

SOFTWARE ARCHITECTURE ASSIGNMENT - 6

GROUP – 21

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Estimate

Read the entire assignment and calculate you estimate for the estimation assignment.

We estimate the work will be done in 12hours for both understanding and implementation, but it took more than 15 hours for completing both the parts i:e 1)PIMPL 2)Document an API

PIMPL:

Modified code to a pimpl pattern.

The screenshot shows the Visual Studio IDE with the PIMPL_DLL project open. The main editor window displays the StableClass.cpp file. The code includes the following headers and defines the ClassImpl struct, StableClass struct, and two methods: Method1 and Method2. The Solution Explorer on the right shows the project structure, including references to framework, PIMPLDLL_EXPORTS, and someContainedClass1.h and someContainedClass2.h. The status bar at the bottom indicates 'No issues found'.

```
#include "framework.h"
#include "StableClass.h"
#include "SomeContainedClass1.h"
#include "SomeContainedClass2.h"

class ClassImpl {
public:
    SomeContainedClass1* m_SomeContainedClass1;
    SomeContainedClass2* m_SomeContainedClass2;
};

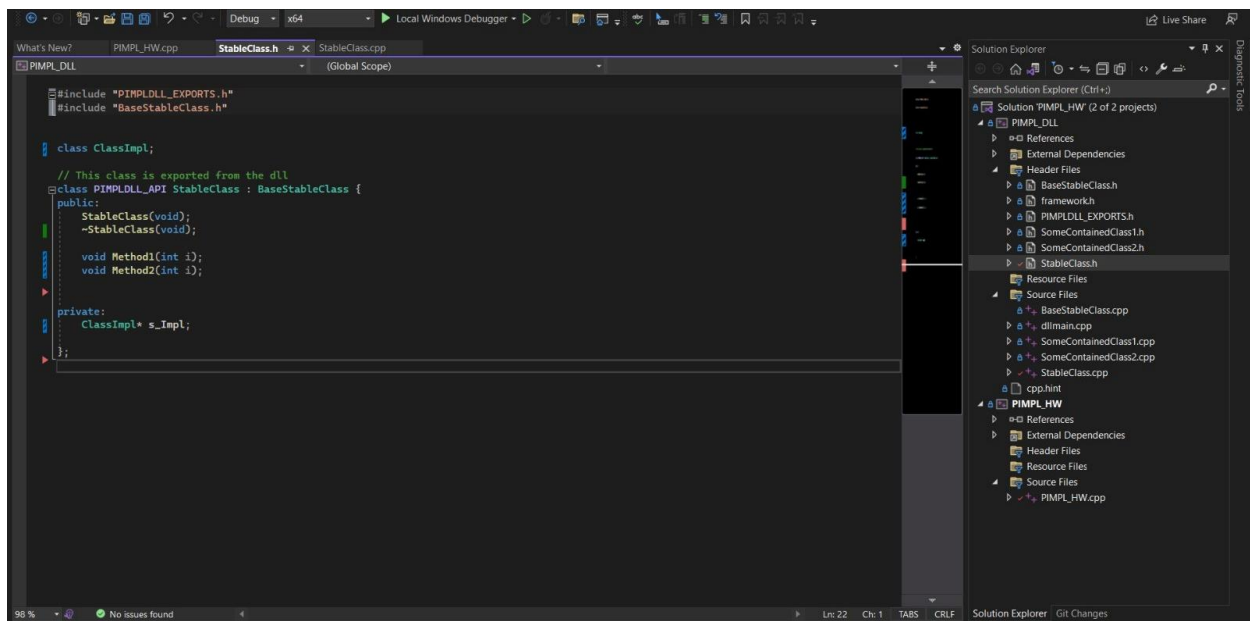
StableClass::StableClass(void) : s_Impl(new ClassImpl())
{
    s_Impl->m_SomeContainedClass1 = nullptr;
    s_Impl->m_SomeContainedClass2 = nullptr;
}

StableClass::~StableClass(void)
{
    delete s_Impl;
}

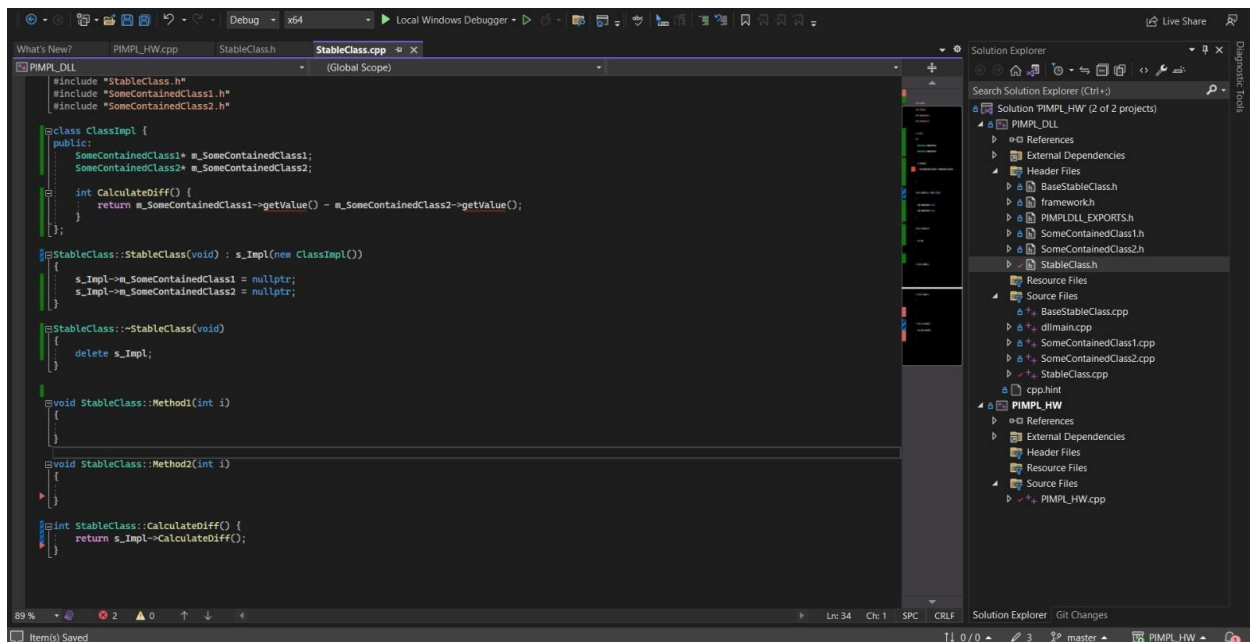
void StableClass::Method1(int i)
{
}

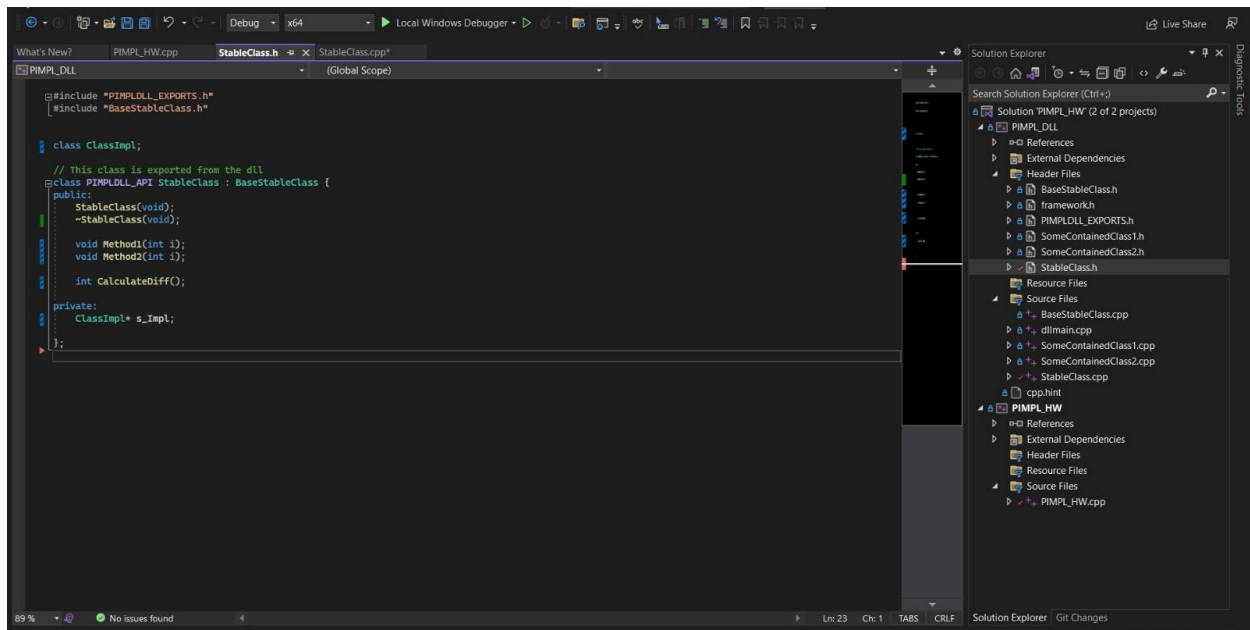
void StableClass::Method2(int i)
{
}
```

The Solution Explorer on the right shows the project structure, including references to framework, PIMPLDLL_EXPORTS, and someContainedClass1.h and someContainedClass2.h.



StableClassImpl has been updated with a new method for computing the difference between m_SomeContainedClass1 and m_SomeContainedClass2. This update will not affect the public interface of StableClass. Below is the revised code snippet:





The PIMPL (Pointer to IMPLementation) pattern is a design pattern used to separate a class's public interface from its implementation details. This is achieved by encapsulating all implementation details within a private class, with the public interface of the class merely holding a pointer or reference to this private implementation.

The primary advantages of the PIMPL pattern include:

1. **Improved Encapsulation:** By hiding implementation details within a private class, the public interface remains clean and focused solely on the class's functionality. This enhances encapsulation by preventing direct access to internal implementation details.
2. **Modularity:** Separating the public interface from implementation details promotes modularity within the codebase. Modifications to the implementation can be made independently of the public interface, reducing code dependencies and facilitating easier maintenance.
3. **Reduced Compilation Dependency:** One of the significant benefits of PIMPL is that modifications to the implementation do not require recompilation of classes that use the public interface. This can be particularly advantageous in large codebases or when distributing code as libraries, as it minimizes compilation times and reduces the risk of introducing bugs.

Overall, the PIMPL pattern offers several benefits including improved encapsulation, modularity, reduced compilation dependency, information hiding, and enhanced flexibility and maintainability, making it a valuable tool for designing robust and scalable software systems.

DOCUMENT AN API:

I have provided the zip files of the stub API project and the respective html pages of the API in the canvas submission page.

GIT Link of the API project: https://github.com/pssv7/SA_assignment

Here's an explanation of the API:

API Reference:

Session Class:

- `OpenWorkbook(string filePath)`: Opens a workbook file and returns a Workbook object.
 - Parameters:
 - `filePath` (string): The path of the file to open.
 - Returns:
 - Workbook: The Workbook object for the opened file.
 - Errors:
 - `FileNotFoundException`: If the file path provided is invalid or the file cannot be found.
 - `IOException`: If there are file permission issues or the file is in use.

Workbook Class:

- `GetWorksheet(string worksheetName)`: Gets a worksheet from the workbook with the specified name.
 - Parameters:
 - `worksheetName` (string): The name of the worksheet to get.
 - Returns:
 - Worksheet: The Worksheet object for the specified worksheet.
 - Errors:
 - `WorksheetNotFoundException`: If the worksheet name provided is invalid or the worksheet cannot be found.
- `Save()`: Saves the workbook.
 - Errors:
 - `IOException`: If there are file permission issues or the file is in use.
- `SaveAs(string filePath)`: Saves the workbook to a new file path.
 - Parameters:
 - `filePath` (string): The path of the new file to save to.
 - Errors:
 - `FileNotFoundException`: If the file path provided is invalid.
 - `IOException`: If there are file permission issues or the file is in use.
- `Close()`: Closes the workbook.
 - Errors:
 - `IOException`: If there are file permission issues or the file is in use.

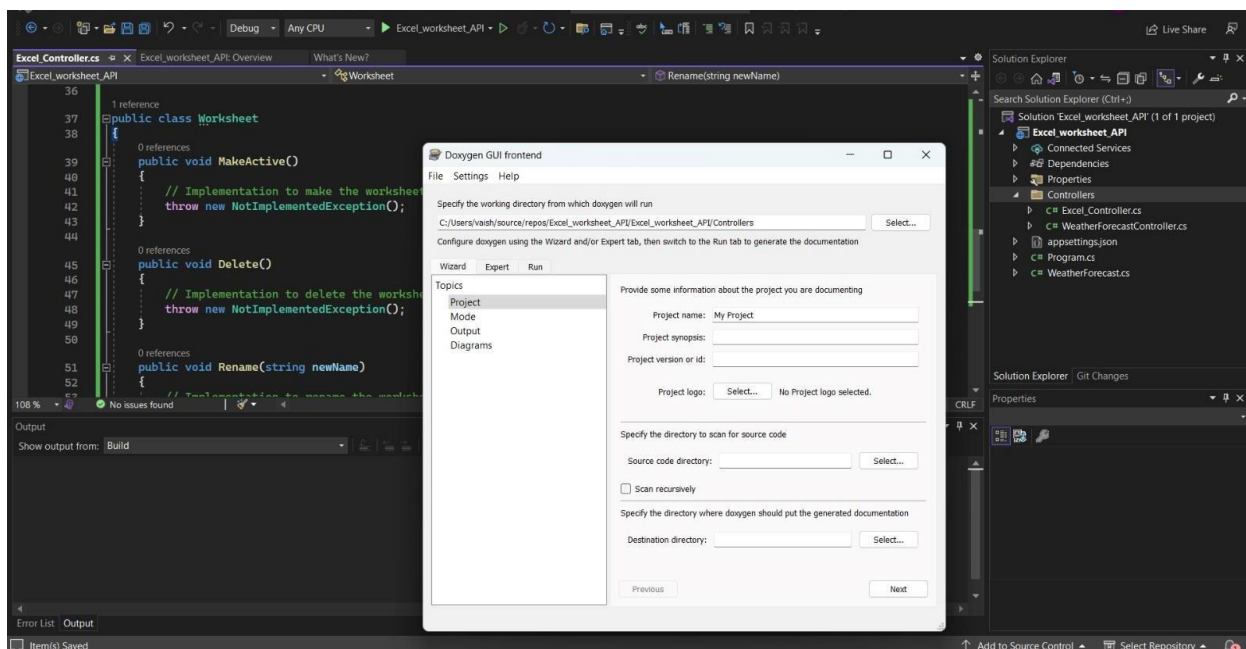
Worksheet Class:

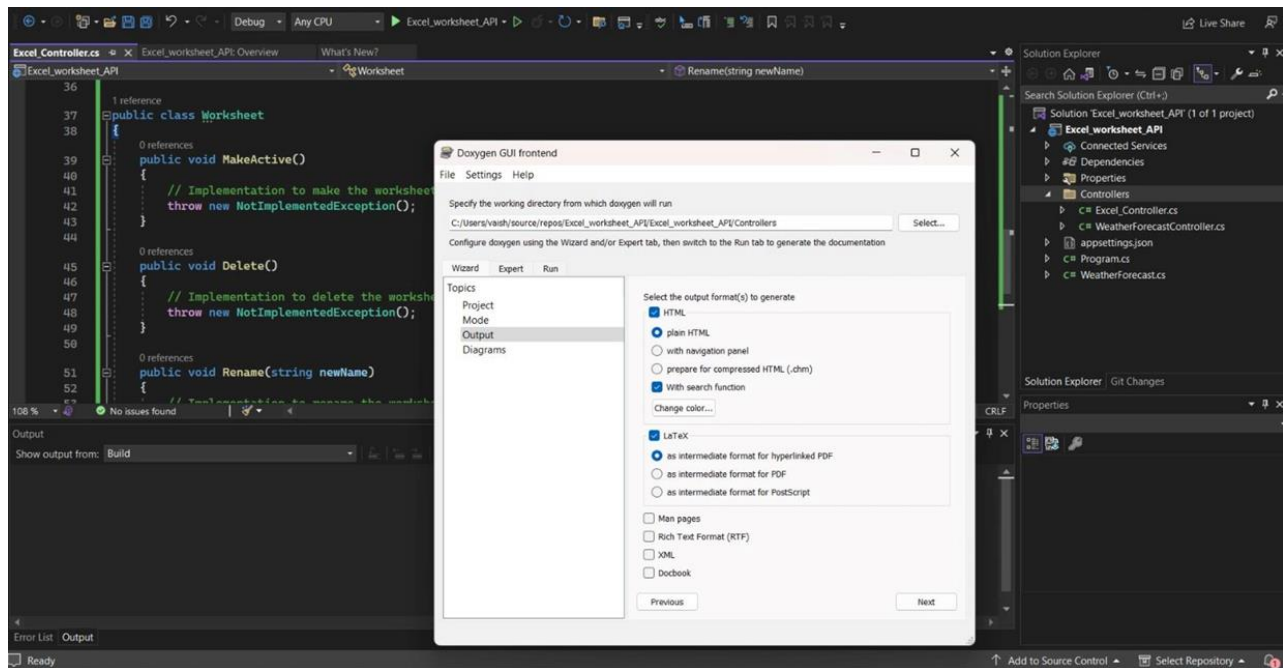
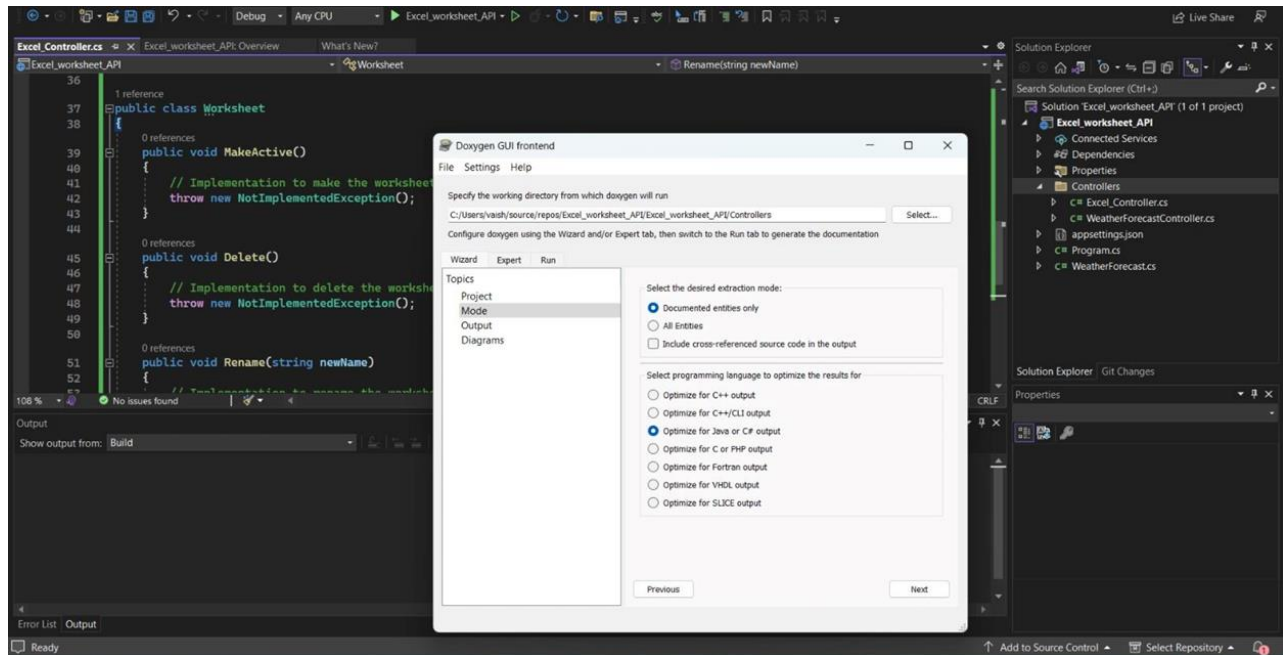
- `MakeActive()`: Makes the worksheet active.
 - Errors:
 - `ActivationException`: If there are any issues with activating the worksheet.

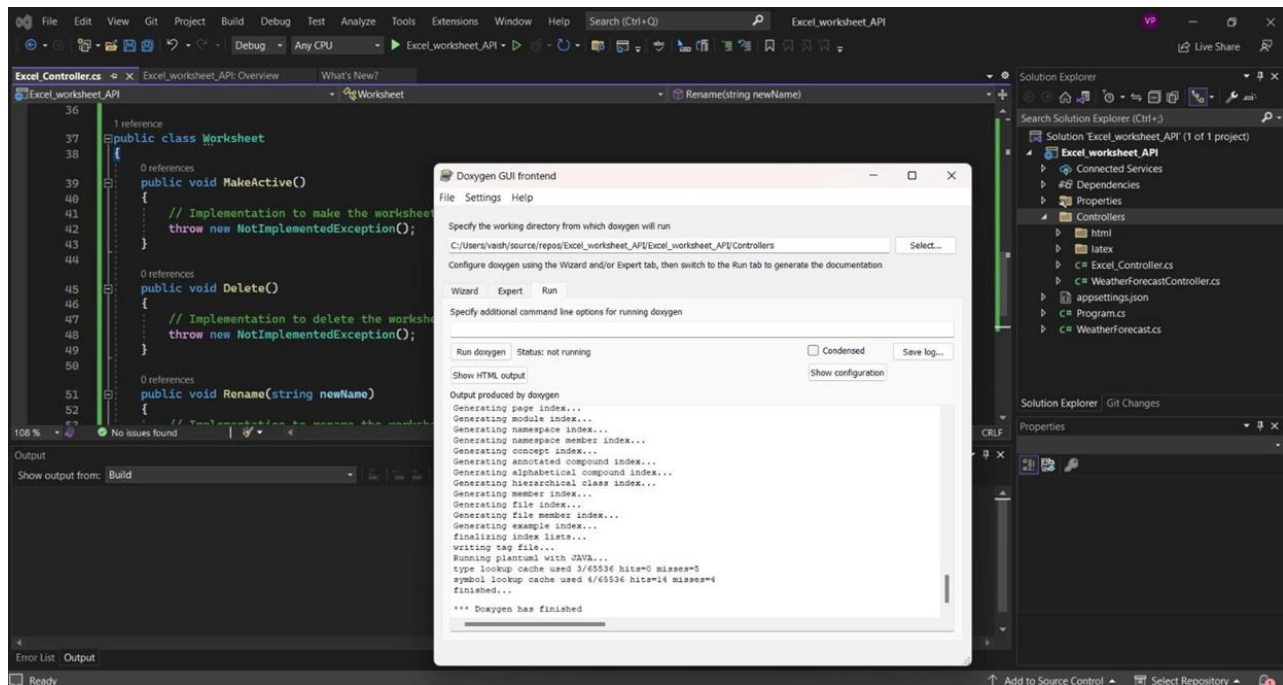
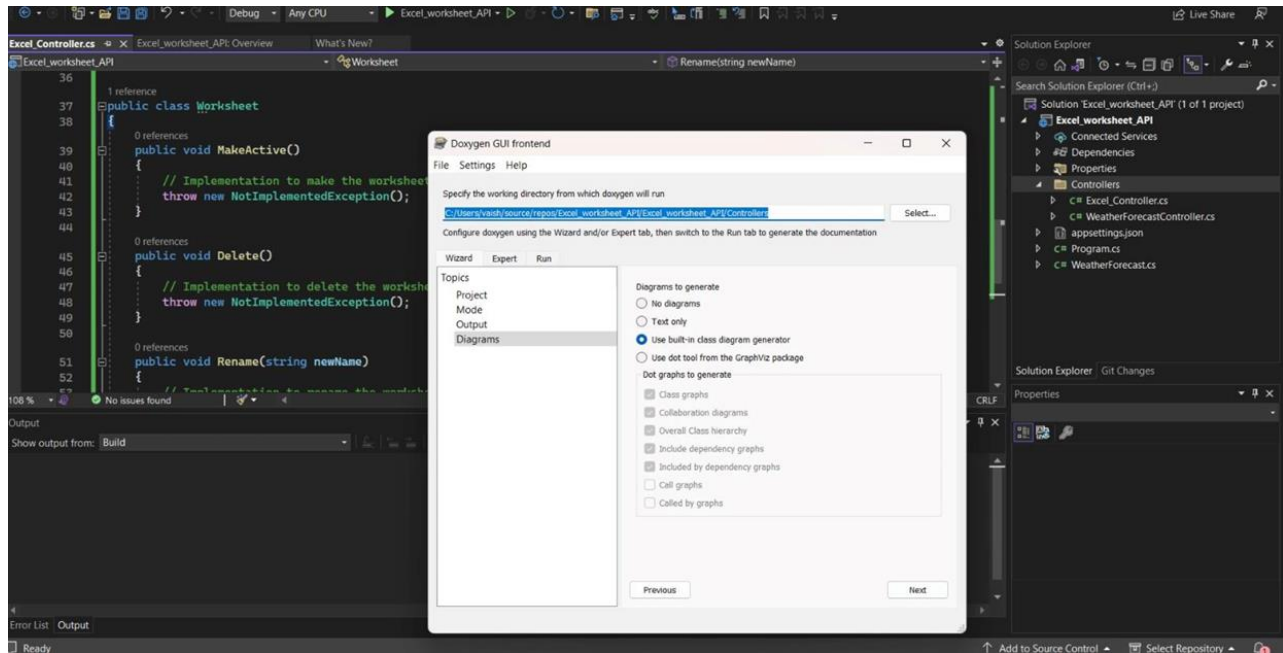
- Delete(): Deletes the worksheet.
- Errors:
 - WorksheetDeletionException: If the worksheet cannot be deleted for any reason.
- Rename(string newName): Renames the worksheet.
- Parameters:
 - newName (string): The new name for the worksheet.
- Errors:
 - WorksheetRenameException: If the new name provided is invalid or the worksheet cannot be renamed for any reason.

Summary:

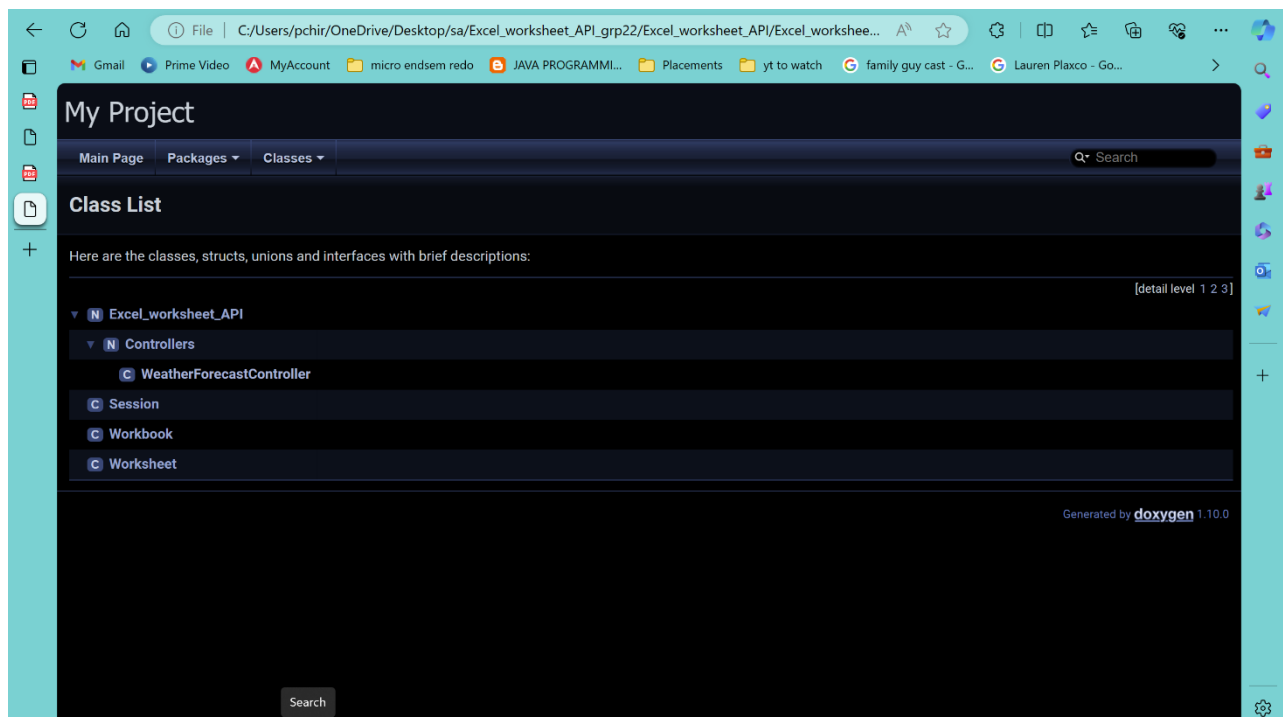
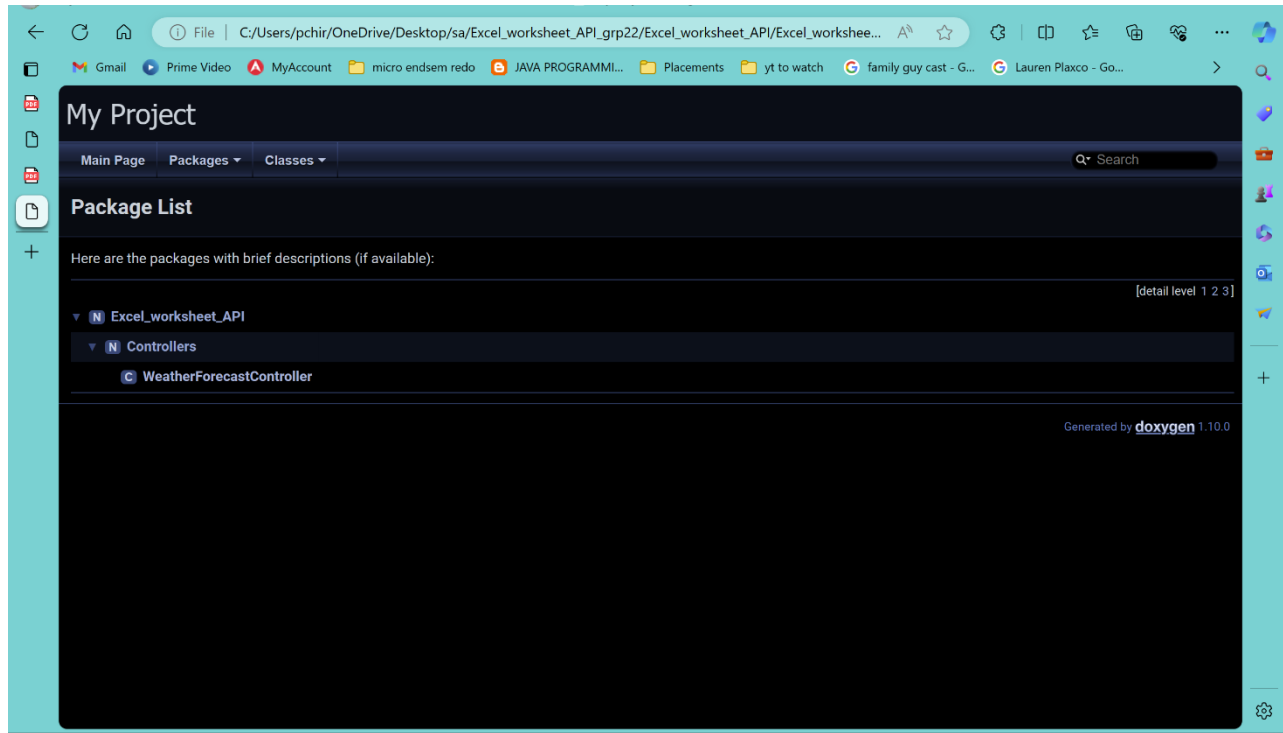
This API facilitates manipulation of sessions, workbooks, and worksheets similar to Excel. It supports operations such as opening, closing, saving workbooks, making worksheets active, deleting them, and renaming them.







Below are the few html pages that we have generated.



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📺 family guy cast - G...

👤 Lauren Plaxco - Go...

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My Project

Main Page

Packages ▾

Classes ▾

🔍 Search

Class Index

S | W

S

Session

W

WeatherForecastController (Excel_worksheet_API.Controllers)

Workbook

Worksheet

Generated by **doxygen** 1.10.0

⚙️

(REPORT) Perform Evaluation of team members Participation rubric of teammates. List out for your all team members how much they participated. This will go into your Lab report.

	Keerthana Turai	Sai Sree Vardhan Ponnuru	Total
Keerthana Turai	50	50	100/100
Sai Sree Vardhan Ponnuru	50	50	100/100