SOFTWARE ARCHITECTURE ASSIGNMENT - 6

GROUP – 21

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Sai Sree Vardhan Ponnuru – M15791597

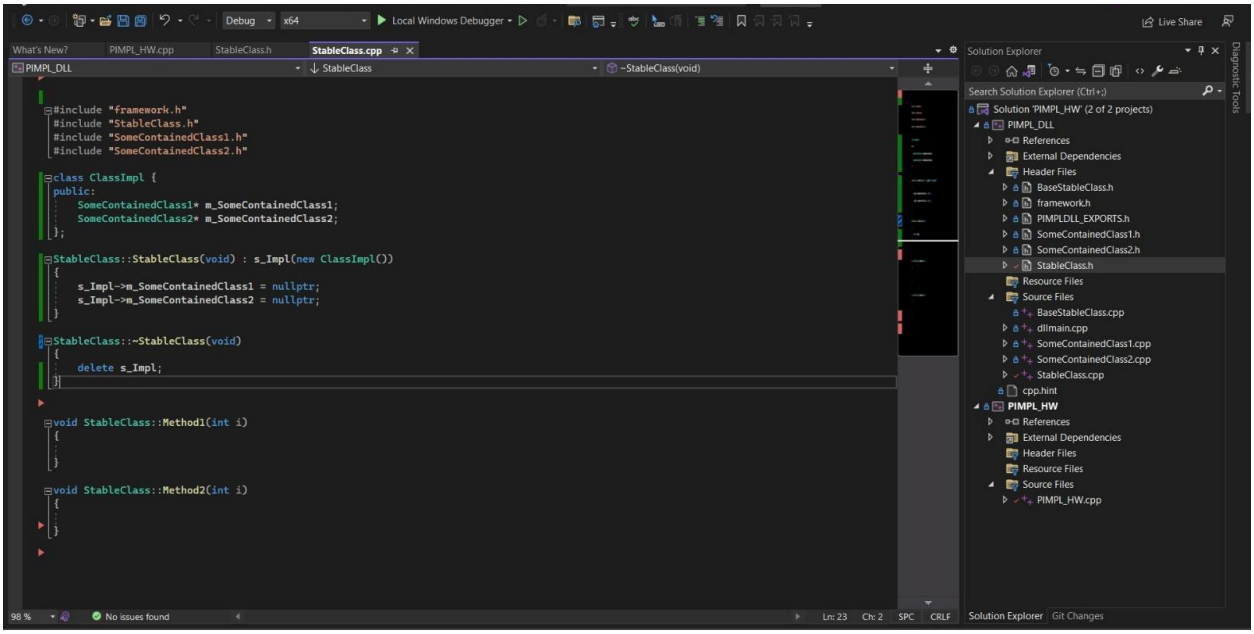
Estimate

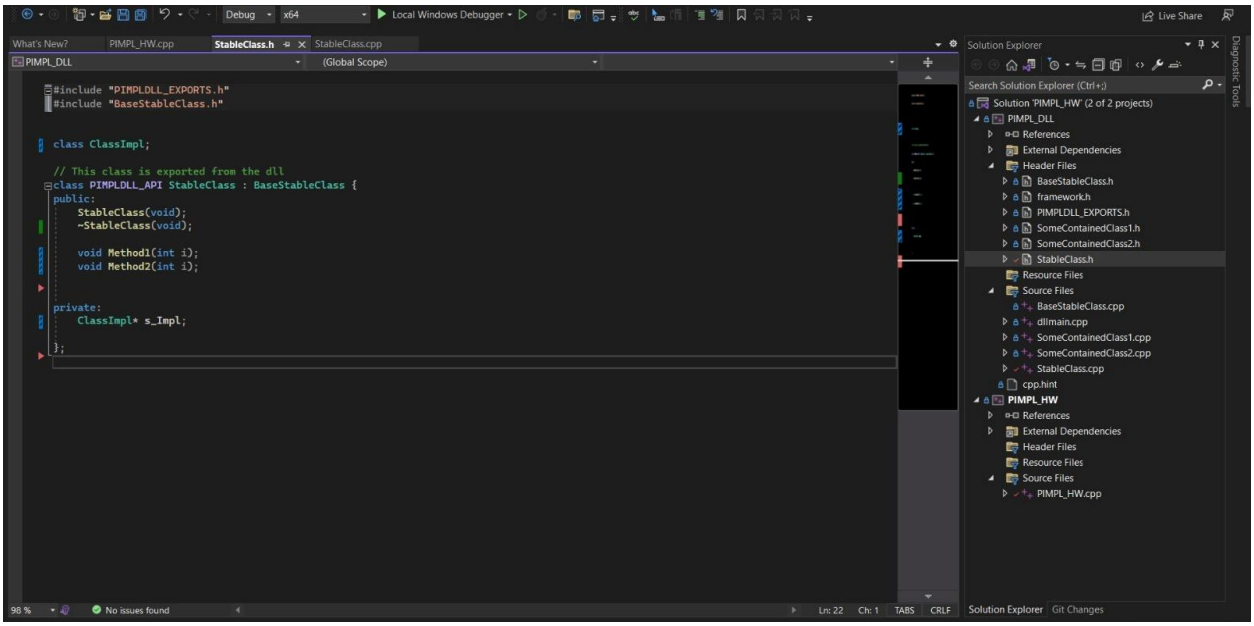
Read the entire assignment and calculate you estimate for the estimation assignment.

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

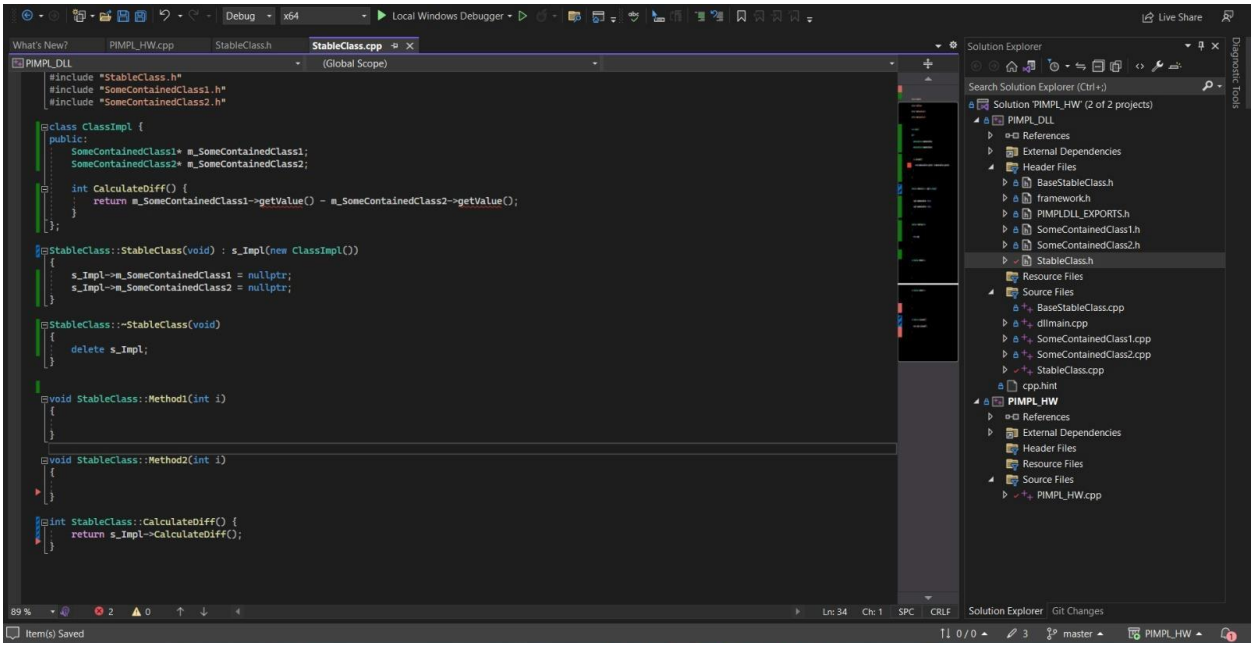
PIMPL:

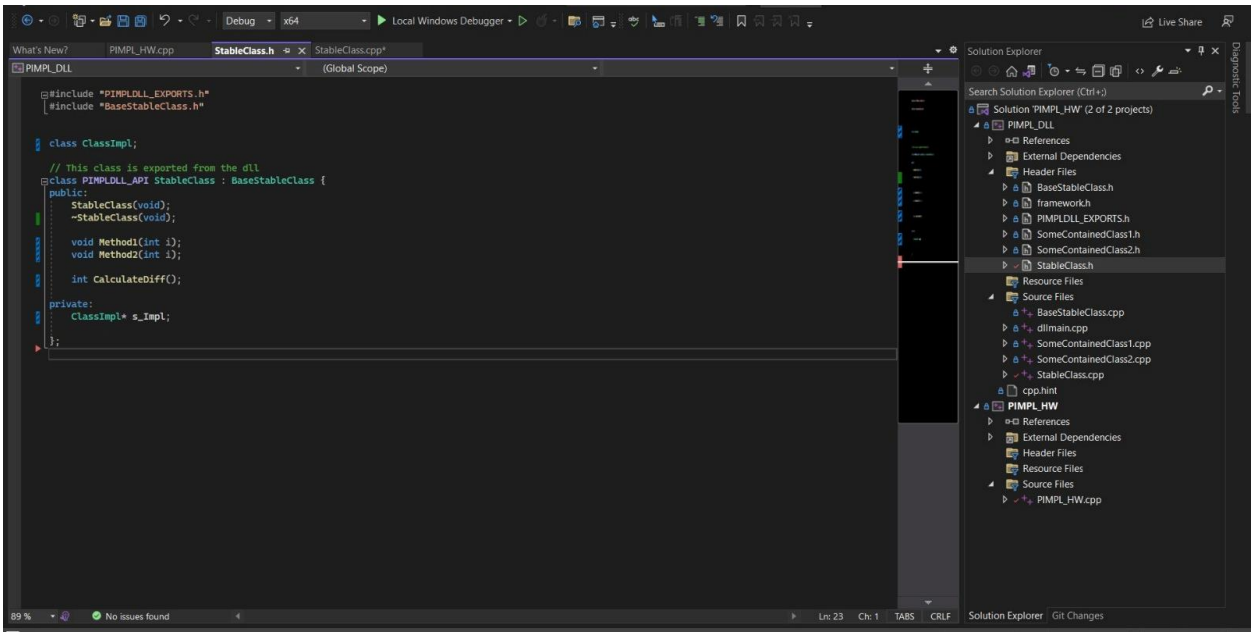
Modified code to a pimpl pattern.





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/vaishnavipolampali/Excel_worksheet_API

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.

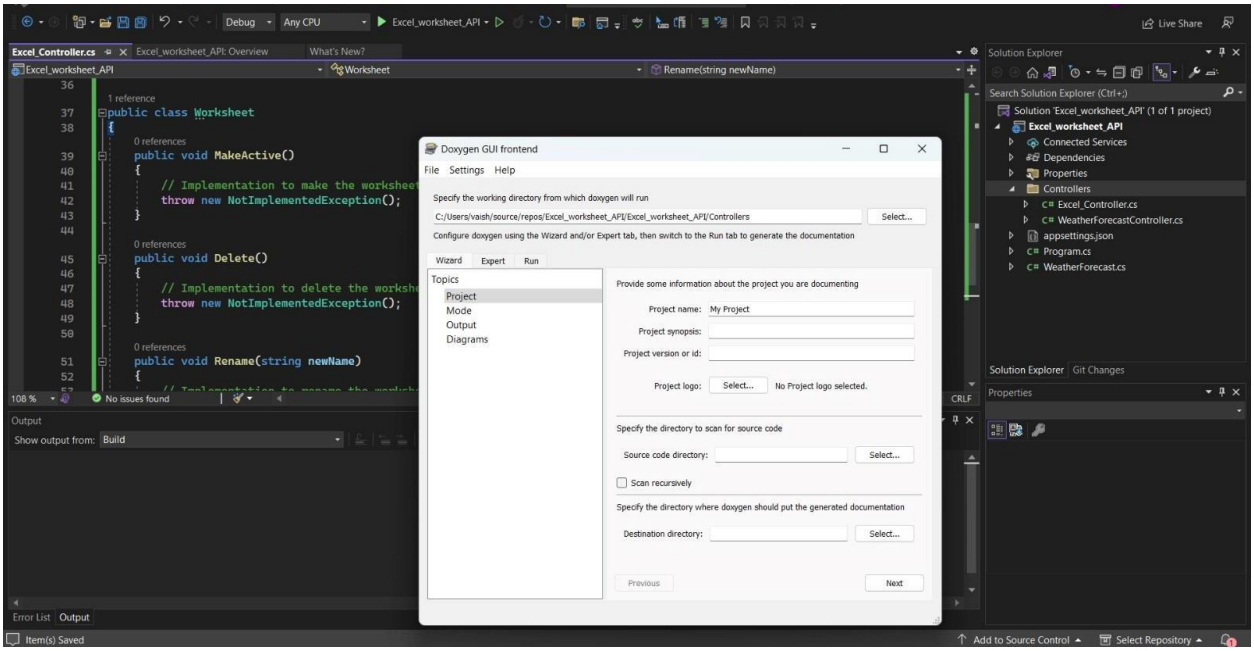
Workbook Class:
- GetWorksheet(string worksheetName): Gets a worksheet from the workbook with the specified name.
  - Parameters:
    - worksheetName (string): The name of the worksheet to get.
  - Returns:
    - Worksheet: The Worksheet object for the specified worksheet.
  - Errors:
    - WorksheetNotFoundException: 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.

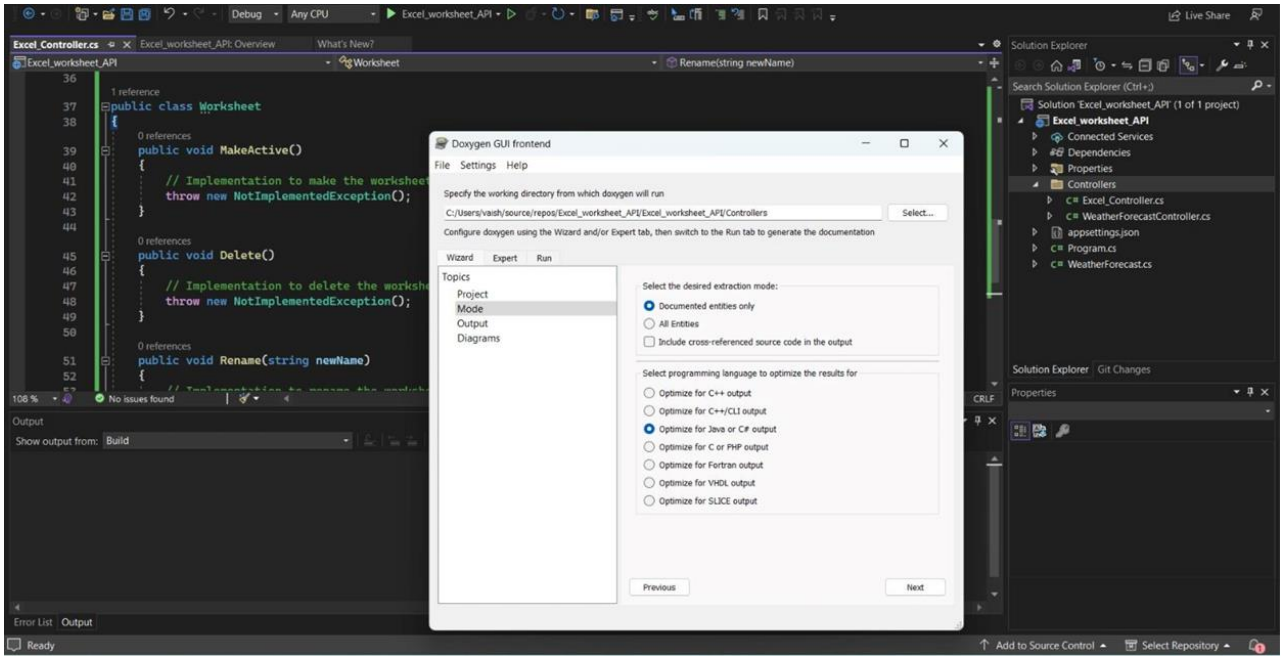
Worksheet Class:
- MakeActive(): Makes the worksheet active.
  - Errors:

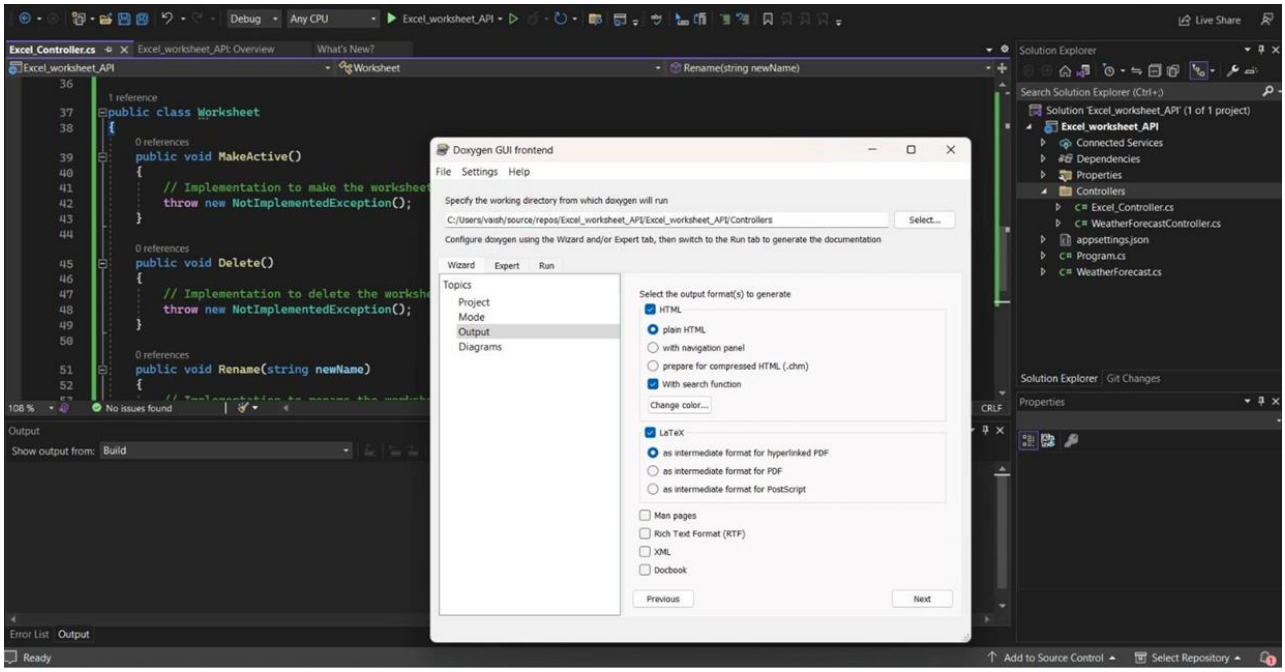
- ActivationException: If there are any issues with activating the worksheet.
- Delete(): Deletes the worksheet.
  - Errors:
    - WorksheetDeletionException: If the worksheet cannot be deleted for any reason.
- Rename(string newName): Renames the worksheet.
  - Parameters:
    - newName (string): The 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.




Excel_Controller.cs
Excel_worksheet_API: Overview
What's New?
Excel_worksheet_API
Worksheet
Rename(string newName)
1 reference
public class Worksheet
0 references
public void MakeActive()
// Implementation to make the worksheet
throw new NotImplementedException();
0 references
public void Delete()
// Implementation to delete the worksh
throw new NotImplementedException();
0 references
public void Rename(string newName)
No issues found
Output
Show output from: Build
Error List
Output
Ready
Add to Source Control
Select Repository
Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution 'Excel_worksheet_API' (1 of 1 project)
Excel_worksheet_API
Connected Services
Dependencies
Properties
Controllers
Excel_Controller.cs
WeatherForecastController.cs
appsettings.json
Program.cs
WeatherForecast.cs
Solution Explorer
Git Changes
Properties
Doxygen GUI frontend
File
Settings
Help
Specify the working directory from which doxygen will run
C:/Users/vaish/source/repos/Excel_worksheet_API/Excel_worksheet_API/Controllers
Select...
Configure doxygen using the Wizard and/or Expert tab, then switch to the Run tab to generate the documentation
Wizard
Expert
Run
Topics
Project
Mode
Output
Diagrams
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
Previous
Next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Excel_Controller.cs
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Doxygen GUI frontend
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Help
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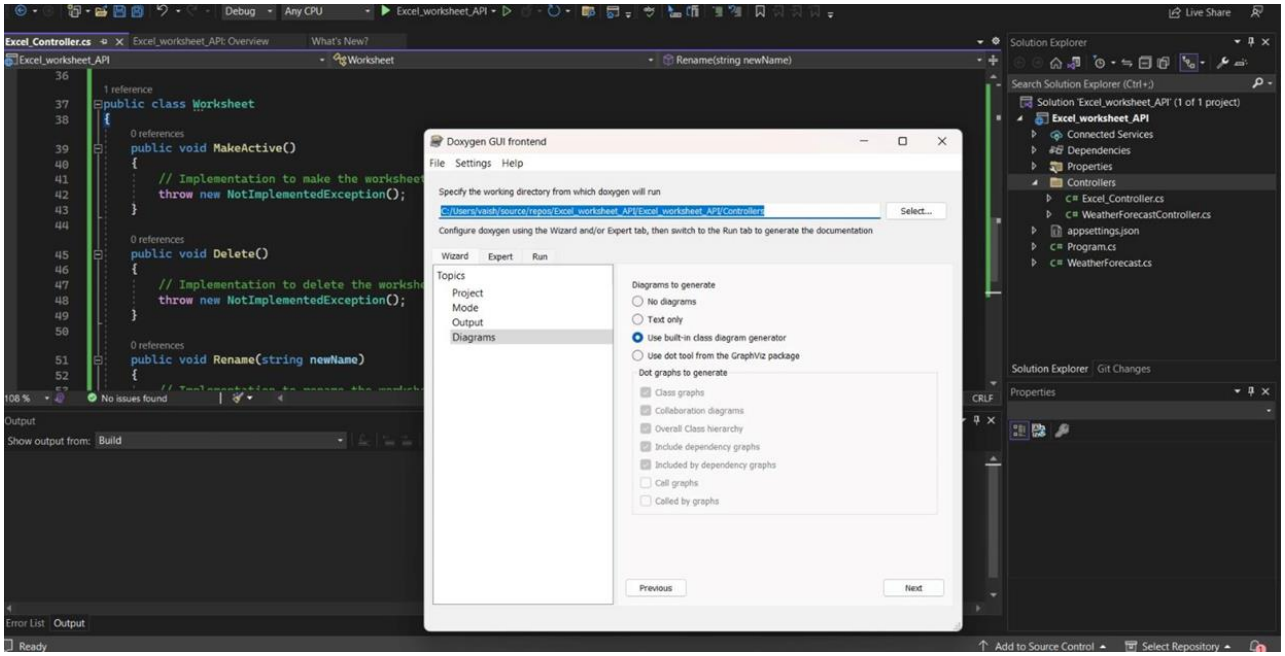
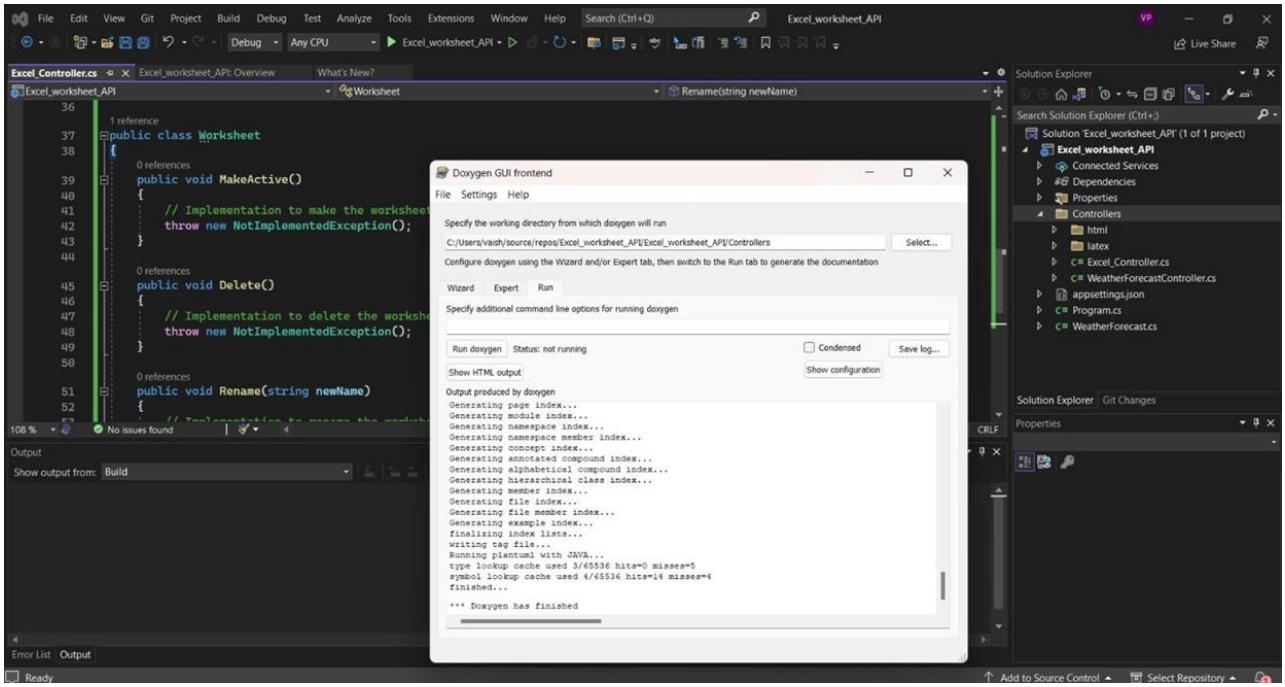
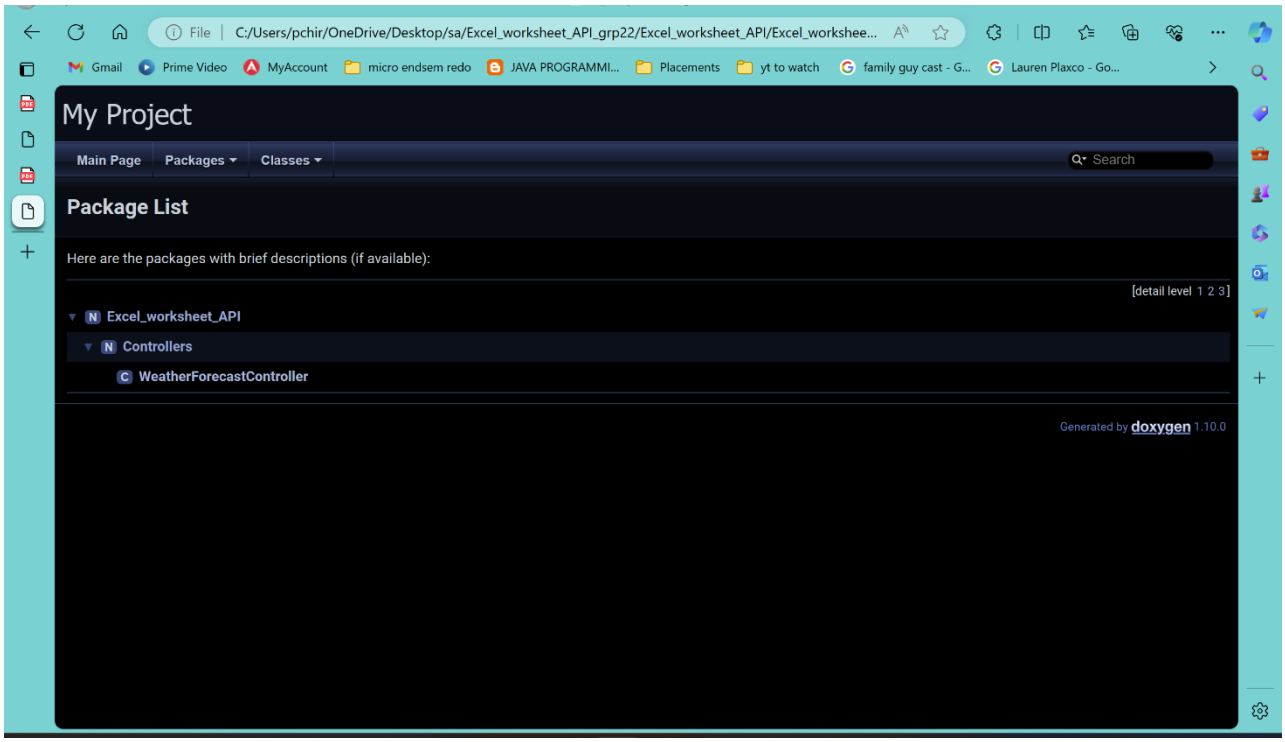
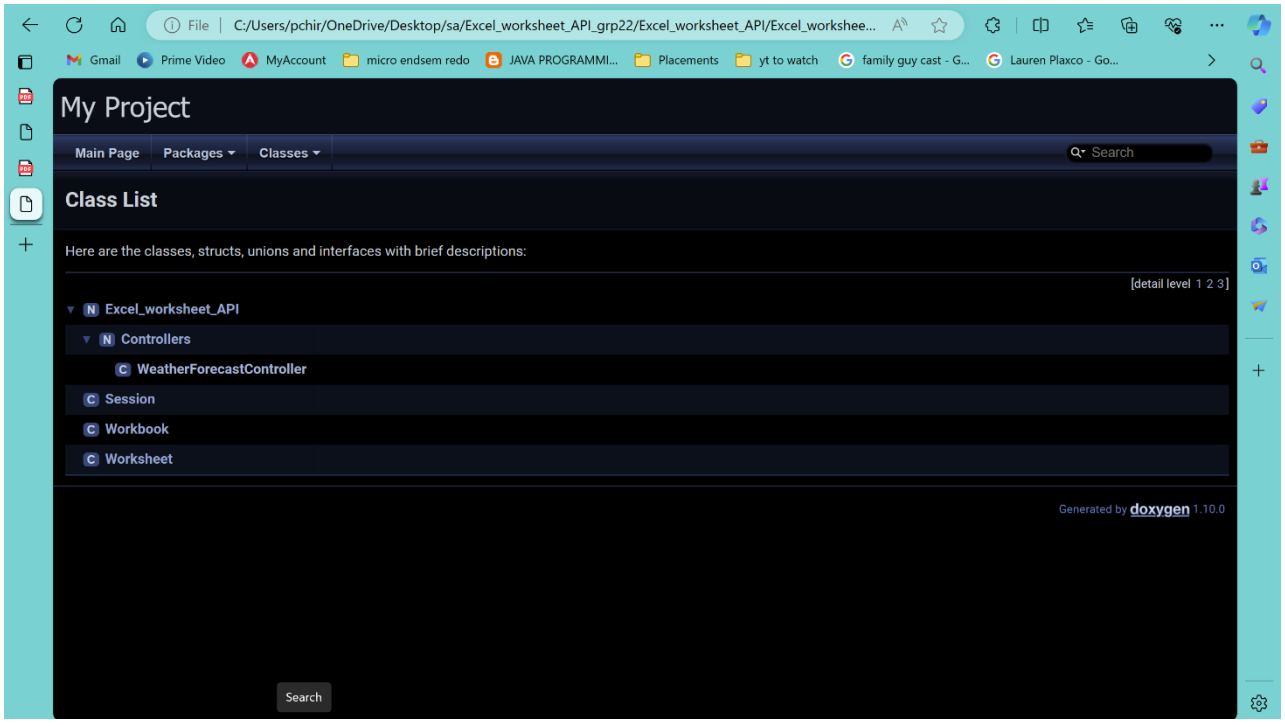
Select...
Configure doxygen using the Wizard and/or Expert tab, then switch to the Run tab to generate the documentation
Wizard
Expert
Run
Topics
Project
Mode
Output
Diagrams
Select the output format(s) to generate
HTML
plain HTML
with navigation panel
prepare for compressed HTML (.chm)
With search function
Change color...
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
Previous
Next

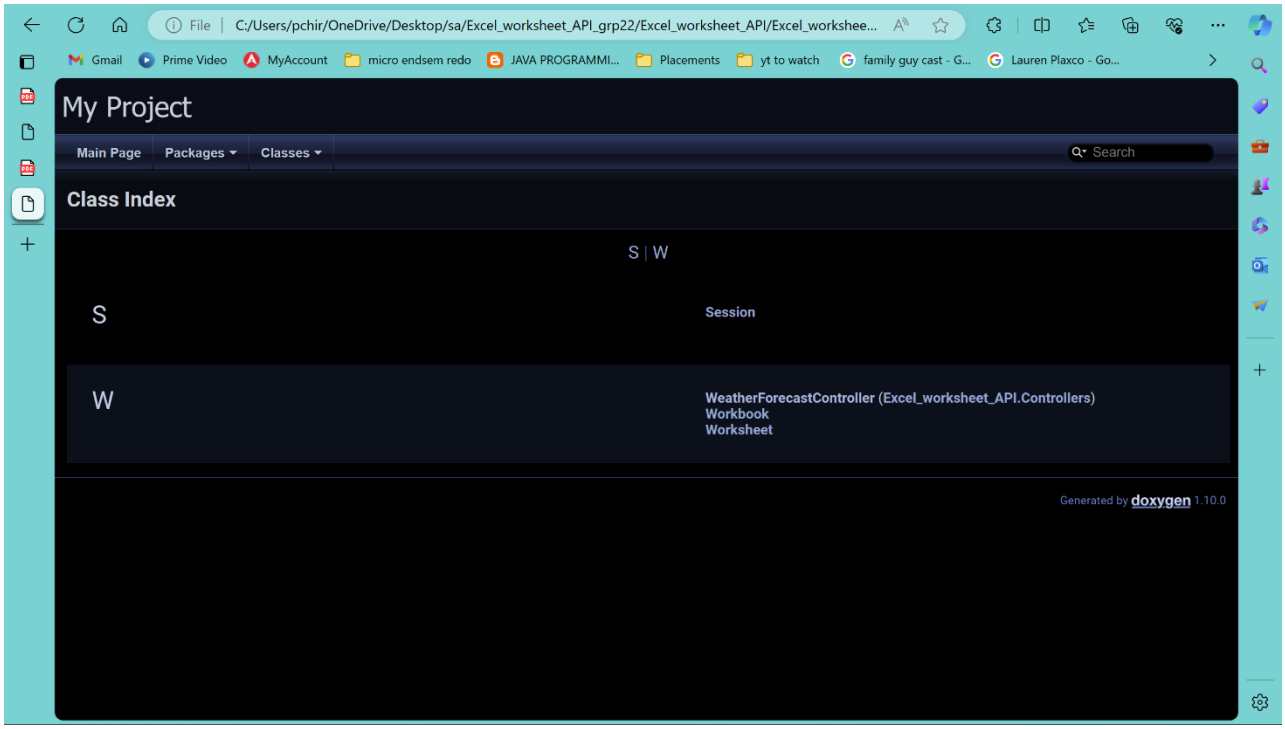

Doxygen GUI frontend
File Settings Help
Specify the working directory from which doxygen will run
C:/Users/vaish/source/repos/Excel_worksheet_API/Excel_worksheet_API/Controllers
Select...
Configure doxygen using the Wizard and/or Expert tab, then switch to the Run tab to generate the documentation
Wizard Expert Run
Topics
Project
Mode
Output
Diagrams
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
Previous
Next


Doxygen GUI frontend
File Settings Help
Specify the working directory from which doxygen will run
C:/Users/vaish/source/repos/Excel_worksheet_API/Excel_worksheet_API/Controllers
Select...
Configure doxygen using the Wizard and/or Expert tab, then switch to the Run tab to generate the documentation
Wizard Expert Run
Specify additional command line options for running doxygen
Run doxygen
Status: not running
Condensed
Save log...
Show HTML output
Show configuration
Output produced by doxygen
Generating page index...
Generating module index...
Generating namespace index...
Generating namespace member index...
Generating concept index...
Generating annotated compound index...
Generating alphabetical compound index...
Generating hierarchical class index...
Generating member index...
Generating file index...
Generating file member index...
Generating example index...
finalizing index lists...
writing tag file...
Running plantuml with JAVA...
type lookup cache used 3/65536 hits=0 misses=5
symbol lookup cache used 4/65536 hits=14 misses=4
finished...
*** Doxygen has finished

Below are the few html pages that we have generated.






File | C:/Users/pchir/OneDrive/Desktop/sa/Excel_worksheet_API_grp22/Excel_worksheet_API/Excel_workshee...
Gmail
Prime Video
MyAccount
micro endsem redo
JAVA PROGRAMMI...
Placements
yt to watch
family guy cast - G...
Lauren Plaxco - Go...
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