Documentation Tool: Doxygen

1. Introduction:

Doxygen is a documentation generating tool which is used to create a reference manual from the source code. It is useful for languages like C, C++, Java, Python etc. This tool extracts comments from the source code and produces documentation in various formats, like, HTML or LaTeX.

2. Documentation:

To view the overview of Doxygen, click here.

3. Installation and Usage:

3.1. Installation:

- Download and install Doxygen from its official website by clicking on this link.

3.2. Usage:

- Create a Doxyfile (where the documentation file will be saved) by executing these commands in the command prompt or terminal.

```
C:\Users\User\Desktop\Demo>doxygen -g
```

- Configure the Doxyfile by opening the Doxyfile in a text-editor and set these values accordingly:

  # OPTIMIZE_OUTPUT_JAVA to YES, and,

```
OPTIMIZE_OUTPUT_JAVA   = YES

# Set the OPTIMIZE_FOR_FORTRAN tag to YES if your project consists of Fortran
# sources. Doxygen will then generate output that is tailored for Fortran.
# The default value is: NO.
```

INPUT field to the directory to the file containing Java source files.

```
INPUT                  = C:/Users/User/Desktop/Demo

# This tag can be used to specify the character encoding of the source files
# that Doxygen parses. Internally Doxygen uses the UTF-8 encoding. Doxygen uses
# libiconv (or the iconv built into libc) for the transcoding. See the libiconv
# documentation (see:
# https://www.gnu.org/software/libiconv/) for the list of possible encodings.
# See also: INPUT_FILE_ENCODING
# The default value is: UTF-8.
```

- Create a Java code with proper Doxygen-style comments. And run the Doxyfile by executing this command in the command prompt/ terminal.

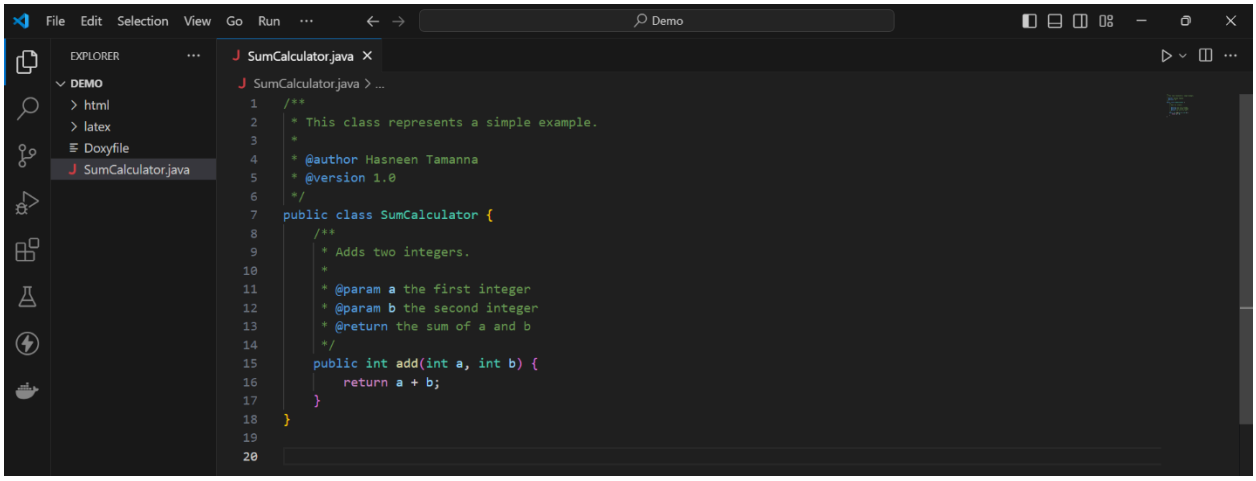
```
C:\Users\User\Desktop\Demo>doxygen Doxyfile
```

- This will create HTML or LaTeX file in your folder. And finally, you can view the documentation file by opening the **'index.html'** file.

4. Example Documentation:

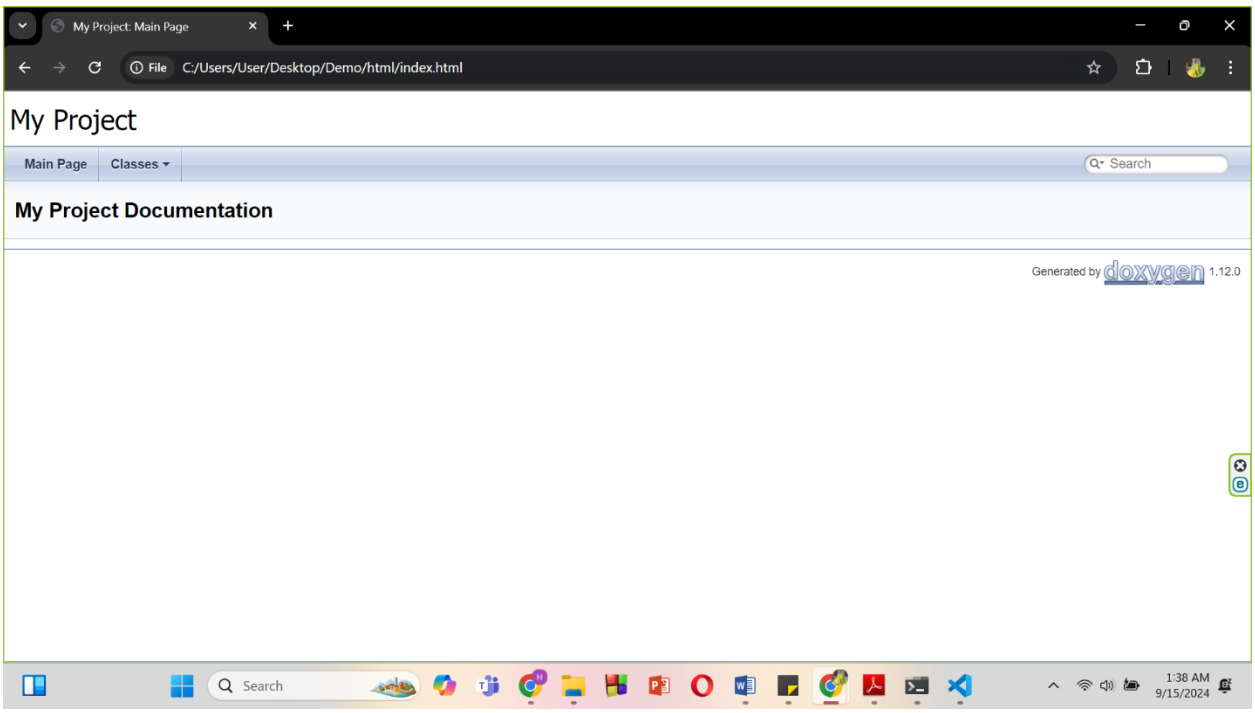
4.1. Source Code:

Here, we created a simple Java code to calculate sum of two numbers and provided necessary comments to it.



4.2. Produced Documentation:

The overview of the main page of project documentation:



The overview of the Java file for project documentation:

5. Merits and demerits

5.1. Why should we use Doxygen?

- It is easier to maintain because it automates a significant part of the documentation process.
- It helps in generating highly detailed documentation, which is ideal for complex systems.

5.2. Why should we not use Doxygen?

- Initial set-up is a complex procedure which is not a necessary effort for small projects or projects that don't require comprehensive documentation.
- It requires disciplined usage and consistent updates, which can be labor-intensive.
- It is heavy documentation tool for simple projects.

References:

1. https://youtu.be/mgVgZjaeNkw?si=q1_qRfWvScDzm0YI

2. https://en.wikipedia.org/wiki/Doxygen

3. Brief-introduction-to-doxygen

4. https://youtu.be/TtRn3HsOm1s?si=0js_xTiJ2D4HE9DO

5. Doxygen-the-importance-of-software-documentation