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Course: OOP in Java

Instructor: HOK Tin

Assignment: LAB-1

Due Date: March 30, 2025 (11:59 AM)

❖ Lab01.1. Hello One's Name

Implement an application Java that displays "Hello <your_name>!" where <your_name> represents your own name. Example, in case your name is: Visal, then:

Console Output:

```
Hello Visal!
```

Source code:

```java

public class Ex1 {

    public static void main(String[] args) throws Exception {
        System.out.println("Hello, Rith");
    }
}

```

Output:

```
Hello, Rith
```

Lab01.2. Display a Paragraph

Implement an application Java that displays the following output:

Console Output:

```
\n                                  Line break.
\t                                  Tabulation.
\'                                  Single Quote.
\"                                  Double Quote.
\\                                  \ Sign.
\\\\                                \\ Sign.
//                                  Line Comment.
/* ... */                          Block Comment.
"""

                                    Text block.
"""
```

Source code:

```java

public class Ex2 {

    public static void main(String[] args) {
        System.out.println("\\n\t\t\t\t\t\t\t\tLine break.");
        System.out.println("\\t\t\t\t\t\t\t\tTabulation.");
        System.out.println("\\'\t\t\t\t\t\t\t\tSingle Quote.");
        System.out.println("\\\"\t\t\t\t\t\t\t\tDouble Quote.");
        System.out.println("\\\\\t\t\t\t\t\t\t\\Sign.");
        System.out.println("\\\\\\\\\t\t\t\t\t\t\t\\\\Sign.");
        System.out.println("//\t\t\t\t\t\t\t\tLine Comment.");
        System.out.println("/*...*/\t\t\t\t\t\t\tBlock Comment.");
        System.out.println("\"\"\"");
        System.out.println("\t\t\t\t\t\t\t\tText block.");
        System.out.println("\"\"\"");
    }
}

```

Output:

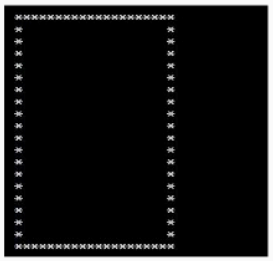
```
\n                                  Line break.
\t                                  Tabulation.
\'                                  Single Quote.
\"                                  Double Quote.
\\                                  \Sign.
\\\\                                \\Sign.
//                                  Line Comment.
/*...*/                            Block Comment.
"""

                                    Text block.
"""
```

❖ Lab01.3. Asterisks

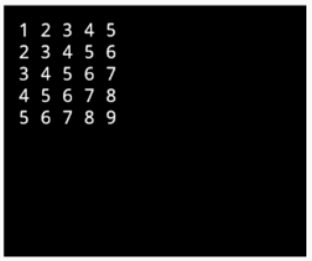
Write a program in Java to display shapes as below:

Console Output:

A



B



C

Source Code:

```java
class Shape {

    void star() {
        int rows = 10;

        for (int i = rows; i >= 1; i--) {

            for (int j = rows; j > i; j--) {
                System.out.print(" ");
            }

            for (int k = 1; k <= (2 * i - 1); k++) {
                System.out.print("*");
            }
            System.out.println();
        }
    }

    void rectangle() {
        int height = 15;
        int width = 13;

        for (int i = 1; i <= height; i++) {
            for (int j = 1; j <= width; j++) {
                if (i == 1 || i == height || j == 1 || j == width) {
                    System.out.print("*");
                } else {
                    System.out.print(" ");
                }
            }
            System.out.println();
        }
    }

    void matrix() {

        int rows = 5;
        int cols = 5;

        for (int i = 1; i <= rows; i++) {
            for (int j = i; j < i + cols; j++) {
                System.out.print(j + " ");
            }
            System.out.println();
        }
    }

}
```

```java
public class test {

    public static void main(String[] args) {

        Shape Shapes = new Shape();

        System.out.printf("%10s\n\n", "A");
        Shapes.star();
        System.out.println();
        System.out.printf("%7s\n\n", "B");
        Shapes.rectangle();
        System.out.println();
        System.out.printf("%5s\n\n", "C");
        Shapes.matrix();

    }
}
```

Output:

```
         A

********************
 ******************
  ****************
   **************
    ************
     **********
      *********
       *******
        *****
         ***
          *

      B

*************
*           *
*           *
*           *
*           *
*           *
*           *
*           *
*           *
*           *
*           *
*           *
*           *
*           *
*           *
*************

    C

1 2 3 4 5
2 3 4 5 6
3 4 5 6 7
4 5 6 7 8
5 6 7 8 9
```

❖ Lab01.4. Table

Write a program in Java to display tables as below ***with values declared by variables***:

```
     |  1|  2|  3|  4|  5|  6|  7|  8|  9| 10|
-------------------------------------------------
   1|  1|  2|  3|  4|  5|  6|  7|  8|  9| 10|
   2|  2|  4|  6|  8| 10| 12| 14| 16| 18| 20|
   3|  3|  6|  9| 12| 15| 18| 21| 24| 27| 30|
   4|  4|  8| 12| 16| 20| 24| 28| 32| 36| 40|
   5|  5| 10| 15| 20| 25| 30| 35| 40| 45| 50|
```

A

```
+---------------+---------+--------------------+-----+
| Country       | Name    | Profession         | Age |
+---------------+---------+--------------------+-----+
| Germany       | Michael | Computer Engineer  | 19  |
+---------------+---------+--------------------+-----+
| England       | Robert  | Artist             | 34  |
+---------------+---------+--------------------+-----+
| United Kingdom | Julia  | Designer           | 42  |
+---------------+---------+--------------------+-----+
| United Staates | Jo     | Actor              | 21  |
+---------------+---------+--------------------+-----+
```

B

Source Code:

```java

public class Ex4 {

    public static void main(String[] args) {

        int[] numbers = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};

        System.out.printf("5s\n", "A");
        System.out.println("-------------------------------------------------------------------");

        System.out.print("|    |");
        for (int num : numbers) {
            System.out.printf(" M|", num);
        }
        System.out.println();
        System.out.println("-------------------------------------------------------------------");

        for (int i = 1; i <= 5; i++) {
            System.out.printf("| - |", i);
            for (int j = 0; j < numbers.length; j++) {
                int value = i * numbers[j];
                System.out.printf(" M|", value);
            }
            System.out.println();
        }
        System.out.println("-------------------------------------------------------------------");

        System.out.printf("0s\n", "B");
        System.out.println("-----------------------------------------------------------");
        System.out.printf("| %-15s | %-10s | %-17s | %-4s|\n", "Country", "Name", "Profession", "Age");
        System.out.println("-----------------------------------------------------------");

        String[][] people = {
            {"Germany", "Michael", "Computer Engineer", "19"},
            {"England", "Robert", "Artist", "34"},
            {"United Kingdom", "Julia", "Designer", "42"},
            {"United State", "Jo", "Actor", "21"}
        };

        for (String[] person : people) {
            System.out.printf("| %-15s | %-10s | %-17s | %-4s|\n", person[0], person[1], person[2], person[3]);
            System.out.println("-----------------------------------------------------------");
        }
    }
}

```

Output:

```
-------------------------------------------------------------
|    |    1|    2|    3|    4|    5|    6|    7|    8|    9|   10|
-------------------------------------------------------------
|  1 |    1|    2|    3|    4|    5|    6|    7|    8|    9|   10|
|  2 |    2|    4|    6|    8|   10|   12|   14|   16|   18|   20|
|  3 |    3|    6|    9|   12|   15|   18|   21|   24|   27|   30|
|  4 |    4|    8|   12|   16|   20|   24|   28|   32|   36|   40|
|  5 |    5|   10|   15|   20|   25|   30|   35|   40|   45|   50|
-------------------------------------------------------------

                            B
-----------------------------------------------------------
| Country         | Name       | Profession       | Age |
-----------------------------------------------------------
| Germany         | Michael    | Computer Engineer | 19  |
-----------------------------------------------------------
| England         | Robert     | Artist           | 34  |
-----------------------------------------------------------
| United Kingdom  | Julia      | Designer         | 42  |
-----------------------------------------------------------
| United State    | Jo         | Actor            | 21  |
-----------------------------------------------------------
```

Exercise 5:

Source Code:

```java

class operations {

    void Length(String text) {
        System.out.println("Text length is: " + text.length());
    }

    void Cut(String text, String cut) {
        System.out.println("Result: " + text.replaceFirst(cut, "").trim());
    }

    void vowel(String text) {
        String vowels = "aeiouAEIOU";
        for (int i = 0; i < text.length(); i++) {
            char ch = text.charAt(i);
            if (vowels.indexOf(text.charAt(i)) != -1) {
                System.out.println("\"" + ch + "\" is at index: " + i);
            }
        }
    }

    void check2TextEqual() {

        String str1 = "Hi Student!";
        String str2 = "Students";
        String str3 = "Hi Student!";

        System.out.println("\nText1 is equal to Text2: " + str1.equals(str2));
        System.out.println("Text1 is equal to Text3: " + str1.equals(str3));
    }

    void CheckTextContains() {
        String txt1 = "Hi Students!";
        String txt2 = "Students";
        String txt3 = "Teacher";

        System.out.println("\nText1 contains Text2: " + txt1.contains(txt2));
        System.out.println("Text1 contains Text3: " + txt1.contains(txt3));
    }
}

public class Ex5 {

    public static void main(String[] args) {

        operations op = new operations();

        String textA = "I Love My Hometown";
        String textB = "I love my little country";
        String textC = "Hi Students!";
        op.Length(textA);
        System.out.println();
        op.Cut(textB, "I love");
        System.out.println();
        op.vowel(textC);
        System.out.println();
        op.check2TextEqual();
        System.out.println();
        op.CheckTextContains();
    }
}

```

Output:

```
Text length is: 18

Result: my little country

"i" is at index: 1
"u" is at index: 5
"e" is at index: 7


Text1 is equal to Text2: false
Text1 is equal to Text3: true


Text1 contains Text2: true
Text1 contains Text3: false
```

Exercise6:

Source Code:

```java

class Car {

    String model;
    String engine_type;
    String color;
    int year;
    double price;

    Car(String model, String engine_type, String color, int year, double price) {
        this.model = model;
        this.engine_type = engine_type;
        this.color = color;
        this.year = year;
        this.price = price;
    }

    void display() {
        System.out.println("_____________________");
        System.out.println("Car Model: " + model);
        System.out.println("Car Engine Type: " + engine_type);
        System.out.println("Color of the Car: " + color);
        System.out.println("Year of the Car: " + year);
        System.out.printf("Price of the Car ($) %.2f\n", price);
        System.out.println("-------------------------------------");
    }
}

class Employee {

    String name;
    String id;
    int age;
    char gender;
    double salary;
```

```java
class Employee {

    String name;
    String id;
    int age;
    char gender;
    double salary;

    Employee(String name, String id, int age, char gender, double salary) {
        this.name = name;
        this.id = id;
        this.age = age;
        this.gender = gender;
        this.salary = salary;
    }

    void display() {
        System.out.println("_____________________");
        System.out.println("Employee ID: " + id);
        System.out.println("Employee Name: " + name);
        System.out.println("Employee Age: " + age);
        System.out.println("Employee Gender: " + gender);
        System.out.printf("Employee Salary is (USD) %.2f\n", salary);
        System.out.println("---------------------------------");
    }
}

class BankAccount {

    private String password;
    String username;
    String id;
    private double balance;
    String email;

    BankAccount(String username, String id, String email) {
        this.username = username;
        this.id = id;
        this.email = email;
    }

    String getPassword() {
        return password;
    }

    void setPassword(String password) {
        this.password = password;
    }

    double getBalance() {
        return balance;
    }

    void setBalance(double balance) {
        this.balance = balance;
    }

    void display() {
        System.out.println("_____________________");
        System.out.println("User Password: " + getPassword());
        System.out.println("Username: " + username);
        System.out.println("User ID: " + id);
        System.out.println("User Email: " + email);
        System.out.printf("User Balance is (USD) %.2f\n", getBalance());
        System.out.println("---------------------------------");
    }
}

class Video {

    String title;
    double fileSize;
    int resolution;
    int numberOfView;
    int numberOfLike;
```

```java
class Video {

    String title;
    double fileSize;
    int resolution;
    int numberOfView;
    int numberOfLike;

    Video(String title, double fileSize, int resolution, int numberOfView, int numberOfLike) {
        this.title = title;
        this.fileSize = fileSize;
        this.resolution = resolution;
        this.numberOfView = numberOfView;
        this.numberOfLike = numberOfLike;
    }

    void display() {
        System.out.println("                    ");
        System.out.println("Title: " + title);
        System.out.printf("File Size: %.2f MB\n", fileSize);
        System.out.println("Resolution: " + resolution + "p");
        System.out.println("Views: " + numberOfView);
        System.out.println("Likes: " + numberOfLike);
        System.out.println("---------------------------------");
    }
}

public class Ex6 {

    public static void main(String[] args) {

        Car car1 = new Car("Pirus", "V4", "White", 2005, 12000);
        Car car2 = new Car("Honda CV", "Hybrid V4", "Black", 2006, 40000);

        Employee employee1 = new Employee("Virak Rith", "p20230033", 21, 'M', 2000);
        Employee employee2 = new Employee("Do Davin", "p20230018", 20, 'M', 2000);

        BankAccount user1 = new BankAccount("Virak Rith", "123456789", "rith@gmail.com");
        BankAccount user2 = new BankAccount("Do Davin", "1234567890", "dodavin@gmail.com");

        Video video1 = new Video("Mukbang", 1090.3, 1080, 17423, 4210);
        Video video2 = new Video("Animal Show", 705.3, 1080, 23626, 1342);

        System.out.println("=== Car Information ===");
        car1.display();
        car2.display();

        System.out.println("\n=== Employee Information ===");
        employee1.display();
        employee2.display();

        System.out.println("\n=== Bank Account Information ===");
        user1.setPassword("11111111!D");
        user1.setBalance(1000);
        user1.display();
        user2.setPassword("22222222!D");
        user2.setBalance(1000);
        user2.display();

        System.out.println("\n=== Video Information ===");
        video1.display();
        video2.display();
    }
}
```

Output:

```
=== Car Information ===

--------------------
Car Model: Pirus
Car Engine Type: V4
Color of the Car: White
Year of the Car: 2005
Price of the Car ($) 12000.00
-----------------------------------

--------------------
Car Model: Honda CV
Car Engine Type: Hybrid V4
Color of the Car: Black
Year of the Car: 2006
Price of the Car ($) 40000.00
-----------------------------------
```

```
=== Employee Information ===

--------------------
Employee ID: p20230033
Employee Name: Virak Rith
Employee Age: 21
Employee Gender: M
Employee Salary is (USD) 2000.00
-----------------------------------

--------------------
Employee ID: p20230018
Employee Name: Do Davin
Employee Age: 20
Employee Gender: M
Employee Salary is (USD) 2000.00
-----------------------------------
```

```
=== Bank Account Information ===

--------------------
User Password: 11111111!D
Username: Virak Rith
User ID: 123456789
User Email: rith@gmail.com
User Balance is (USD) 1000.00
-----------------------------------

--------------------
User Password: 22222222!D
Username: Do Davin
User ID: 1234567890
User Email: dodavin@gmail.com
User Balance is (USD) 1000.00
-----------------------------------
```

```
=== Video Information ===

--------------------
Title: Mukbang
File Size: 1090.30 MB
Resolution: 1080p
Views: 17423
Likes: 4210
-----------------------------------

--------------------
Title: Animal Show
File Size: 705.30 MB
Resolution: 1080p
Views: 23626
Likes: 1342
-----------------------------------
```

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