# Assignment 3
## Structured Data Type

## Overview

- This assignment is to be conducted **outside of the class.**
- You will be adopting a **Pair Programming** strategy in doing this assignment.
  What is pair programming? (https://youtu.be/oBraLLybGDA)
- You and your partner will be coding collaboratively online using VS Code and **Live Share**.
- You will communicate with each other using an online meeting software such as Webex, Google Meet, etc.
- You will record the pair programming session. This requirement is compulsory.

## Pair Programming and Collaborative Coding

- Select a two-hour time slot within the given date to engage in a pair programming session with your partner.
- If necessary, split the pair programming session into multiple sub-sessions, ensuring that the total time does not exceed 2 hours.
- Document the date and time of each pair programming session in the program's source code.
- Keep a record of the meetings pertaining to your pair programming sessions. This includes documenting discussions and decisions made during the sessions. If the programming occurs over multiple sessions, ensure all meetings are recorded. No need to edit the video footage.
- While face-to-face pair programming is an option, remember to still record the session to maintain transparency and accountability.

*Notes:*

- Before engaging in the pair programming session with your partner, it is recommended that you individually explore the exercise first. This proactive approach will better prepare you for the collaborative coding experience and enhance the overall effectiveness of the session.

## Recording the Pair Programming Sessions

- Utilize any online meeting tool such as Webex, Google Meet, etc. for conducting online meetings and recording your pair programming sessions.
- Note that (if you are opting to use Webex), the free account on Webex limits meetings to 50 minutes per session. If more time is needed, open another session once the current one ends.
- Since the free account on Webex only allows local recording, ensure to record the session on your computer. Later, manually upload the videos to a cloud storage platform such as Google Drive.

**Purpose of the Video:**

- Emphasize that the video is intended for documenting the pair programming session, rather than for presentation purposes.
- It should capture the coding process, communication, and collaboration between you and your partner.
- Use English for communication.

**Video Content:**

- Display your Visual Studio Code (VS Code) interface and the output (console terminal) during the coding session.
- Ensure that your camera is turned on throughout the session to show both participants.
- You may record the session in a single video or multiple segments.
- Submit the raw, unedited videos without any post-processing.

**Uploading and Sharing:**

- Upload the recorded videos to your Google Drive or YouTube channel.
- If using Google Drive, organize multiple videos into a single folder and share only the folder link. Set permissions so that "Anyone can view" the videos.
- If uploading to YouTube, provide links to all the videos.
- Ensure that the videos remain accessible until the end of the semester.

## Plagiarism Policy Notice

While collaboration and consulting resources are encouraged, it is imperative to uphold academic integrity. Any instance of plagiarism will result in immediate dismissal of your submission. There will be no opportunity for appeal.

## Late Submission Policy and Penalties

- All submissions must be made through the designated eLearning platform. Submissions via other channels such as email, Google Drive, or Telegram will not be accepted.
- In case a program fails to compile, a penalty of 50% will be applied to the submission.
- Late submissions will incur penalties as follows: For every hour past the deadline, a penalty of 10% will be deducted.The calculation of late penalties will be rounded up to the nearest hour. For example, a submission that is 1 minute late will be considered 1 hour late.

## Problem

| weights | 0.15 | 0.20 | 0.30 | 0.35 |
|---|---|---|---|---|

| student name | exercise | assignment | test | exam |
|---|---|---|---|---|
| Aina Faris | 85.5 | 90.0 | 78.5 | |
| Amirul Hakim | 88.0 | 76.5 | 92.0 | |
| Siti Nur Aisyah | 91.0 | 89.5 | 85.0 | |
| Muhammad Irfan | 77.0 | 82.5 | 79.5 | |
| Nurul Izzati | 84.0 | 87.0 | 90.5 | |

Consider the above table that displays the marks earned by students in a class, assessed through four types of evaluations: exercises, assignments, tests, and exams. Each assessment has a specific weightage, shown in the "Weights" row. All values are expressed as percentages. To calculate each student's total score, multiply the percentage values by their respective weights.

Write a C++ program based on the given requirements to represent this table using arrays and a structured data type. The program should include code that fulfills the following tasks:

1. Define a constant array that stores the weights of the assessments.
2. Define a structured data type to represent each row of the table, including:
    - The student's name
    - An array to hold the marks for exercise, assignment, test, and exam, earned by the student

- The total score

3. Using the structured data type defined earlier, define an array to store a list of students. Initialize the array with the provided data from the table, leaving the exam marks and total scores uninitialized.

4. Using appropriate loops, populate the exam score for each student with user inputs.
5. Using separate loops, calculate the total score earned by each student.
6. Finally, display the complete table with all the data on the screen.

The following figures illustrate expected output from the program. Bold texts indicate user input.

*Expected output from the program*

```
Enter the exam mark for the student Aina Faris =>58

Enter the exam mark for the student Amirul Hakim =>51

Enter the exam mark for the student Siti Nur Aisyah =>92

Enter the exam mark for the student Muhammad Irfan =>80

Enter the exam mark for the student Nurul Izzati =>84

-------------------------------------------------------------------------------------------
No.  Name               Exercise       Assignment     Test           Exam           Total
-------------------------------------------------------------------------------------------
1    Aina Faris         85.50          90.00          78.50          58.00          74.67
2    Amirul Hakim       88.00          76.50          92.00          51.00          73.95
3    Siti Nur Aisyah    91.00          89.50          85.00          92.00          89.25
4    Muhammad Irfan     77.00          82.50          79.50          80.00          79.90
5    Nurul Izzati       84.00          87.00          90.50          84.00          86.55
```

## Assessment

This exercise carries **7%** weightage for the final grade of this course. The breakdown weightage is as follows (out of 100 points):

| Criteria | Points |
|---|---|
| **1. The code** | |
| a. Task 1 | 10 |
| b. Task 2 | 15 |
| c. Task 3 | 15 |
| d. Task 4 | 10 |
| e. Task 5 | 10 |
| f. Task 6 | 10 |
| **2. Pair Programming** | |
| a. Overall | 10 |
| b. Active collaboration | 10 |
| c. Both members play both roles Driver and Navigator. | 10 |

**Notes:**Pair programming and the video are compulsory. If your source code submission is not accompanied by the video, your assignment will not be assessed..

## Submission

- Deadline: As specified on eLearning
- Only one member from each pair needs to do the submission.
- Submission must be done on eLearning. Any other means such as email, telegram, google drive will not be accepted at all.
- You will need to submit TWO (2) items:
    a. Source code: submit only the source code file, e.g. `main.cpp`. Write your name and your partner's in the source code.
    b. The video link of your pair programming session. Write the link in the source code.

## FAQs

1. **Who will be my partner?**

   You will choose your partner on your own.

2. **Can I do the exercise alone?**

   This is only allowed if the number of students in the class is not even. You also need to ask for permission from the lecturer.

3. **Do we need to switch roles between Driver and Navigator?**

   Yes. Your video should show that you and your partner keep switching between these two roles. No one should be dominant or play only one role.

4. **What if we do pair programming physically (face-to-face)?**

   You and your partner should use only one computer and sit side-by-side. You do not have to open LiveShare and online meetings. You can record the video locally using software like OBS. Again, you still need to talk and discuss with your partner in the video. It is also compulsory to turn on the web camera.