

Object Oriented Programming Lab

Lab 00B**Marks 00**

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 1

The formula for converting a **temperature** from **Fahrenheit to Celsius** is

$$C = \frac{5}{9} (F - 32)$$

where **F** is the **Fahrenheit temperature** and **C** is the **Celsius temperature**. Write a function named **Celsius** that accepts a **Fahrenheit temperature** as an **argument**. The function should **return** the **temperature, converted to Celsius**. Demonstrate the function by calling it in a **loop** that **displays a table** of the **Fahrenheit temperatures 0 through 20** and their **Celsius** equivalents.

Task 2

Write a program that lets the user to **enter 10 integers** into an array. The program should **add pairs of elements together**, starting with elements at index 0 with 1, 2 with 3, 4 with 5 and so on. **Save** all the results into a separate array and **display** the values of resulting array.

For example, the input array with values

{1, 2, 3, 4, 5, 6, 7, 8, 9, 10} results in the output array as {3, 7, 11, 15, 19}.

Task 3

Ahmed is a student of Mathematics and finds it difficult the **addition of two matrices**. You must help him by giving a program that receives the elements of **two 3 x 3** matrices from him and **store** the **result of the addition of both the matrices** into third matrix and **display** its contents. The program calls the following **functions**, to be implemented by you:

getData – accept a **matrix** with its **size** and **fill** it with the data entered by the user.

display – accept a **matrix** with its **size** and **display** its contents on the screen.

sum – accept three **matrices** with their **sizes**, **add first two matrices** and **store** the **result** in the **third**.

Task 4

Write a **function** named **wordCounter** that accepts a **string** as an **argument** and **returns** the **number of words** contained in the string.

For instance, if the string argument is **“Four score and seven years ago”** the function should **return** the number **6**.

Demonstrate the function in a program that **asks the user to input a string** and then **passes it to the function**. The **number of words** in the string should be **displayed** on the screen.

Task 5

Imagine you are developing a software package that requires users to **enter their own passwords**. Your software requires that users' passwords meet the **following criteria**:

- The password should be **at least six characters long**.
- The password should contain **at least one uppercase** and **at least one lowercase letter**.
- The password should have **at least one digit**.

Write a program that **asks for a password** and then verifies that it meets the stated criteria. If it doesn't, the program should display a message **telling the user why?**