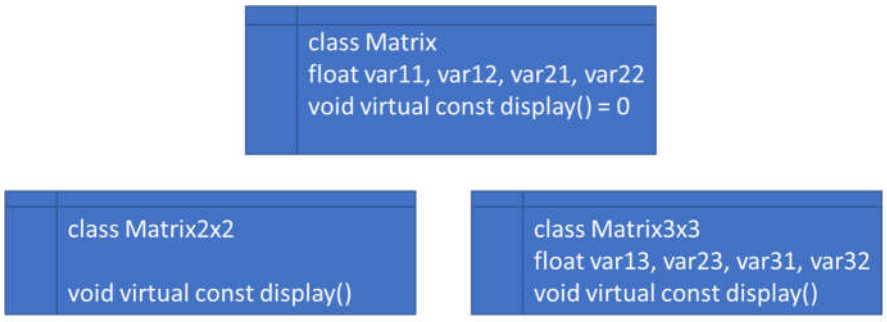
Object Oriented Programming Assignment 2

Deadline 17th April 2022, 11:59 PM

Total: 50 points

Guidelines:

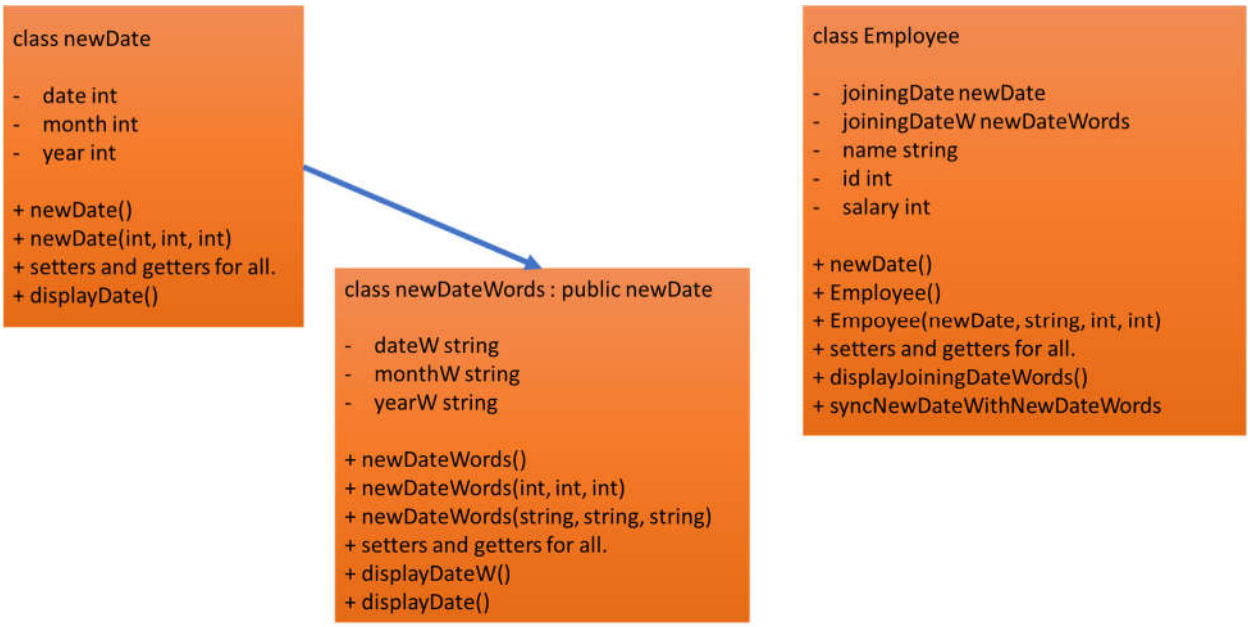
- Submission must include:
  - A doc file which contains all the codes in sequence of their questions.
  - Code files (.cpp) zipped in a folder. Each file should have name with student ID, Assignment and Question number. For example: "K211234-A1-Q1.cpp", "K211234-A1-Q2.cpp" format.
  - Output screenshots must be included for each question with name "K211234-A1-Q1-output.jpg", "K211234-A1-Q2-output.png" format. You can take screenshot by pressing windows + printscreen buttons. You can have multiple screenshots for a single question.
  - **Each output must contain your ID and name on the screen.**
- Plagiarism is punishable with zero grades in the task.
- ***Late submissions are not allowed at all.***



1. Write a program to implement inheritance as given in the diagram. Following items are required but you can also add more if it seems fit to you. [30 marks]
   a. Must have parameterized and default constructors which print your ID and name also. [3 marks]
   b. Include setters and getters to retrieve and set values. [3 marks]
   c. Implement display function to display data in matrix form. Each matrix should be accompanied with your ID and name. [3 marks]
   d. Implement addition of two matrices which returns final matrix. [3 marks]
   e. Implement subtraction of two matrices which returns final matrix. [3 marks]
   f. Implement multiplication of two matrices which returns final matrix. [3 marks]

g. Write a main function which asks user to choose from 2x2 or 3x3 matrix. Get matrix members and ask user to perform which operation. After user selects operation, such as add, subtract or multiply, print original matrices first and then the resultant matrix. [3 marks]

h. Add global functions (*void myFun2x2(Matrix2x2 &), void myFun3x3(Matrix3x3 &)*) which accepts these matrices as argument and changes their values using your student ID. For instance, your ID is 21k-1234 then run a for loop starting from first half of ID (12) till the second half (34). In every iteration, consider four digits of your ID as 2x2 matrix and perform add operation. If original argument passed to the function is 3x3 matrix then your four digits can be accompanied with zeroes in the remaining positions. Also, the global function should be able to access private members of the matrix class. **[9 marks]**



2. Write a program for employee management system where basic program structure should be as given in the diagram. Following items are to be added or updated as described. [20 marks]

a. Implement these classes with all members as described. The default constructor of the Employee class should assign default value by considering your name, id as in student ID, salary as in your paid fees amount this year, and joining date would be your first day of the university. Also, add a functionality to count number of employees created. Also, add a main function which tests all of the following functionalities such as ==, or ++, or <, etc. [5 marks]

b. Add overloaded operator == in newDate class so that it accepts two arguments of Employee objects and it can compare joining dates of two employees, and return employee object which is senior. [5 marks]

c. Add overloaded operator ++ and -- with newDateWords class, so that it can be used to increment or decrement joining date of an employee by one day. Use syncNewDateWithNewDateWords function to synchronize both types of date in that employee object. [5 marks]
d. Add two overloaded operators > and < in the Empoyee class so that it compares salaries and joining dates of two employees. It returns Boolean values if the statement is true or false. For example, obEmployee1 > obEmployee2 will compare and return true if obEmployee1 has highest salary and oldest joining date as compare to the obEmployee2. It should be noted that comparison of newDate objects will also require operator overloading of > and < in newDate class. [5 marks]