University of Central Punjab

Faculty of Information Technology

Object Oriented Programming
Fall 2022

Lab 02	
Topic	Revision Lab, separation of interface and implementation
Objective	The basic purpose of this lab is to revise some preliminary concepts of C++ that has been covered in the course of Introduction to Computing and Programming Fundamentals. Its objective is to recall previously learned basic concepts like revision of arrays and functions. **It introduces the concept of separate interface and implementation**.

Instructions:

- Indent your code.
- Comment your code.
- Use meaningful variable names.
- Plan your code carefully on a piece of paper before you implement it.
- Name of the program should be same as the task name. i.e. the first program should be Task_1.cpp

Students are required to complete the following tasks in lab timings.

Task 1:

Using the concept of implementation in three files coding using Visual Studio, Write a class with a student name that contains student data his/her rollno, name, city and cgpa as private data members and create a two function having name of input_information(); to take data in the data members of the class and also display data using a member function display_student_data(); after doing it for one student data then you have to manage the same data for the whole class, assuming that there is a class of 5 students minimum. And you also have to enter the 5 subjects details along with every student and to enter the marks of those subjects. After entering the data of the students, you have to enter a roll_no of a student, the data of that corresponding student should be displayed. You have to do this program in three different files.

Task 2:

Write a class that contains a string, you have to enter a string using a member function input_alphabets(); and then use a convert function `Convert_To_Uppercase` that converts all of its letters to uppercase (Hint: Use a character array to store the sentence. You can also add checks for invalid characters). **You have to perform this task in three different files.**

Sample Input

```
        Object oriented programming is so cool!
```

<u>Expected Output</u>

```
        OBJECT ORIENTED PROGRAMMING IS SO COOL!
```

Task 3:

Write a C++ function `Average` which takes an array and its size as parameters and returns its average.

Task 4

Create a file data.txt with positive integers as given below. Write a function that reads integers one by one and separates them into two dynamic arrays, say evenArray, oddArray. **Regrow** both the arrays. Stop reading the numbers when **0** is found in the file.

Data.txt   1 5 6 2 3 4 5 8 2 7 1 3 9 5 6 0 5 6 8 3 5 6 4 8

Note: Do not read all the numbers in an array. Create dynamic arrays and regrow.

Lab Task 5:

Create a `struct` called Student which has registration no, name, admission date and cgpa as member variables. Create a dynamic array of type **Student**.

1. Write a function `Input_Records` for getting record of a student. Also write a function Display to print contents of the `struct` **student** on screen.
2. Write a function that stores the list of student's information in a text file.
3. Write a function to read the list of students from the file
4. Search and display the student's information by registration number and by name from the file.
5. Display all the students' information that are admitted 2 years before the current date.

Hint: Write a menu driven program. Each menu should call a separate function to perform an operation. To store date use structure "date" that contains three members namely date, month and year.

Lab Task 6:

Write a menu driven program that performs the following library operations. The menu options should be:

1. Add book information
2. Display book information
3. List all books of given author
4. Read names of 10 books in an array from user and return the sum, average, maximum and minimum of their prices stored in your file.
5. Exit

Each menu should call a separate function to perform an operation. For option 1, 2 and 3, filing is to be used.