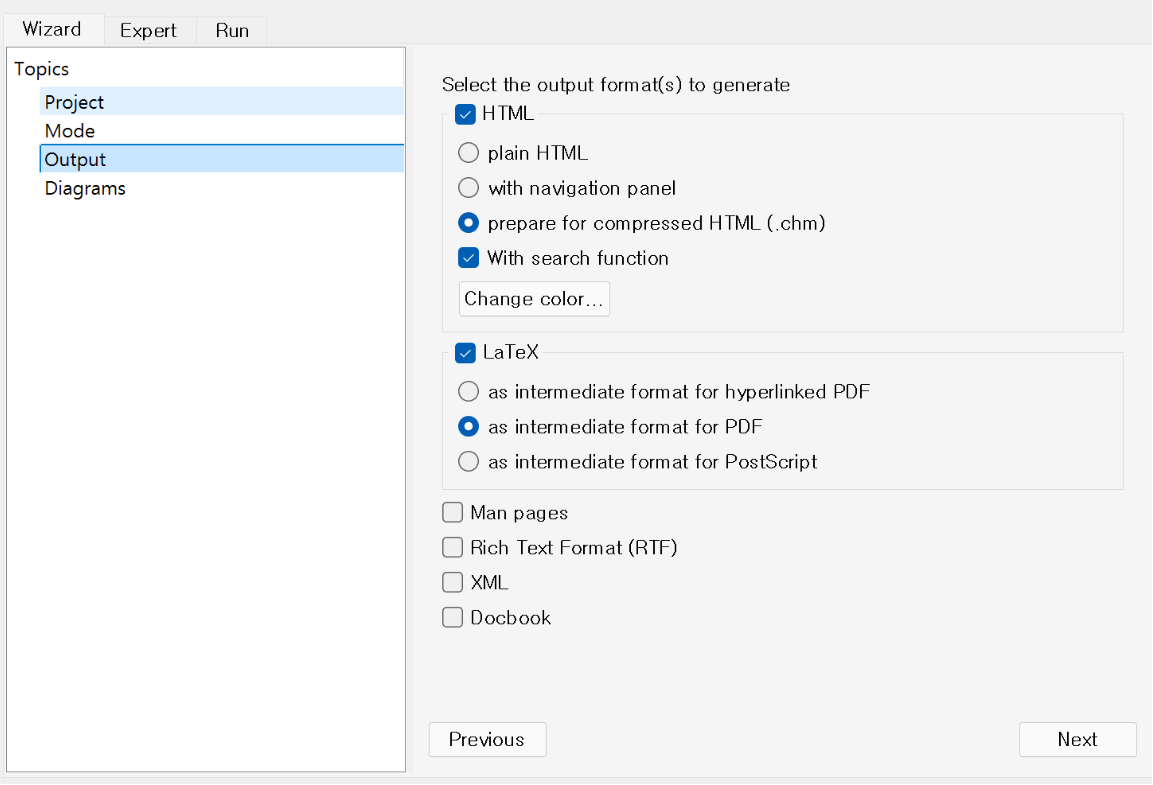
□ Man pages
□ Rich Text Format (RTF)
□ XML
□ Docbook

7. **소스 브라우저 설정 (INLINE_SOURCES 설정 시 각 멤버 함수마다 소스를 보여준다.)**



SOURCE_BROWSER ☑
INLINE_SOURCES ☑
STRIP_CODE_COMMENTS ☑
REFERENCED_BY_RELATION □
REFERENCES_RELATION □
REFERENCES_LINK_SOURCE ☑
SOURCE_TOOLTIPS ☑
USE_HTAGS □
VERBATIM_HEADERS ☑
CLANG_ASSISTED_PARSING □
CLANG_ADD_INC_PATHS ☑

8. **CHM 설정 (CHM은 마이크로 소프트의 도움말 포맷으로 개인적으로 보기 더 편리하였음)**



Select the output format(s) to generate

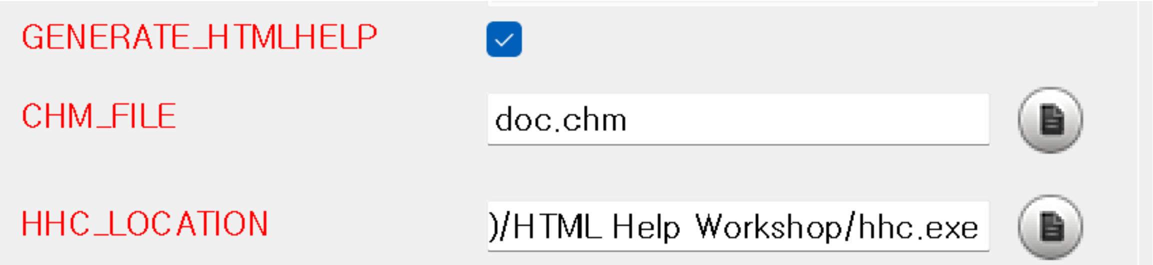
☑ HTML

○ plain HTML
○ with navigation panel
● prepare for compressed HTML (.chm)
☑ With search function

☑ LaTeX

○ as intermediate format for hyperlinked PDF
● as intermediate format for PDF
○ as intermediate format for PostScript

□ Man pages
□ Rich Text Format (RTF)
□ XML
□ Docbook



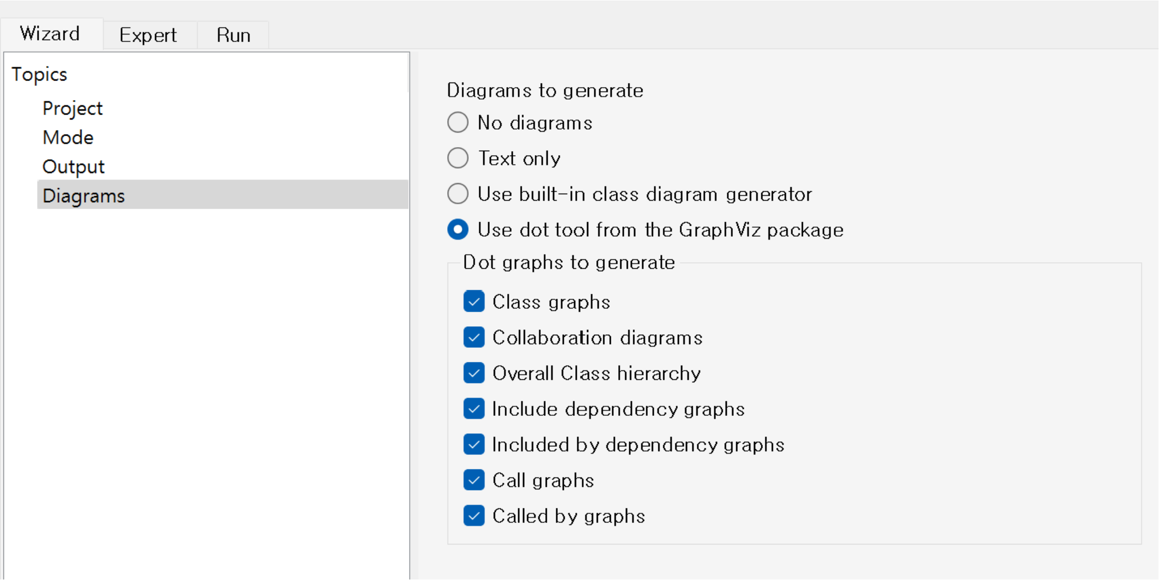
GENERATE_HTMLHELP ☑

CHM_FILE doc.chm

HHC_LOCATION)/HTML Help Workshop/hhc.exe

HHC_LOCATION 기본 경로는 (C:\Program Files (x86)\HTML Help Workshop)

9. **GraphViz 설정 (GraphViz 설치 방법은 생략)**



Diagrams to generate

○ No diagrams

○ Text only

○ Use built-in class diagram generator

● Use dot tool from the GraphViz package

Dot graphs to generate

☑ Class graphs

☑ Collaboration diagrams

☑ Overall Class hierarchy

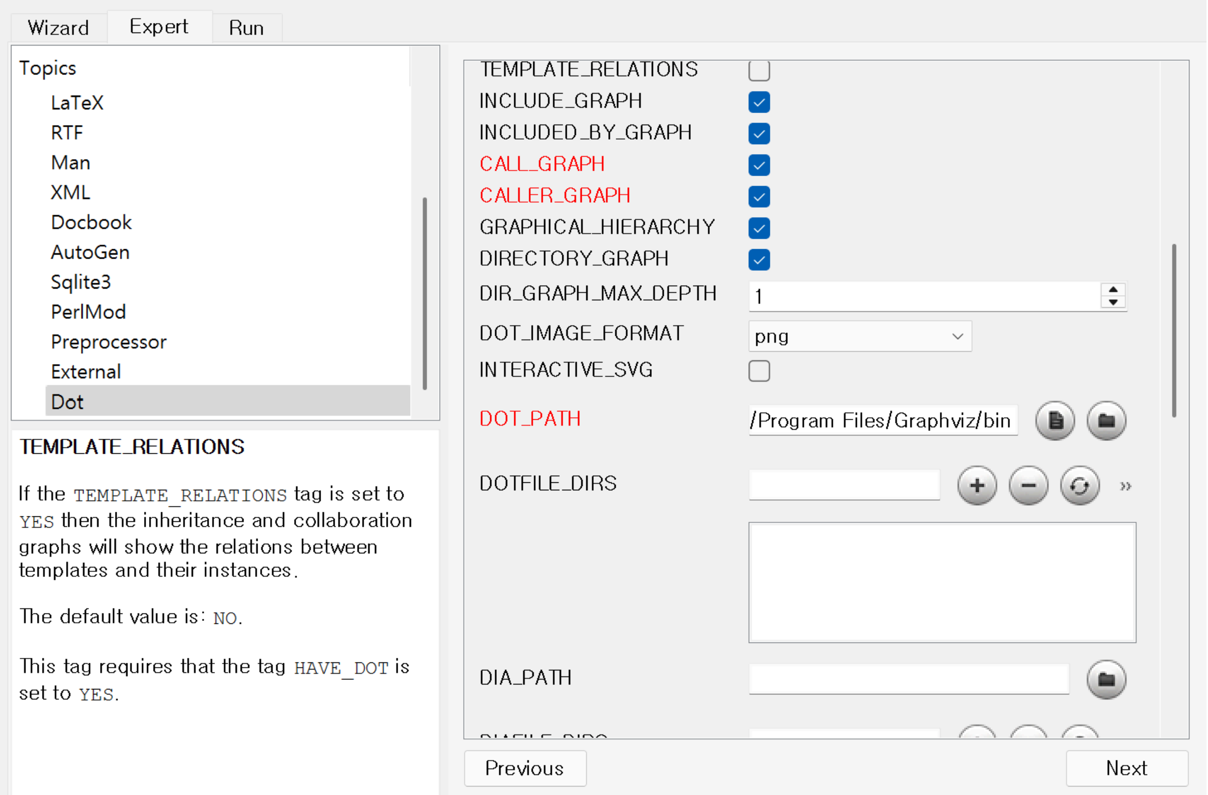
☑ Include dependency graphs

☑ Included by dependency graphs

☑ Call graphs

☑ Called by graphs

Use dot toll from the GraphViz package 선택



TEMPLATE_RELATIONS

If the TEMPLATE_RELATIONS tag is set to YES then the inheritance and collaboration graphs will show the relations between templates and their instances.

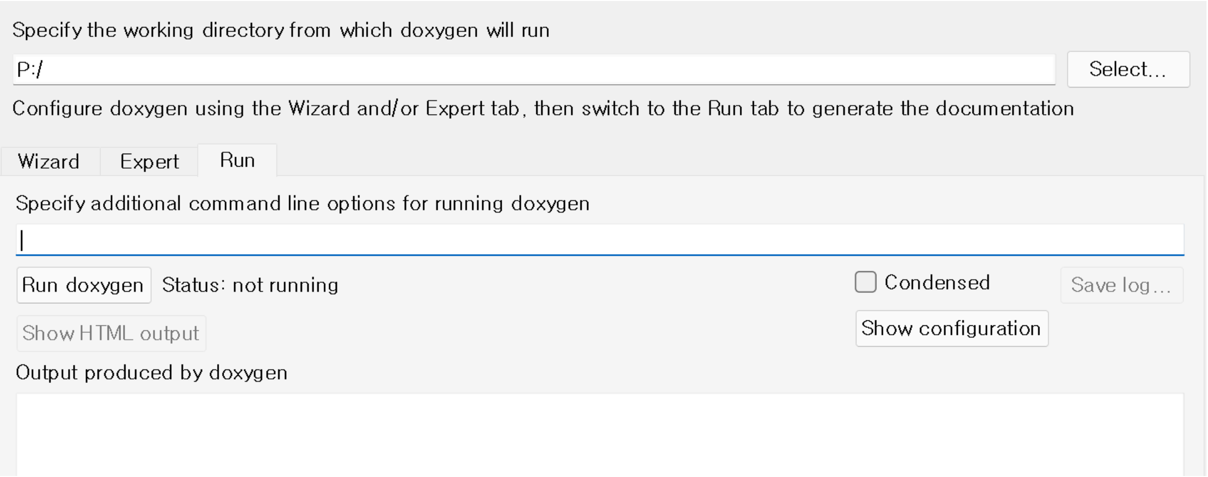
The default value is: NO.

This tag requires that the tag HAVE_DOT is set to YES.

TEMPLATE_RELATIONS □
INCLUDE_GRAPH ☑
INCLUDED_BY_GRAPH ☑
CALL_GRAPH ☑
CALLER_GRAPH ☑
GRAPHICAL_HIERARCHY ☑
DIRECTORY_GRAPH ☑
DIR_GRAPH_MAX_DEPTH 1
DOT_IMAGE_FORMAT png
INTERACTIVE_SVG □
DOT_PATH /Program Files/Graphviz/bin
DOTFILE_DIRS
DIA_PATH

DOT_PATH에 GraphViz 바이너리 경로 설정

10. 문서화 실행 (Expert → Project → Language 설정에서 한국어 설정 가능)



Specify the working directory from which doxygen will run

P:/

Configure doxygen using the Wizard and/or Expert tab, then switch to the Run tab to generate the documentation

Specify additional command line options for running doxygen

Status: not running

□ Condensed

Output produced by doxygen

11. 최종 결과 파일(HTML.zip 참조)