CL-1004
Object Oriented Programming
Lab No 8

Objectives:
- Composition
- Aggregation

Note: Carefully read the following instructions (*Each instruction contains a weightage*)

1. There must be a block of comments at start of every question's code by students; the block should contain brief description about functionality of code.
2. Comment on every function and about its functionality.
3. Mention comments where necessary such as comments with variables, loop, classes etc to increase code understandability.
4. Use understandable name of variables.
5. Proper indentation of code is essential.
6. Write a code in C++ language.
7. Make a Microsoft Word file and paste all of your C++ code with all possible screenshots of every task **output in Microsoft Word and submit word file. Do not submit .cpp file.**
8. First think about statement problems and then write/draw your logic on copy.
9. After copy pencil work, code the problem statement on MS Studio C++ compiler.
10. At the end when you done your tasks, attached C++ created files in MS word file and make your submission on Google Classroom. (Make sure your submission is completed).
11. Please submit your file in this format **20F1234_L1**.
12. Do not submit your assignment after deadline. Late submission is not accepted.
13. Do not copy code from any source otherwise you will be penalized with negative marks.

Problem 1: Composition

Create a class Time with following data members and member functions

```cpp
public:
    Time();
    Time(int, int);
    void setTime(int, int);
    void getTime(int&, int&);
    void printTime();
private:
    int hr;
    int min;
```

Create a class Date with following data members and member functions

```cpp
public:
    Date();
    Date(int, int, int);
    void setDate(int, int, int);
    void getDate(int&, int&, int&);
    void printDate();

private:
    int month;
    int day;
    int year;
```

Create a class Event with following data members and member functions

```cpp
public:
    Event(int hours = 0, int minutes = 0, int m = 1,
          int d = 1, int y = 1900, string name = "Christmas");
    void setEventData(int hours, int minutes, int m, int d, int y, string
name);
    void printEventData();

private:
    string eventName;
    Time eventTime;
    Date eventDay;
```

Write a Main and create events using the above classes to demonstrate composition.

Problem 2: Death Relation

Implement the death relation using car as a whole class and engine, wheel, window, door and tires as a part classes.

Problem 3: Aggregation

Implement the person address problem with respect to aggregation. You need to make your code in such a way that 3 persons living on a same address

Problem 4: Aggregation

Implement the person teacher problem with respect to aggregation. You need to make your code in such a way that if teacher object is destroyed still person exists.

Problem 5:

Mention at-least five examples of composition and five examples of aggregation with proper explanation.

Problem 6: Association

Implement the doctor and patient code in such a way that a single doctor has multiple patients and single patient can visit multiple doctors.

Proper code indentation will hold extra marks !

Best of luck ☺

You are done with your exercise, submit on classroom at given time.