EAST WEST UNIVERSITY
Department of Computer Science and Engineering
B.Sc. in Computer Science and Engineering Program
Mid Term I Examination, Spring 2022 Semester

Course: **CSE 110-Object Oriented Programming, Section-4**
Instructor: **Tanni Mittra, Senior Lecturer, CSE Department**
Full Marks: **30 (15 will be counted for final grading)**
Time: **1 Hour and 30 Minutes**

Note: There are **5 (five)** questions, answer ALL of them. Course Outcome (CO), Cognitive Level, and Mark of each questionnaire are mentioned at the right margin.

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1. An ISBN-10 (International Standard Book Number) consists of 10 digits: The last digit, is a checksum, which is calculated from the other nine digits using the following formula: [CO1, C2, Mark: 4]

$$(d_1 \times 1 + d_2 \times 2 + d_3 \times 3 + d_4 \times 4 + d_5 \times 5 + d_6 \times 6 + d_7 \times 7 + d_8 \times 8 + d_9 \times 9) \% 11$$

If the checksum is 10, the last digit is denoted as X according to the ISBN-10 convention. Write a program that prompts the user to enter the first 9 digits and displays the 10-digit ISBN (including leading zeros). Your program should read the input as an integer.

2. Design a class named Account that contains: [CO1, C3, Mark: 6]

- A private int data field named id for the account (default 0).
- A private double data field named balance for the account (default 0).
- A private double data field named annualInterestRate that stores the current interest rate (default 0). Assume all accounts have the same interest rate.
- A private Date data field named dateCreated that stores the date when the account was created.
- A no-arg constructor that creates a default account.
- A constructor that creates an account with the specified id and initial balance.
- The accessor and mutator methods for id, balance, and annualInterestRate.
- The accessor method for dateCreated.
- A method named getMonthlyInterestRate() that returns the monthly interest rate.
- A method named getMonthlyInterest() that returns the monthly interest.
- A method named withdraw that withdraws a specified amount from the account.
- A method named deposit that deposits a specified amount to the account.

3. a. Create a Main class "CheckAcc". Inside the main method of the Main class create n number of objects of the Account class. [CO1, C3, Mark: 10]

b. Now create a static method inside the Main class " Boolean CompareTo(Account a1, Account a2)" which will take any two objects of Account type and return true if annualInterestRate of the two objects are the same and return false otherwise.

c. Now create a static method inside the Main class " Boolean Equals (Account a1, Account a2)" which will take any two objects of Account type and return true if the balance of the two objects are the same and return false otherwise.

d. Before executing the operation mentioned in 3(a), if we declare the balance variable of the Account class as a static variable then what will be the impact of these two objects? Explain with your own words.

e. Is it possible to call the Account (int id, double balance) constructor from the Account ()constructor? If yes then please write that specific part of the code where we can call Account (int id, double balance) from Account ().

4. Write a java program that will take a text as input and convert the text into tokens. Sample output is given below: [CO1, C3, Mark: 4]

Input: I love java programming.

Output: I
love
java
programming.

5. Consider the following marks of Mid1, Mid2. Final, lab, and quiz exam of five students. [CO1, C3, Mark: 6]

Name	Mid1	Mid2	Final	Lab	Quiz
Aditri	20	15	8	14	12
Sammyo	10	19	12	5	14
Nandan	15	14	4	12	10
Riad	9	8	20	6	14
Rayan	14	20	14	20	15

Write a program in Java that uses the above-mentioned dataset. Use a method named *processExamResult()* that takes data of a particular exam and prints the name of the student who obtained the highest and lowest marks in the exam. Sample output is given below

Mid1-Highest: Aditri Lowest: Riad
Mid2-Highest: Sammyo Lowest: Riad
Final-Highest: Riad Lowest: Aditri
Lab-Highest: Rayan Lowest: Riad
Quiz-Highest: Rayan Lowest: Nandan