In this MID assignment, you have to answer all 4 questions in handwritten and submit the hard copy on next Class (26.09.24). Cheating will cause a major penalty of marks.

Marks: 10 + 10 + 5 + 5 = 30.

Ques no 1:

Consider a scenario where you are tasked with designing a basic library management system using object-oriented programming principles. Create a class named "LibraryBook" with the following attributes and methods:

Attributes / Variables:

- book_id: A public unique identifier for each book in the library.
- title: A public string representing the title of the book.
- author: A public string representing the author of the book.
- is_available: A private boolean variable indicating whether the book is available for borrowing.

Methods:

- A constructor method that initializes the book_id, title, author, and is_available attributes.
- A to_string method that prints the attributes of an object.
- A check_availability method that returns the availability status of the book.
- A borrow_book method that sets is_available to false if the book is available, and prints a message indicating whether the borrowing was successful or not.
- A return_book method that sets is_available to true, indicating that the book has been returned and is available for borrowing again.

Test/ Drive File:

- Provide a short "test_LibraryBook" demonstrating how to create an object of the "LibraryBook" class and call its methods according to the specifications.

Now, write JAVA code to implement the "LibraryBook" class and driver file according to the above specifications.

Ques no 2:

Consider a scenario where you are tasked with designing a simple banking system using object-oriented programming principles. Create a class named "BankAccount" with the following attributes and methods:

Attributes / variable:

account_number: A Public unique identifier for each bank account.

balance: A Private floating-point number representing the current balance of the account.

Methods:

- A constructor method that initializes the account_number and balance attributes.
- A to_string method that print the attributes of an object
- A get method that returns the current balance of the account.
- A set method that set balance of the account.
- A method that subtracts the specified amount from the account balance, ensuring that the account balance does not go below zero.

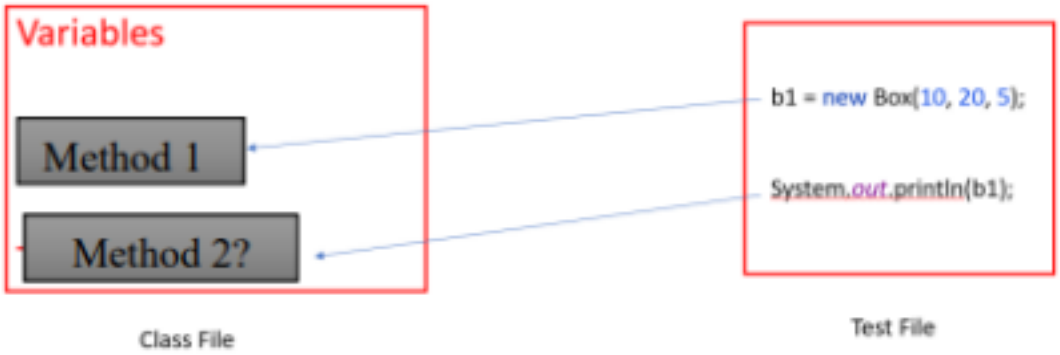
Test/ Drive File:

- provide a short "test_BankAccount" demonstrating how to create an object of the "BankAccount" class and call the methods according to specifications.

Now, write JAVA code to implement the "BankAccount" class and driver file according to the above specifications.

Ques no 3:

Fill the blank box with proper methods name which are indicating by test file.



Ques no 4:

What will be the output of line 8, 11, 15, 16, 21 and 22. Note that when we print an object it calls the To_string (given below after the 24th line) method and print the object's attributes/ variables. For example, the output of line 8 is 8, 5, 7

```
1.  public class TestBox {
2.      public static void main (String[] args)
3.      {
4.          Box b1;
5.          Box b2;
6.
7.          b1 = new Box (8, 5, 7); // Here, L = 8, W = 5, H = 7
8.          System.out.println(b1);
9.
10.         b2 = b1;
11.         System.out.println(b2);
12.         System.out.println();
13.
14.         b1 = new Box (3, 9, 2);
15.         System.out.println(b1);
16.         System.out.println(b2);
17.         System.out.println();
18.
19.         b1 = b2;
20.         b1.L = 10;
21.         System.out.println(b1);
22.         System.out.println(b2);
23.         System.out.println();
24.     }
25. }
```

To_string Method:

```
public String toString() {
      return this.L + ", " + this.W + ", " + this.H;
   }
```