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First Semester, 2025-2026
ITCS107,114 (Computer Programming II)
Final Exam Revision

Question 1: Choose the correct answer from the given choices.

(1) What is the output of the following program segment:

- (a) 3.5
- (b) 3
- (c) Compile Error
- (d) Error occurred

```
public static void main(String[] args) {  
    int i=0, j=2;  
    try {  
        i = calculate(j);  
        System.out.println(i);  
    }  
    catch (Exception e) {  
        System.out.println("Error occurred");  
    }  
}  
  
static int calculate (int x)  
{  
    return (7/x);  
}
```

- (2) To create an array of size 10 of type a class named employee, the following statement can be used:
- (a) `employee list = new employee [10];`
 - (b) `employee [] list = new int [10];`
 - (c) `employee [] list = new employee (10);`
 - (d) `employee [] list = new employee [10];`
- (3) If no exception occurs within a try block, the rest of the try block is ignored.
- (a) True
 - (b) False
- (4) The keyword that must be used to monitor exceptions is:
- (a) throw
 - (b) try
 - (c) catch
 - (d) exception
- (5) Which of these keywords is used to manually throw an exception?
- (a) catch
 - (b) throw
 - (c) exception
 - (d) try
- (6) Which of these methods return description of an exception?
- (a) `obtainDescription()`
 - (b) `obtainMessage()`
 - (c) `getMessage()`
 - (d) `getException()`

- (7) what does GUI stand for?
- (a) General User Interface
 - (b) Graphical Unit Interface
 - (c) Graphical User Interface
 - (d) None of these
- (8) Which method can set or change the text in a Label?
- (a) setText()
 - (b) getText()
 - (c) a and b
 - (d) None of these
- (9) Which method is used to set the graphics current color to the specified color in the graphics class?
- (a) setFont(Font font)
 - (b) setColor(Color c)
 - (c) drawString(String str, int x, int y)
 - (d) None of these
- (10) Assume that **Employee** is an interface and **RegularEmployee** is an actual class (concrete class) that implements the interface **Employee**.
- Which of the following is **NOT** a valid statement:
- (a) Employee e1 = new Employee(Ali, 15012);
 - (b) Employee e2 = new RegularEmployee(Ali, 15012, 1050);
 - (c) RegularEmployee e3 = new RegularEmployee(Ali, 15012, 1050);
 - (d) Employee e4;

(11) Assume that **Computer** is an abstract class having an abstract method called **power**, The method **power** can be written correctly within the **Computer** class as follows: (Note that {...} means there is some code inside the curly parenthesis).

- (a) public abstract double power();
- (b) public double abstract power();
- (c) public double power () {...}
- (d) public double abstract power () {...}

(12) You are given an interface called Area and a class called Circle that implements it, the correct heading of the class Circle is:

- (a) public Area implements Circle
- (b) public Area extends Circle
- (c) public class Circle extends Area
- (d) public class Circle implements Area

(13) Assume that class Furniture has following two private data fields:

private String name;
private int code;

and the following method, in addition to other methods:

public String toString() { return name + code ; }

Now, we want to write a class called DiningSet that inherits the properties of class Furniture as follows, having only one data field:

public class DiningSet extends Furniture {
private int sittingCapacity;

we want to include a method toString in class DiningSet to create a String representation of the object, including all attributes, It can be written as follows:

- (a) public String toString () {return this.toString() + sittingCapacity; }
- (b) public String toString () {return Furniture.toString() + sittingCapacity; }
- (c) public String toString () {return super.toString() + sittingCapacity; }
- (d) public String toString () {return name + code + sittingCapacity; }

(14) You are given one abstract super class called Animal, and you have a sub-class (derived class) called Dog that inherits the properties of class Animal. Abstract method called makeSound() is declared in class Animal and class Dog has an implementation of the abstract method makeSound() given in the Animal abstract class, Which of the following is correct implementation of method makeSound()

- (a) public abstract void makeSound() {}
- (b) public void abstract makeSound() {}
- (c) public void makeSound() {}
- (d) all are correct

(15) You are given a super class called People and a sub-class (derived class) called Engineer. The sub-class (derived class) has a method called update(), but the super class does not have update() method. Which of the following is the correct use of update method?

- (a) People a = new Engineer (); ... ; a.update();
- (b) Engineer a = new People (); ... ; a.update();
- (c) Engineer a = new Engineer (); ... ; a.update();
- (d) People a = new People ();....; a.update();

Question 2 : What is the output of the following codes?

(A)

public class Program2 { public static void main(String[] args) { int c = 0; while(true){ try{ switch (c){ case 0: case 1: case 2: c= c+3; throw new Exception("First"); case 3: case 4: throw new Exception("Second"); case 5: throw new Exception("Third"); default: System.out.println("c = "+c+" and Fourth"); } if(c > 5) break; } catch(Exception ex){ System.out.println("c = "+c+" and "+ex.getMessage()); c=c+2; } } } }	Output

(B)

public static void recursion (int n, int m) { if (n<m) { System.out.println(n); recursion(n+1,m-n); System.out.println(m); } }	Output
public static void main(String[] args) { recursion(3,15); }	

(C)

public static int getNum(int n) { System.out.println(n); if (n == 1) { System.out.println("One"); return 0; } else if (n % 2 == 0) return 1 + getNum (n-1); else return 2 + getNum (n-1); }	Output
public static void main(String[] args) { int x = getNum(3); System.out.println(x); }	

(D)

```
public class numClass {  
    private int a;  
    private static int y=10;  
  
    public numClass (int newX)  
    { a = newX; }  
  
    public void set (int newX)  
    { a = newX; }  
  
    public void setY (int newY)  
    {y = newY;}  
  
    public static int getY ()  
    {return y;}  
}
```

```
public class output {  
    public static void main(String[] args) {  
        numClass one = new numClass(10);  
        numClass two = new numClass(2);  
  
        try{  
            one.setY(30);  
            two.set(4);  
            if(one.getY()==30)  
                throw new Exception("30");  
            one.setY(40);  
        }  
        catch (Exception e){  
            two.setY(50);  
        }  
    }  
}
```


Question 3:

Write the definition of a class named **shoppingList** that include the following private members:

- **list:** an array of type String to hold the names of items in the list.
- **numItems:** an integer to represent the number of items in the list.

Additionally, the class should include the following public methods:

1. A default constructor to initialize numItems to zero and create list as an array of size 10.
2. A constructor with an integer parameter (m) to initialize numItems to zero and create list as an array of size (m).
3. A method named addItem that takes a string (y). The method should add (y) to the end of the list array and increment numItems if it is not full.
4. A method named replace that takes two strings (M, N). The method should replace all of occurrences of (M) in the list array by (N).
5. A method named print to print the items in the list array.

Question 4: Write a Java program to read from two different files:

1. A file called “ruffle.txt”, in which each of the 100 records includes participant’s ticketNo, CPR, name, and mobile number. The file uses a comma separated file format, as the sample below.
2. A file called “winner.txt”, which contains a single number representing the ticketNo drawn, as the sample below.

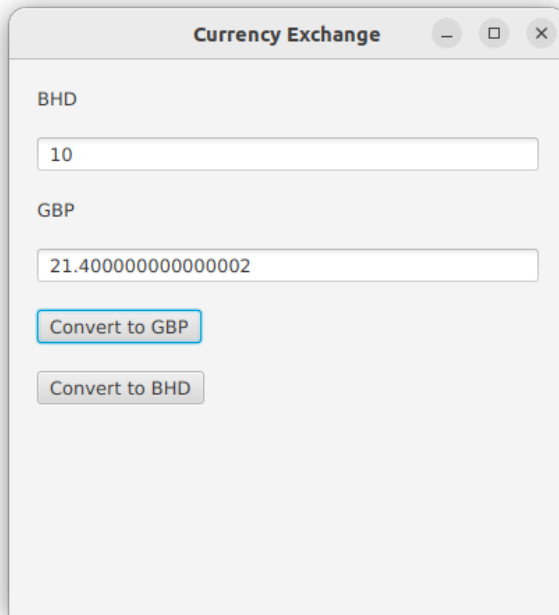
The program should display on screen the winner’s name as well as the count of times the winner did participate in the ruffle, similar to the given sample.

ruffle.txt	winner.txt
5512, 661237239,Ali Hasan, 36123436 3345,890812312,Fatma Mohammed, 34123123 2259,960355533,Yaser Ahmed,33142777 4001,890812312,Fatma Mohammed, 34123123 4002,890812312,Fatma Mohammed, 34123123	4001

Screen output

The winner is: Fatma Mohammed
The count of tickets of the winner is: 3

Question 5: Consider the following GUI application for currency exchange.



Assume you are given the following code for the application.

```
public class HelloApplication extends Application{
    private TextField bhdTxt,gbpTxt;
    private Label bhdlbl, gbpLbl;
    private Button tobhdbtn, togbpbtn;

    @Override
    public void start(Stage stage) {

        VBox box = new VBox(); bhdlbl = new Label("BHD");

        gbpLbl = new Label("GBP"); gbpTxt = new TextField();

        bhdTxt = new TextField(); bhdTxt = new TextField("0");

        gbpTxt = new TextField("0");
        tobhdbtn = new Button("Convert to BHD");
```

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```
        togbpbtn = new Button("Convert to GBP");
        box.getChildren().addAll(bhdlbl,bhdTxt,gbpLbl,gbpTxt,togbpbtn,tobhdbtn);

        tobhdbtn.setOnAction(this::tobhd);
        togbpbtn.setOnAction(this::togbp);
```

```

Scene scene = new Scene(box, 400, 400); stage.setTitle("Currency
Exchange"); stage.setScene(scene);
stage.show();

}
private void tobhd(ActionEvent actionEvent) {
    // add code of Q1

    ... ..

}
private void togbp(ActionEvent actionEvent) {
    // add code of Q2

    ...

    ...

} }

```

Q1: Implement the code for **tobhdbtn** button, The method need to read the data from gbpTxt and convert it to amount in Bharini Dinar and write in bhdTxt using this equation.

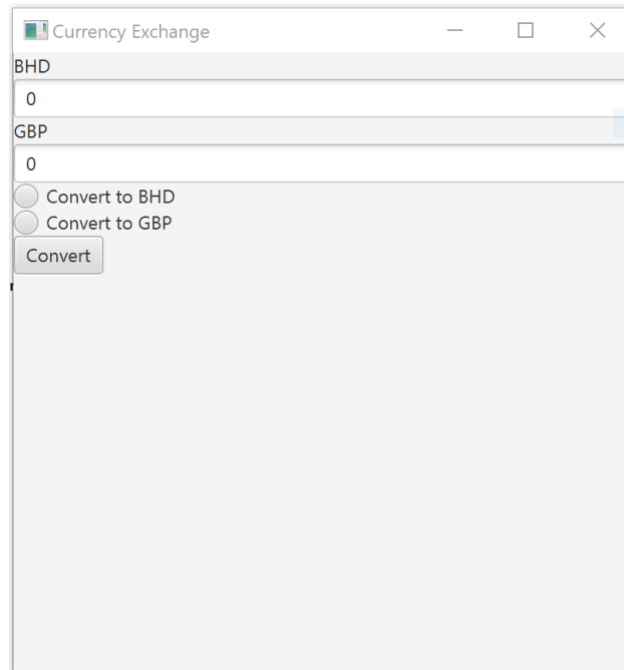
BHD Amount = GBP amount x 0.47;

Q2: Implement the code for **tobhdbtn** button, The method need to read the data from gbpTxt and convert it to amount in Bharini Dinar and write in bhdTxt using this equation.

GBP Amount = BHD amount x 2.14;

Question 6:

Consider the following GUI application for currency exchange.



Assume you are given the following code for the application.

```
public class GUI2 extends Application{

    private TextField bhdTxt, gbpTxt;
    private Label bhdlbl, gbplbl;
    private Button convert;
    private RadioButton tobhd, togbp;

    @Override
    public void start(Stage stage) {

        bhdlbl = new Label("BHD");
        gbplbl = new Label("GBP");

        gbpTxt = new TextField();
        bhdTxt = new TextField();

        bhdTxt = new TextField("0");
        gbpTxt = new TextField("0");

        tobhd = new RadioButton("Convert to BHD");
        togbp = new RadioButton("Convert to GBP");

        ToggleGroup group = new ToggleGroup();
```

```

        tobhd.setToggleGroup(group);
        togbp.setToggleGroup(group);

        convert = new Button("Convert");

        VBox box = new
Box (bhdLbl, bhdTxt, gbplbl, gbpTxt, tobhd, togbp, convert);

        convert.setOnAction(this::convert);

        Scene scene = new Scene(box, 400, 400);
        stage.setTitle("Currency Exchange");
        stage.setScene(scene);
        stage.show();

    }
    private void convert(ActionEvent actionEvent) {
        // Add Code here for Q1
        ...
        ...
    }
}

} // end of class

```

Q1: Implement the code for **Convert** button, as follow:

- If the RadioButton “Convert to BHD” is selected, then:
 - The method need to read the data from gbpTxt and convert it to amount in Bharini Dinar and write in bhdTxt using this equation:

$$\text{BHD Amount} = \text{GBP amount} \times 0.47;$$
- If the RadioButton “Convert to GBP” is selected, then:
 - The method need to read the data from gbpTxt and convert it to amount in Bharini Dinar and write in bhdTxt using this equation:
$$\text{GBP Amount} = \text{BHD amount} \times 2.14;$$

Question 7:

1- Write a recursion method named **sum** to find the summation of the following:

$$f(1) = 1$$

$$f(n) = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \dots + \frac{1}{n}$$

for Example if n =5

$$\sum_{x=1}^n \frac{1}{x} = 2.2833$$

2- Write a java program to ask the user to enter the positive integer (n) and print the summation on the screen

Input/ output Sample:

Enter a positive integer n: 5

The summation is = 2.2833333333333333

Question 8:

1- Write a recursive method named **output** that take as parameter integer n, the method should print '+' n times followed by '#' n times.

Do not use any loops, use only one variable n.

for Example

1- if n =2

output : + + ##

2- if n =4

output : + + + + ####

2- Write a java program to ask the user to enter the positive integer (n) and call the method output to show output on the screen