COMP642 Advanced Programming
Semester 2 2024

Object Oriented Programming Assignment 1

Worth:	15%
Due:	**Friday, 09 August 2024 5:00 p.m.**
Late Penalty:	Work not received by the due time attracts an immediate penalty of up to 25% of the marks available. No work will be accepted after **Sunday, 11 August 2024 5:00 p.m**.
Submission:	Zip your completed files and submit the .zip through the link on COMP642 LEARN page.

This is an **individual** assessment. You must not collaborate or confer with others. You may help others by verbally explaining concepts and making suggestions in general terms, but without directly showing or sharing your own code. You must develop the logical structure, the detail of your code and the database on your own, even if you are working alongside others. Code that is copied or shares a similar logic to others will receive zero marks for both parties.

The use of Artificial Intelligence (AI) tools, such as ChatGPT, to complete this assessment is **prohibited**. Assessment answers will be analysed for evidence of the use of AI and penalties may be administered.

The University policy on Academic Integrity can be found here.

Scenario

You are tasked with designing and implementing a system in Python using object-oriented programming to manage tech workshops for Lincoln Tech, an industry association in the technology sector that offers limited-seating, high-demand, hands-on workshops.

Classes

Develop the **required classes** as detailed in the specifications below.

The design of each class must follow object-oriented principles, particularly focusing on abstraction and encapsulation. All attributes should be private, accessible only through public getter and setter methods. Each class must include:
- Private data members
- Getter and setter methods

- __init__() method
- Methods specific to the class
- __str__() method

Required Classes

1. The **TechWorkshop** Class: represents a single tech workshop organised by Lincoln Tech. A workshop has a default fee set at $1050 and a maximum capacity capped at 20 participants.
   - Attributes: **(8 marks)**
     - The name of the tech workshop.
     - The instructor assigned to conduct the workshop (an object of the Instructor class).
     - The fee amount for the workshop ($1050).
     - The maximum capacity of the workshop (20).
     - The date of the workshop.
     - A list of participants (objects of the Participant class) enrolled in the workshop.
     - A list of participants (objects of the Participant class) who are on the waitlist for the workshop.
     - A list of participants (objects of the Participant class) who attended the workshop.
   - Methods:
     - Assign an instructor to conduct the workshop. **(2 marks)**
     - Enrol a participant in the workshop. If the workshop is full, the participant will be added to the waitlist. **(3 marks)**
     - Display all participants currently enrolled in the workshop. **(2 marks)**
     - Return the number of participants currently enrolled in the workshop. **(2 marks)**
     - Return the number of available slots for enrolment in the workshop. **(2 marks)**
     - Remove a participant from the enrolled list of the workshop. **(2 marks)**
     - Calculate and return the total payment received for the workshop based on the number of enrolled participants and the workshop fee. **(3 marks)**
     - Mark a participant's attendance for the workshop. **(2 marks)**
     - Calculate and return the attendance percentage for the workshop, representing the ratio of participants attended to the total number of enrolled participants. **(3 marks)**

2. The **Instructor** Class: represents an instructor conducting the tech workshops.
   - Attributes: **(4 marks)**
     - The full name of the instructor.
     - The expertise or speciality of the instructor.
     - The instructor's years of experience in the field.
     - A list of all tech workshops (objects of the TechWorkshop class) assigned to the instructor.
   - Methods:
     - Display the instructor's full profile, including name, expertise, and experience. **(2 marks)**
     - Display the list of tech workshops assigned to the instructor. **(2 marks)**

– Add a tech workshop to the list of workshops assigned to the instructor. **(2 marks)**

3. The **Participant** Class: represents an individual who participates in tech workshops.
   - Attributes: **(5 marks)**
     – The full name of the participant.
     – A unique registration number for the participant.
     – The participant's email address.
     – A list of tech workshops (objects of the TechWorkshop class) in which the participant is enrolled.
     – A list of tech workshops (objects of the TechWorkshop class) in which the participant is on the waiting list.
   - Methods:
     – Book enrolment in a tech workshop. If the workshop is already full, the participant will be added to the waitlist. **(2 marks)**
     – Unenroll from a tech workshop. **(2 marks)**
     – Display all booked tech workshops. **(2 marks)**

Each class must ensure that data is private, include getter and setter methods, have an __init__() method, and feature a __str__() method. **(2 marks each)**

Driver Program

Write a driver program to simulate the management of tech workshops for Lincoln Tech. You do not need to provide a graphical user interface for this program; just use input and print statements.

The driver program must be able to perform the following functionalities: **(2 marks each)**

- Create 2 TechWorkshop objects
- Create 6 Participant objects.
- Create 2 Instructor objects.
- Assign an instructor to each tech workshop.
- Set up at least 5 participant bookings for each tech workshop.
- Cancel a participant's enrolment in a specific tech workshop.
- Record 2 specific participants checking into a tech workshop.
- Display the number of available slots for a tech workshop.
- Display the waiting list for a tech workshop.
- Display the list of enrolled participants for a tech workshop.
- Display the number of participants enrolled in a tech workshop.
- Display the number of waitlist participants in a tech workshop.
- Display the number of attendees for a tech workshop.
- Display the attendance percentage for a tech workshop.
- Display the total payment collected for a tech workshop.
- Display the list of workshops hosted by a particular instructor along with the full profile details of the instructor.
- Display the list of tech workshops for which a specific participant is enrolled.

Marking Criteria

Criteria	Marks (out of 100)	Mark Range
TechWorkshop Class	**31**	Marks will be assigned using the following criteria: All requirements met (81% - 100%) Some requirements met (51% - 80%) Minimum requirements met (1% - 50%)
Instructor Class	**12**	
Participant Class	**13**	
Driver Program	**34**	
Coding style, comments, and clear logic	**10**	Excellent coding style, relevant comments, and clear logic (8-10) Acceptable coding style with some comments, and logic is reasonable (5-7) Poor coding style, minimal comments, and unclear logic (1-4)
Total	**100**	