Object Oriented Programming LAB – BSEF19

(Morning and Afternoon)

Lab 09 – 06-12-2020

An academy stores ***student number***, ***names***, ***cnic numbers***, and contact details (***phone*** and ***address***) of all of its **students** and grade them on the course basis. The students can opt any one of these courses: **Math, Computer, English**. **Math** students are examined only once at end, **Computer** students are examined from an exam (60%) and a project (40%), they are also given additional class participation marks up-to 10 provided total remain under 100%, and **English** students graded on directly by the instructor times the average rating by fellow students.

So the specific data members for math students is ***percentage marks***, computer students are ***exam marks out 50*** and ***project marks out of 20***, and English students ***teacher marks out of 100*** *and* ***average rate from student between 0.6 and 1.0***.

Your task: You have to implement class hierarchy that performs academy's gazette calculations (a list of all students with their overall percentage marks).

Note the following important points:

1. You must focus on inheritance here, ignore composition and aggregation for this task.
2. You must implement all required constructors and destructors.
3. To save time, make data members public to avoid writing of getters/setters and input/output functions and may provide implementation ***any two of derived classes*** of **Employee**.
4. You may have to create a class **Gazette** to compose/aggregate ***Students***
5. You MUST have to write driver code (or main function) for sufficient hard coded student's data.

This lab has resemblance with shapes3.cpp in the following ways:

1. **Students** class corresponds to shape class, the base of derived classes **Math**, **Computer**, or **English**.
2. Each of the class **Math**, **Computer**, or **English** has a function **calculateOPM** to compute overall percentage marks, like area function in Rectangle and Circle classes
3. **Gazette** class is like the Canvas class with various arrays and their filled counts.

Bonus task: Update your code if all the student belongs to any of the following cities: Lahore: 0 kilometers away, Kasur 20 kilometers away, and Faisalabad 70 kilometers away. [it is an aggregation]