
Course	:	Diploma in Engineering (Electronic & Digital Engineering)
Module Title	:	Programming
Module Code	:	EG231D

Mini Project

The objective of this project is to provide learners with a platform to apply their programming knowledge by creating a real-life application. Through this project, learners will gain hands-on experience working in teams, collaborating with one another to complete the project within a specified timeframe.

1. Forming of groups

- Each team should consist of up to **TWO** learners. However, exceptions can be made with the agreement from the module tutor.
- The formation of groups aims to promote collaboration, knowledge sharing, and teamwork among learners.
- It is important for group members to work together effectively by dividing tasks and combining efforts to complete the project.
- When working on a programming project, it's important to follow the Software Development Life Cycle (SDLC) to ensure a systematic and organized approach to software development.

2. Assessment components

- There are **2 assessment components** for this project: a group report, programming codes and a project demonstration. This project carries an overall weightage of **30%**.
- The rubrics used to grade the project report (30%), program functionality (70%) will be provided.

a. Group Report

- Each team is required to submit a single report.
- The report should be typed using "Times New Roman" font, size 12, with single line spacing.
- The report should follow the guides shown below.

I. System Design

Provide Flowchart to illustrate the program design. Provide code snippets to illustrate key functionalities. (Refer to self-directed learning folder)

II. User Friendliness

Describe the functionality of your program based on your testing approach and strategies.

III. Individual Contributions

Describe the specific contributions made by each team member.

IV. Conclusion:

Reflect on the overall experience of working on the Python project.

V. References:

Cite any external sources, books, research papers, or online documentation used during the project development.

b. Programming Codes**I. Modularity and Functionality**

- The code must be organized and reusable functions to perform duplicated tasks.
- The functions have well-defined purposes.

II. Proper Data Structure and Data Manipulation

- Dictionaries and lists used appropriately to store and manipulate data.

III. User-Friendly

- The purchasing system must be easy to navigate.
- Clear instructions for the users.
- Validation and error handling for user inputs

IV. Creativity

- Learners are encouraged to demonstrate creativity to make the program user friendly.

Assessment deadline

Submission deadline: 4-Dec-2023 Monday 2359hrs

Assessments	Marks	<i>Weightage</i>	<i>Remarks</i>
Group Report		30%	
Program functionality		70%	
		Total	

Plagiarism

Plagiarism is the act of taking someone else's work or ideas, whether in whole or in part, and presenting them as your own without acknowledging the original source.

Nanyang Polytechnic (NYP) takes plagiarism seriously and considers it a form of academic dishonesty. Learner who is found to have violated [NYP Academic Integrity Policy](#) by committing an act of plagiarism during a module assessment, will be subjected to disciplinary action.

Learners would be liable for disciplinary action if they were found to provide or seek unauthorized assistance such as:

- Copying another learner's answer
- Providing another learner with answers
- Fabricating data, information or citations
- Asking another person to complete the work that you're supposed to do
- Taking and using the whole or any part of ideas, words or works of others and passing it off
- Not acknowledging the original source (including AI resource)

Please refer to [NYP Academic Integrity Policy](#) in the NYP website for the treatment on contravention of academic integrity.

Design a PSI data analytic system

To develop PSI data analytic system using Python Programming. It allows users to view historical PSI data to provide accurate analytical finding for research purpose using PSI excel data from data.gov.sg. [Historical 24-hr PSI — Data.gov.sg](https://data.gov.sg/historical-24hr-psi)

The followings are the required specifications:

1. Create a Menu to display the options as shown in the **Figure 1** below.
2. The users will be prompted to enter an option to begin the analysis of the PSI data given(e.g **Historical24hrPSI_NOV_2022.xlsx**).
3. The users can select and display highest or the lowest PSI data based on the given direction (north, south, east, west).
4. The program should be user friendly to allow the users to update the PSI value based on the **date and time** format follow by **direction** refer to **Figure 2**.
5. After updating the new PSI value, the user can select an option to save the PSI data to a new file name e.g **Historical24hrPSI_NOV_2022new.xlsx**
7. Users will be prompted again if there is error entry.
8. The figures shown are suggested output and to provide learners a clarity on what is the requirement based on the given specification. Learners are highly encourage to improve and design the program as necessary

** Dictionary/List and Function should be implement in your program.*

** Refer to Practical 4 (Question 3) and Topic 7, self-directed learning material in the brightspace*

```
*****PSI data analytic System*****
1. Display PSI reading for November 2022 in Singapore
2. To display the highest PSI reading
3. To display the lowest PSI reading
4. To update PSI reading
5. To Save PSI data file

Press any other numbers to exit
Enter your option:|
```

Figure 1: Proposed menu display option

	24-hr_psi	north	south	east	west	central
0	2022-01-11 00:00:00	22	27	25	17	20
1	2022-01-11 01:00:00	22	28	26	18	20
2	2022-01-11 02:00:00	23	29	27	18	20
3	2022-01-11 03:00:00	23	30	28	19	20
4	2022-01-11 04:00:00	24	30	29	19	20

Figure 2: *PSI data display from the Historical24hrPSI_NOV_2022*

Reference

<https://pandas.pydata.org/docs/reference/api/pandas.DataFrame.max.html>

<https://sparkbyexamples.com/pandas/pandas-dataframe-tutorial-beginners-guide/>

[Historical 24-hr PSI — Data.gov.sg](#)

-End-