Object Oriented Programming Lab

Lab 02 **Marks 05**

Instructions

Work on this lab individually. You can use your books, notes, handouts etc. but you are not allowed to borrow anything from your peer student.

Marking Criteria

Show your work to the instructor before leaving the lab to get some or full credit.

What you must do

Program the following tasks in your C++ compiler and then compile and execute them.

Task 01

Write a program that **computes** and **displays** the **charges** for a **patient's hospital stay**. First, the program should ask if the patient was **admitted** as an **in-patient** or an **out-patient**. If the patient was an **in-patient**, the following data should be entered:

1. The number of days spent in the hospital
2. The daily rate
3. Hospital medication charges
4. Charges for hospital services (lab tests, etc.)

The program should ask for the following data if the patient was an **out-patient**:

1. Charges for hospital services (lab tests, etc.)
2. Hospital medication charges

The program should use **two overloaded functions** *(named charges)* to **calculate the total charges**. **One** of the functions should **accept arguments** for the **in-patient data**, while the other function **accepts arguments** for **out-patient** information. Both functions should **return the total charges**. Write your **main** function and test the functionality of your application.

Task 02

Implement the following **functions** having the prescribed functionalities.

Function	Functionality
getData	Accept an integer **array** with its **size** as function's argument and **fill** its elements with the data **entered** by the user.
displayData	Accept an integer **array** with its **size** as function's argument and **display** its **contents** on the screen.
countEvens	Accept an **array** with its **size** as function's argument and **returns** the **count of even numbers** exist in that array. The function should **NOT** perform any **input/output**.
mean	Accept an **array** with its **size** as function's argument and **returns** the **mean** of its elements. The **mean** of a sequence of **n** numbers is the number **m** defined by the formula $$m = \frac{x_0 + x_1 + x_2 + x_3 + \cdots + x_{n-1} + x_n}{n}$$ The function should **NOT** perform any **input/output**. The calculated **mean (m)** can be a *real number*, so chose your function's return type wisely.

In **main** function declare an **array of 10 integers** named **data** and pass this array to **functions** implemented above. Display the **count of even numbers** and **mean** returned by the functions. **DO NOT** perform any **input** in **main** function.

Task 03

Write a program that lets the user to **enter data in a 4×4 matrix** of **integers**, and then **calculate** the **transpose** ***(A^T: where A is a matrix and T is indicating its transpose)*** of that matrix. The **transpose** of a matrix is simply a **flipped version** of the original matrix which can be obtained by *switching its rows with its columns*.

The program should **display** the contents of **original matrix** and its **transpose**.

☺ ☺ ☺ **BEST OF LUCK** ☺ ☺ ☺