Rajalakshmi Engineering College

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Gloria is responsible for monitoring the performance of two machines in a factory. She needs to determine which of the two machines is operating closest to the optimal temperature of 100 degrees Celsius using the relational operator.

Assist Gloria in displaying the machine's temperature, which is closer to 100, and the difference from 100.

Input Format

The first line of input consists of an integer N, representing the temperature of the first machine.

The second line consists of an integer M, representing the temperature of the second machine.

Output Format

The output prints "The integer closer to 100 is X with a difference of Y" where X is the temperature of the closer machine and Y is the difference from 100.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 90
80

Output: The integer closer to 100 is 90 with a difference of 10

Answer

```
// You are using Java
import java.util.Scanner;
class main{
   public static void main(String args[]){
      Scanner r=new Scanner(System.in);
      int n=r.nextInt();
      int m=r.nextInt();
      int diffn=(n>100)?(n-100):(100-n);
      int diffm=(m>100)?(m-100):(100-m);
      if(diffn<diffm){
         System.out.println("The integer closer to 100 is"+n+"with a difference
of"+diffn);
      }
      else if(diffm<diffn){
         System.out.println("The integer closer to 100 is"+m+"with a difference
of"+diffm);
      }
      else{
         System.out.println("The integer is not close to 100");
      }
   }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 7.5

Section 1 : Coding

1. PROBLEM STATEMENT:

Dave got two students who wants help with their doubt. Each handouts an integer and wants to find if one Integer Positive While the Other is Not Divisible by 3. Write a program to achieve this and conclude for them.

Input Format

The first line of input represents the first integer.

The second line of input represents the second integer.

Output Format

The output should display as "One of the integers is positive while the other is not divisible by 3." or "Neither of the integers meets the condition."

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 4
3
Output: One of the integers is positive while the other is not divisible by 3.

Answer

```
// You are using Java
import java.util.Scanner;
class main{
   public static void main(String args[]){
      Scanner r=new Scanner(System.in);
      int a=r.nextInt();
      int b=r.nextInt();
      if(a%3==0 && b%3==0){
         System.out.println("Neither of the integers meets the condition.");
      }
      else{
         System.out.println("One of the integers is positive while the other is not
divisible by 3.");
      }
   }
}
```

Status : Partially correct ***Marks : 7.5/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem statement

Manoj, a developer at MoneyMatters Inc., is working on improving the company's financial system. He needs to create a program that takes an integer input, converts it into a double, and displays both the original integer and the converted double value.

Input Format

The input consists of a single integer representing a monetary amount.

Output Format

The first line of the output displays the "Original Integer: ", followed by an integer representation of the input value.

The second line displays the "Converted Double: ", followed by a double value representing the input as a decimal value.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 20

Output: Original Integer: 20
Converted Double: 20.0

Answer

```
// You are using Java
import java.util.Scanner;
class main{
    public static void main(String args[]){
        Scanner r=new Scanner(System.in);
        int n=r.nextInt();
        double m=(double)n;
        System.out.println("Original Integer: "+n);
        System.out.println("Converted Double: "+m);
    }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem statement

Manoj, a developer at MoneyMatters Inc., is working on improving the company's financial system. He needs to create a program that takes an integer input, converts it into a double, and displays both the original integer and the converted double value.

Input Format

The input consists of a single integer representing a monetary amount.

Output Format

The first line of the output displays the "Original Integer: ", followed by an integer representation of the input value.

The second line displays the "Converted Double: ", followed by a double value representing the input as a decimal value.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 20

Output: Original Integer: 20
Converted Double: 20.0

Answer

```
// You are using Java
import java.util.Scanner;
class main{
    public static void main(String args[]){
        Scanner r=new Scanner(System.in);
        int n=r.nextInt();
        double m=(double)n;
        System.out.println("Original Integer: "+n);
        System.out.println("Converted Double: "+m);
    }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem statement

Manoj, a developer at MoneyMatters Inc., is working on improving the company's financial system. He needs to create a program that takes an integer input, converts it into a double, and displays both the original integer and the converted double value.

Input Format

The input consists of a single integer representing a monetary amount.

Output Format

The first line of the output displays the "Original Integer: ", followed by an integer representation of the input value.

The second line displays the "Converted Double: ", followed by a double value representing the input as a decimal value.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 20

Output: Original Integer: 20
Converted Double: 20.0

Answer

```
// You are using Java
import java.util.Scanner;
class main{
    public static void main(String args[]){
        Scanner r=new Scanner(System.in);
        int n=r.nextInt();
        double m=(double)n;
        System.out.println("Original Integer: "+n);
        System.out.println("Converted Double: "+m);
    }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q6

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Joey is learning about bitwise operations and is working on a project that involves extracting specific bits from integers. He needs to write a program that takes an integer and the number of bits N as input and outputs the value of the lowest N bits of the integer.

Help Joey in his project to understand and visualize how bitwise operations work in practical scenarios.

Input Format

The first line of input consists of an integer X, representing the given integer.

The second line consists of an integer N, representing the number of bits to extract.

Output Format

The output displays "Result: " followed by an integer representing the value of the lowest N bits of the given integer.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 85
2
Output: Result: 1

Answer

```
// You are using Java
import java.util.Scanner;
class main{
   public static void main(String args[]){
      Scanner r=new Scanner(System.in);
      int x=r.nextInt();
      int n=r.nextInt();
      int m=(1<<n)-1;
      int e=x&m;
      System.out.println("Result: "+e);
   }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q7

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement:

Miles is working on a program that involves analyzing two integers. He wants to check if either one of the integers is both:

Less than or equal to zero, andOdd.Can you help him create a program that identifies whether either of the integers meets these conditions?

Input Format

The input consists of two integers on separate lines, denoted as 'input1' and 'input2'.

Output Format

A single line with a boolean result (either 'true' or 'false') indicating whether either 'input1' or 'input2' is both less than or equal to zero and odd.

Refer to the sample output for format specifications

Sample Test Case

Input: -45
10
Output: true

Answer

```
// You are using Java
import java.util.Scanner;
class main{
    public static void main(String args[]){
        Scanner r= new Scanner(System.in);
        int a=r.nextInt();
        int b=r.nextInt();
        if((a<=0 & a%2!=0)||(b<=0 & b%2!=0)){
            System.out.println("true");
        }
        else{
            System.out.println("false");
        }
    }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q8

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

In the Kingdom of Finance, the royal treasury is managed by the treasurer, Sir Cedric. Sir Cedric tracks the daily expenses of the kingdom using an expense report that lists three major categories: food, clothing, and utilities. However, the King wants to know if the average daily expense is greater than at least two of these categories to ensure the kingdom is spending wisely.

Your task is to help Sir Cedric determine if the average daily expense is greater than two of the categories. Specifically, you need to calculate the average of the three expenses and check if it is greater than any two categories.

Note: Use the ternary operator

Input Format

Three integers a, b, and c represent the daily expenses for food, clothing, and utilities. Each integer is provided on a single line.

Output Format

The average of the three expenses, rounded to two decimal places.

A message indicating whether the average is greater than at least two of the expense categories.

1. If the average is greater than the two smallest monthly expenses, print "Average is greater than both X and Y," where X and Y are the two smallest expenses.
2. Otherwise, display "Average is not greater than two smallest expenses".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 4
6
10

Output: 6.67
Average is greater than both 4 and 6

Answer

```
// You are using Java
import java.util.Scanner;
class main{
   public static void main(String args[]){
      Scanner r=new Scanner(System.in);
      int a=r.nextInt();
      int b=r.nextInt();
      int c=r.nextInt();
      double avg=(double)(a+b+c)/3;
      System.out.printf("%.2f\n",avg);
      if(avg>a && avg>b){
         System.out.println("Average is greater than both "+a+"and"+b);
      }
```

```
        else if(avg>b && avg>c){
            System.out.println("Average is greater than both "+b+"and"+c);
        }
        else if(avg>c && avg>a){
            System.out.println("Average is greater than both "+a+"and"+c);
        }
        else{
            System.out.println("Average is not greater than two smallest expenses");
        }
    }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q9

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Phill is a quality control manager at a manufacturing plant. He needs to verify if a sensor reading at a midpoint station (S2) falls exactly halfway between the readings of the previous station (S1) and the next station (S3). Help him by developing a program that checks if the second sensor reading is the average (midpoint) of the first and third sensor readings.

Use the relational operator to solve the program.

Input Format

The first line of input consists of an integer S1, representing the sensor reading of the first station.

The second line consists of an integer S2, representing the sensor reading of the midpoint station.

The third line consists of an integer S3, representing the sensor reading of the next station.

Output Format

The first line of output displays a boolean value representing whether the sensor reading at the midpoint station is halfway between the readings of the first and the next stations.

The second line displays one of the following:

1. If the result is true, print "The second integer is halfway between the first and third integers."
2. Otherwise, print "The second integer is not halfway between the first and third integers."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1
7
10

Output: false
The second integer is not halfway between the first and third integers.

Answer

```
// You are using Java
import java.util.Scanner;
class main{
   public static void main(String args[]){
      Scanner r=new Scanner(System.in);
      int s1=r.nextInt();
      int s2=r.nextInt();
      int s3=r.nextInt();
      boolean mid=(s2==(s1+s3)/2);
      System.out.println(mid);
      if(mid==true){
         System.out.println("The second integer is halfway between the first and
third integers.");
```

```
        }
        else{
            System.out.println("The second integer is not halfway between the first
and third integers.");
        }
    }
}
```

Status : Correct **Marks : 10/10**

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_Q10

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Aishu is supervising a construction project that needs to be completed with the help of three workers: A, B, and C.

She knows how many days each of them would take to complete the entire project individually:

A can complete it in x days,B in y days,C in z days.

Initially, all three workers (A, B, and C) work together for d1 days.

After that, C leaves, and only A and B continue for another d2 days.

Then B also leaves, and A works alone to finish the remaining work.

Your tasks is to help aishu to implement this functionality using the class WorkDistribution and Method calculateWork(int x, int y, int z, int d1, int d2)

Calculate the total work completed in the first d1 days by A, B, and C.Calculate the work completed in the next d2 days by A and B.Determine the remaining work after these d1 + d2 days.

Input Format

The first line of input contains five space-separated integers: x y z d1 d2

where:

x represents the Days A takes to complete the work alone

y represents the Days B takes to complete the work alone

z represents the Days C takes to complete the work alone

d1 represents the Days A, B, and C work together

d2 represents the Days A and B work together (after C leaves)

Output Format

The first line of output prints "Work done in first d1 days (A+B+C): " followed by a double value rounded to 2 decimal places.

The second line of output prints "Work done in next d2 days (A+B): " followed by a double value rounded to 2 decimal places.

The third line prints "Remaining work: " followed by a double value rounded to 2 decimal places.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 10 20 30 2 2

Output: Work done in first d1 days (A+B+C): 0.37
Work done in next d2 days (A+B): 0.30
Remaining work: 0.33

Answer

```
// You are using Java
import java.util.Scanner;
class main{
    public static void main(String args[]){
        Scanner r=new Scanner(System.in);
        int x=r.nextInt();
        int y=r.nextInt();
        int z=r.nextInt();
        int d1=r.nextInt();
        int d2=r.nextInt();
        double wa=1.0/x;
        double wb=1.0/y;
        double wc=1.0/z;
        double w1=d1*(wa+wb+wc);
        double w2=d2*(wa+wb);
        double remaining=1-(w1+w2);
        if(remaining <0) remaining =0;
        System.out.printf("Work done in first d1 days (A+B+C): %.2f\n",w1);
        System.out.printf("work done in next d2 days (A+B): %.2f\n",w2);
        System.out.printf("Remaining work: %.2f",remaining);
    }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 1_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. What is the output of the following code?

```
class TestClass {
    public static void main(String[] args) {
        int a = 5;
        int b = 10;

        int sum = a + b;
        int bitwiseAnd = a & b;
        int bitwiseOr = a | b;

        System.out.println(sum);
        System.out.println(bitwiseAnd);
        System.out.println(bitwiseOr);
    }
}
```

Answer

15015

Status : Correct ***Marks : 1/1***

2. What is the output of the following code?

```
class TestClass {
   public static void main(String[] args) {
      int count = 8;
      count = count ^ 1;

      System.out.println(count);
   }
}
```

Answer

9

Status : Correct ***Marks : 1/1***

3. What is the output of the following code?

```
class TestClass {
   public static void main(String[] args) {
      int x = 5;
      int X = 10;

      int sum = x + X;
      int bitwiseResult = x | X;

      System.out.println(sum);
      System.out.println(bitwiseResult);
   }
}
```

Answer

1515

Status : Correct ***Marks : 1/1***

4. Which of the following data types is used to store floating-point numbers with greater precision?

Answer

double

Status : Correct ***Marks : 1/1***

5. What will be the output of the following code snippet?

```
class DivisionExample {
    public static void main(String[] args) {
        double num1 = 10.5;
        double num2 = 3;
        int result = (int)(num1 / num2);
        System.out.println(result);
    }
}
```

Answer

3

Status : Correct ***Marks : 1/1***

6. What will be the output of the following code?

```
import java.util.*;

class TernaryOperatorExample {
    public static void main(String[] args) {
        int a = 5, b = 10;
        int result = (a > b) ? a : b;
        System.out.println(result);
    }
}
```

Answer

10

Status : Correct ***Marks : 1/1***

7. What is the result of the following expression?

```
import java.util.*;

class ComplexExpressionExample {
    public static void main(String[] args) {
        int a = 5, b = 2, c = 3, d = 4;
        int result = a + b * c / d - b;

        System.out.println(result);
    }
}
```

Answer

4

Status : Correct ***Marks : 1/1***

8. What is the output of the following program?

```
class Demo {
    public static void main(String[] args) {
        String text = "Hello, World!";
        System.out.println(text);
    }
}
```

Answer

Hello, World!

Status : Correct ***Marks : 1/1***

9. What is the output of the following program?

```
class Arithmetic {
    public static void main(String[] args) {
        char ch = 'A';
        System.out.println(ch);
    }
}
```

Answer

A

Status : Correct ***Marks : 1/1***

10. What is the output of the following code?

```
class TestClass {
    public static void main(String[] args) {
        int a = 10;
        int b = 3;
        System.out.println(a / b);
    }
}
```

Answer

3

Status : Correct ***Marks : 1/1***

11. What is the output of the following code?

```
import java.util.*;

class RelationalOperatorExample {
    public static void main(String[] args) {
        int x = 8, y = 4;
        boolean result = (x != y);

        System.out.println(result);
    }
```

```
}
```

Answer

true

Status : Correct ***Marks : 1/1***

12. What will be the output of the following program?

```
class DataTypesMCQ {
   public static void main(String[] args) {
      int a = 10;
      double b = 5;
      System.out.println(a / b);
   }
}
```

Answer

2.0

Status : Correct ***Marks : 1/1***

13. Which of the following is not a primitive data type?

Answer

string

Status : Correct ***Marks : 1/1***

14. What will be the output of the following code snippet?

```
import java.util.*;

class OperatorPrecedenceExample {
   public static void main(String[] args) {
      int a = 5, b = 3, c = 2;
      int result = a + b * c;
```

```
        System.out.println(result);
    }
}
```

Answer

11

Status : Correct ***Marks : 1/1***

15. Which of the following data types is used to store single characters?

Answer

char

Status : Correct ***Marks : 1/1***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Samantha is a diligent math student who is exploring the world of programming. She is learning Java and has recently studied conditional statements. One day, her teacher gives her an interesting problem to solve, which takes a number as input and checks whether it is a multiple of 5 or 7.

Help her complete the task.

Input Format

The input consists of a single integer N, representing the number to be checked.

Output Format

If the number is a multiple of 5 but not 7, the output prints "N is a multiple of 5".

If the number is a multiple of 7, the output prints "N is a multiple of 7".

Otherwise the output prints "N is neither multiple of 5 nor 7" where N is an entered integer.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 10
Output: 10 is a multiple of 5

Answer

```
// You are using Java
import java.util.Scanner;
class main{
   public static void main(String args[]){
      Scanner r=new Scanner(System.in);
      int n=r.nextInt();
      if(n%5==0 && n%7!=0){
         System.out.println(n+ "is a multiple of 5");
      }
      else if(n%7==0){
         System.out.println(n+ "is a multiple of 7");

      }
      else{
         System.out.println(n+ " is neither multiple of 5 nor 7");
      }
   }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. What will be the output of the following code?

```
class ConditionTest {
   public static void main(String[] args) {
      int a = 7;
      if (a == 7)
         System.out.print("Match");
      else
         System.out.print("No Match");
   }
}
```

Answer

Match

Status : Correct ***Marks : 1/1***

2. What will be the output of the following Java code snippet?

```
public class Main {
    public static void main(String[] args) {
        int score = 75;
        if(score >= 90) {
            System.out.println("Grade: A");
        } else if(score >= 80) {
            System.out.println("Grade: B");
        } else if(score >= 70) {
            System.out.println("Grade: C");
        } else {
            System.out.println("Grade: D");
        }
    }
}
```

Answer

Grade: C

Status : Correct ***Marks : 1/1***

3. What will be the output of the following code?

```
class LoopTest {
    public static void main(String[] args) {
        int i = 1;
        while (i > 0) {
            System.out.print(i + " ");
            i++;
            if (i == 5) break;
        }
    }
}
```

Answer

1 2 3 4

Status : Correct ***Marks : 1/1***

4. What will be the output of the following code?

```
class Test {
   public static void main(String[] args) {
      int a = 4, b = 5;
      if ((a + b) % 2 == 0)
         System.out.print("Even");
      else
         System.out.print("Odd");
   }
}
```

Answer

Odd

Status : Correct ***Marks : 1/1***

5. What will be the output of the following code?

```
public class Main {
   public static void main(String[] args) {
      int sum = 0;
      for(int i = 1; i <= 5; i++) {
         sum += i;
      }
      System.out.println(sum);
   }
}
```

Answer

15

Status : Correct ***Marks : 1/1***

6. What will be the output of the following code?

```
class Loop {
   public static void main(String[] args) {
      for (int i = 1; i <= 3; i++) {
```

```
            for (int j = 1; j <= 2; j++) {
                System.out.print(i + "" + j + " ");
            }
        }
    }
}
```

Answer

11 12 21 22 31 32

Status : Correct ***Marks : 1/1***

7. What will be the output of the following code?

```
class Main {
    public static void main(String[] args) {
        for (int i = 5; i > 0; i--) {
            System.out.print(i + " ");
        }
    }
}
```

Answer

5 4 3 2 1

Status : Correct ***Marks : 1/1***

8. What will be the output of the following code?

```
public class Main {
    public static void main(String[] args) {
        for(int i = 1; i <= 20; i = i * 2) {
            System.out.print(i + " ");
        }
    }
}
```

Answer

1 2 4 8 16

Status : Correct **Marks : 1/1**

9. What will be the output of the following Java code snippet?

```
public class Main {
   public static void main(String[] args) {
      int day = 4;
      String result = "";
      switch(day) {
         case 1:
            result = "Monday";
            break;
         case 2:
            result = "Tuesday";
            break;
         case 3:
            result = "Wednesday";
            break;
         default:
            result = "Other Day";
      }
      System.out.println(result);
   }
}
```

Answer

Other Day

Status : Correct **Marks : 1/1**

10. What will be the output of the following code?

```
public class Main {
   public static void main(String[] args) {
      int i = 1;
      while(i < 10) {
         i += 2;
      }
```

```
        System.out.println(i);
    }
}
```

Answer

11

Status : Correct ***Marks : 1/1***

11. What will be the output of the following code?

```
public class Main {
    public static void main(String[] args) {
        int i = 10;
        do {
            System.out.print(i + " ");
            i -= 3;
        } while(i > 0);
    }
}
```

Answer

10 7 4 1

Status : Correct ***Marks : 1/1***

12. What will be the output of the following code?

```
class LoopTest {
    public static void main(String[] args) {
        int i = 1;
        do {
            System.out.print(i + " ");
            i *= 2;
        } while (i <= 8);
    }
}
```

Answer

1 2 4 8

Status : Correct **Marks : 1/1**

13. What will be the output of the following code?

```
class Test {
   public static void main(String[] args) {
      int x = 5, y = 2;
      if (x + y == 10)
         System.out.print("Ten");
      else if (x - y == 3)
         System.out.print("Three");
      else
         System.out.print("None");
   }
}
```

Answer

Three

Status : Correct **Marks : 1/1**

14. What will be the output of the following code?

```
class ConditionTest {
   public static void main(String[] args) {
      int x = 10;
      if (x > 5)
         System.out.print("High");
   }
}
```

Answer

High

Status : Correct **Marks : 1/1**

15. What will be the output of the following code?

```
class Test {
   public static void main(String[] args) {
      int num = 15;
      if (num > 10)
         if (num % 3 == 0)
            System.out.print("Divisible");
         else
            System.out.print("Not Divisible");
   }
}
```

Answer

Divisible

Status : Correct ***Marks : 1/1***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

John is a fitness trainer, and he wants to use the BMI calculator to assess the body mass index of his clients. He has a list of clients based on their height and weight.

John plans to write a program to quickly determine the BMI and provide a classification for each client.

If BMI is less than 18.5, the program will classify it as "Underweight"If BMI is between 18.6 and 24.9, the program will classify it as "Normal Weight"If BMI is between 25.0 and 29.9, the program will classify it as "Overweight"If BMI is 30.0 or higher, the program will classify it as "Obese"

Note: Formula to calculate BMI = weight/(height*height)

Input Format

The first line of input consists of a double value, representing the height of the person in meters.

The second line consists of a double value, representing the weight of the person in kilograms.

Output Format

The first line of output prints "BMI: " followed by a double (rounded to two decimal places) representing the calculated BMI.

The second line prints "Classification: " followed by a string indicating the BMI category (Underweight, Normal Weight, Overweight, or Obese).

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1.2
45.2

Output: BMI: 31.39
Classification: Obese

Answer

```
// You are using Java
import java.util.Scanner;
class main{
   public static void main(String args[]){
      Scanner r=new Scanner(System.in);
      double n=r.nextDouble();
      double m=r.nextDouble();
      double bmi=m/(n*n);
      System.out.printf("BMI: %.2f\n",bmi);
      if (bmi<18.5){
         System.out.println("Classification: Underweight");
      }
      else if(bmi<=18.6 || bmi<=24.9){
         System.out.println("Classification: Normal weight");
      }
      else if(bmi<=25.0 || bmi<=29.9){
         System.out.println("Classification: Overweight");
```

```
        }
        else{
            System.out.println("Classification: Obese");
        }
    }
}
```

Status : Correct **Marks : 10/10**

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Ted, the computer science enthusiast, has accepted the challenge of writing a program that checks if the number of digits in an integer matches the sum of its digits.

Guide Ted in designing and writing the code to solve this problem using a 'do-while' loop.

Input Format

The input consists of an integer N, representing the number to be checked.

Output Format

If the sum is equal to the number of digits, print "The number of digits in N matches the sum of its digits."

Else, print "The number of digits in N does not match the sum of its digits."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 20

Output: The number of digits in 20 matches the sum of its digits.

Answer

```
// You are using Java
import java.util.Scanner;
class main{
    public static void main(String args[]){
        Scanner r=new Scanner(System.in);
        int n=r.nextInt();
        int temp=n;
        int sum=0;
        int count =0;
        do{
            int digit = temp%10;
            sum+=digit;
            count++;
            temp/=10;

        }
        while(temp>0);
            if(sum==count){
                System.out.println("The number of digits in " + n + " matches the sum of
its digits.");
            }
            else{
                System.out.println("The number of digits in " + n + " does not match the
sum of its digits.");
            }
    }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 9

Section 1 : Coding

1. Problem Statement

Amit wants to evaluate the depreciation of his car over time to understand its current value and categorize it based on that value.

Write a program that helps him determine the current value of his car after a certain number of years of depreciation and classify it into one of three categories:

High: If the current value is greater than 10,000.Medium: If the current value is between 5,000 and 10,000, both inclusive.Low: If the current value is less than 5,000.

The depreciation rate of the car is 15% per year. The program should calculate the current value of the car after applying this depreciation over the given number of years and print the current value along with the category.

Input Format

The first line of input consists of an integer, representing the initial cost of the car.

The second line consists of an integer, representing the number of years the car has been depreciating.

Output Format

The first line of output prints a double value, representing the current value of the car, rounded off to two decimal places "Current Value: <value>".

The second line prints its category "Category: <categories>".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 20000
5
Output: Current Value: 8874.11
Category: Medium

Answer

```
// You are using Java
import java.util.Scanner;
class main{
    public static void main(String args[]){
        Scanner r=new Scanner(System.in);
        int c=r.nextInt();
        int n=r.nextInt();
        double d=0.15;
        double current=c*Math.pow(1-0.15,n);
        System.out.printf("Current Value: %.2f\n",current);
        if(current>10000){
            System.out.println("Category: High");
        }
        else if(current>5000 && current<10000){
            System.out.println("Category: Medium");
        }
```

```
        else{
            System.out.println("Category: Low");
        }
    }
}
```

Status : Partially correct **Marks : 9/10**

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q6

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Maya, a student in an arts and crafts class, wants to create a pattern using stars (*) in a specific format. She plans to use a program to help her construct the pattern.

Write a program that takes an integer as input and constructs the following pattern using nested for loops.

Input: 5

Output:

*
* *

```
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```

Input Format

The input consists of a number (integer) representing the number of rows.

Output Format

The output displays the required pattern.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 5
Output:
```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```

Answer

```
// You are using Java
import java.util.Scanner;
class main{
    public static void main(String args[]){
        Scanner r=new Scanner(System.in);
```

```
        int n=r.nextInt();
        for(int i=1;i<=n;i++){
            for(int j=1;j<=i;j++){
                System.out.print("* ");

            }
            System.out.println();
        }
        for(int i=n-1;i>=1;i--){
            for(int j=1;j<=i;j++){
                System.out.print("* ");
            }
            System.out.println();
        }
    }
}
```

Status : Correct **Marks : 10/10**

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q7

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

You are taking part in a coding challenge where your task is to design a program that conjures a mesmerizing numerical pyramid pattern. The enchanting pattern is fashioned using a for loop and is customized based on user input.

Participants are prompted to unveil the pyramid's magic by specifying its height - essentially dictating the number of rows in this spellbinding creation.

Write a program that employs to weave this captivating numerical pyramid as shown below.

Example

Input:
4

Output:

Input Format

The input consists of a positive integer n representing the number of rows in the pattern.

Output Format

The output prints the required pyramid pattern, as shown in the sample output.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 4

Output: 1
 123
 12345
1234567

Answer

```
// You are using Java
import java.util.Scanner;
class main{
    public static void main(String args[]){
        Scanner r=new Scanner(System.in);
        int n=r.nextInt();
        int p=1;
        for(int i=1;i<=n;i++){
            for(int j=1;j<=p;j++){
                System.out.print(j);
            }
            p+=2;
        }
    }
```

```
}
```

Status : Correct *Marks : 10/10*

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 2_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Ted, the computer science enthusiast, has accepted the challenge of writing a program that checks if the number of digits in an integer matches the sum of its digits.

Guide Ted in designing and writing the code to solve this problem using a 'do-while' loop.

Input Format

The input consists of an integer N, representing the number to be checked.

Output Format

If the sum is equal to the number of digits, print "The number of digits in N matches the sum of its digits."

Else, print "The number of digits in N does not match the sum of its digits."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 20

Output: The number of digits in 20 matches the sum of its digits.

Answer

```
// You are using Java
import java.util.Scanner;
class main{
    public static void main(String args[]){
        Scanner r=new Scanner(System.in);
        int n=r.nextInt();
        int temp=n;
        int sum=0;
        int count =0;
        do{
            int digit = temp%10;
            sum+=digit;
            count++;
            temp/=10;

        }
        while(temp>0);
            if(sum==count){
                System.out.println("The number of digits in " + n + " matches the sum of
its digits.");
            }
            else{
                System.out.println("The number of digits in " + n + " does not match the
sum of its digits.");
            }
    }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 10_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : COD

1. Problem Statement

John is organizing a fruit festival, and the quantities of various fruits are stored in a HashMap where fruit names are keys and quantities are values.

Help him develop a program to find the total quantity of fruits for the festival by summing up the values in the HashMap.

Input Format

The input consists of fruit quantities in the format 'fruitName:quantity', where fruitName is the name of the fruit(a string), and quantity is a double value representing the quantity.

The input is terminated by entering "done".

Output Format

The output prints a double value, representing the sum of values in the HashMap, rounded off to two decimal places.

If the value is not numeric, print "Invalid input".

If any special characters other than ':' are entered, print "Invalid format".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: Banana:15.2
Orange:56.3
Mango:47.3
done

Output: 118.80

Answer

```
// You are using Java
import java.util.*;

public class Main {
    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);
        HashMap<String, Double> map = new HashMap<>();
        double sum = 0;
        boolean invalidInput = false;
        boolean invalidFormat = false;

        while (true) {
            String line = sc.nextLine();

            if (line.equals("done")) {
                break;
            }

            // Check if contains exactly one ':'
            if (!line.contains(":") || line.startsWith(":") || line.endsWith(":") ||
line.indexOf(":") != line.lastIndexOf(":")) {
```

```
            invalidFormat = true;
            break;
        }

        // Check for special characters other than letters and ':'
        for (int i = 0; i < line.length(); i++) {
            char c = line.charAt(i);
            if (!(Character.isLetter(c) || c == ':' || Character.isDigit(c) || c == '.')) {
                invalidFormat = true;
                break;
            }
        }

        if (invalidFormat) break;

        String[] parts = line.split(":");
        String fruit = parts[0];
        String qtyString = parts[1];

        try {
            double qty = Double.parseDouble(qtyString);
            map.put(fruit, qty);
        } catch (Exception e) {
            invalidInput = true;
            break;
        }
    }

    if (invalidFormat) {
        System.out.println("Invalid format");
        return;
    }

    if (invalidInput) {
        System.out.println("Invalid input");
        return;
    }

    for (String key : map.keySet()) {
        sum += map.get(key);
    }
```

```
        System.out.printf("%.2f", sum);
    }
}
```

Status : Correct **Marks : 10/10**

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 10_Q4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : COD

1. Problem Statement

In a ticket reservation system, you store the available seat numbers in a TreeSet. Users input their desired seat number, and the program checks whether the chosen seat is available.

Using a TreeSet ensures quick and efficient verification of seat availability, ensuring a smooth and organized ticket booking process.

Input Format

The first line of input contains a single integer n, representing the number of available seats.

The second line contains n space-separated integers, representing the available seat numbers.

The third line contains an integer m, representing the seat number that needs to be searched.

Output Format

The output displays "[m] is present!" if the given seat is available. Otherwise, it displays "[m] is not present!"

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 4
2 4 5 6
5
Output: 5 is present!

Answer

```
// You are using Java
import java.util.*;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        int n = sc.nextInt();
        Set<Integer> seats = new TreeSet<>();

        for (int i = 0; i < n; i++) {
            seats.add(sc.nextInt());
        }

        int m = sc.nextInt();

        if (seats.contains(m)) {
            System.out.println(m + " is present!");
        } else {
            System.out.println(m + " is not present!");
        }
    }
}
```

Status : Correct *Marks : 10/10*

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 5_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. What will be the output of the following code?

```
class Person {
    String name;
    void setName(String n) {
        name = n;
    }
    void printName() {
        System.out.println(name);
    }
}

class Test {
    public static void main(String[] args) {
        Person p = new Person();
        p.printName();
```

```
    }
}
```

Answer

null

Status : Correct ***Marks : 1/1***

2. What will be the output of the following code?

```
class A {
    int x = 50;
}

public class Main {
    public static void main(String[] args) {
        A obj1 = new A();
        A obj2 = obj1;
        obj2.x = 100;
        System.out.println(obj1.x);
    }
}
```

Answer

100

Status : Correct ***Marks : 1/1***

3. What will be the output of the following code?

```
class A {
    int val = 20;
}

public class Main {
    public static void main(String[] args) {
        A obj1 = new A();
        A obj2 = obj1;
        obj2.val += 5;
```

```
        System.out.println(obj1.val);
    }
}
```

Answer

25

Status : Correct ***Marks : 1/1***

4. What will be the output of the following code?

```
class Alpha {
    void greet(String name) {
        System.out.println("Hello " + name);
    }
}

public class Main {
    public static void main(String[] args) {
        Alpha obj = new Alpha();
        obj.greet("Anu");
    }
}
```

Answer

Hello Anu

Status : Correct ***Marks : 1/1***

5. What will be the output of the following code?

```
class A {
    int y = 30;
}

public class Main {
    public static void main(String[] args) {
        A a1 = new A();
        A a2 = new A();
```

```
        a1.y = 50;
        System.out.println(a2.y);
    }
}
```

Answer

30

Status : Correct ***Marks : 1/1***

6. What is the output of the following code?

```
class Box {
    int height;
    Box(int height) {
        this.height = height;
    }
    void modifyHeight(Box b) {
        b.height += 10;
    }
}
public class Main {
    public static void main(String[] args) {
        Box b1 = new Box(20);
        b1.modifyHeight(b1);
        System.out.println(b1.height);
    }
}
```

Answer

30

Status : Correct ***Marks : 1/1***

7. What will be the output of the following code?

```
class Box {
    int volume(int l, int b, int h) {
        return l * b * h;
```

```
    }
}

public class Main {
    public static void main(String[] args) {
        Box b = new Box();
        System.out.println(b.volume(2, 3, 4));
    }
}
```

Answer

24

Status : Correct ***Marks : 1/1***

8. What will be the output of the following code?

```
class Ball {
    int size = 11;
}

class Game {
    public static void main(String[] args) {
        Ball b1 = new Ball();
        Ball b2 = new Ball();
        b2.size = 10;
        System.out.println(b1.size);
    }
}
```

Answer

11

Status : Correct ***Marks : 1/1***

9. What will be the output of the following code?

```
class Test {
    private int value;
```

```
    Test(int value) {
        this.value = value;
    }
    public int getValue() {
        return value;
    }
}
public class Main {
    public static void main(String[] args) {
        Test obj = new Test(10);
        System.out.println(obj.value);
    }
}
```

Answer

Compile-time error

Status : Correct ***Marks : 1/1***

10. What will be the output of the following code?

```
class Box {
    int length = 5;
    int width = 4;

    int area() {
        return length * width;
    }

    public static void main(String[] args) {
        Box b = new Box();
        System.out.println("Area = " + b.area());
    }
}
```

Answer

Area = 20

Status : Correct ***Marks : 1/1***

11. What will be the output of the following code?

```
class Person {
   int age = 18;
}

public class Main {
   public static void main(String[] args) {
      Person p = new Person();
      p.age += 2;
      System.out.println("Age: " + p.age);
   }
}
```

Answer

Age: 20

Status : Correct ***Marks : 1/1***

12. What will be the output of the following code?

```
class Sample {
   int x = 10;

   void display() {
      System.out.println("x = " + x);
   }

   public static void main(String[] args) {
      Sample s = new Sample();
      s.display();
   }
}
```

Answer

x = 10

Status : Correct ***Marks : 1/1***

13. What will be the output of the following code?

```
class A {
   int p = 5;
   int q = 2;
}

class Main {
   public static void main(String[] args) {
      A obj = new A();
      System.out.println(obj.p + obj.q);
   }
}
```

Answer

7

Status : Correct ***Marks : 1/1***

14. What will be the output of the following code?

```
class Demo {
   void printMessage() {
      System.out.println("Hello from Demo");
   }
}

public class Main {
   public static void main(String[] args) {
      Demo d = new Demo();
      d.printMessage();
   }
}
```

Answer

Hello from Demo

Status : Correct ***Marks : 1/1***

15. What will be the output of the following code?

```
class MathUtils {
    int add(int x) {
        return x + x;
    }
}

public class Main {
    public static void main(String[] args) {
        MathUtils m = new MathUtils();
        System.out.println(m.add(5));
    }
}
```

Answer

10

Status : Correct ***Marks : 1/1***

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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 6_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 13

Section 1 : MCQ

1. What will be the output of the following program?

```
class A {
  public int i;
  private int j;
}
class B extends A {
   void display() {
     super.j = super.i + 1;
     System.out.println(super.i + " " + super.j);
   }
}
class inheritance {
  public static void main(String args[]) {
     B obj = new B();
     obj.i=1;
```

```
    obj.j=2;
    obj.display();
  }
}
```

Answer

Compile Time Error

Status : Correct ***Marks : 1/1***

2. What will be the output of the following program?

```
class A {
  int x = 10;
}

class B extends A {
  int x = 20;
}

class C extends B {
  int x = 30;

  void display() {
    System.out.println(x);
    System.out.println(super.x);
  }
}

class Test {
  public static void main(String[] args) {
    C obj = new C();
    obj.display();
  }
}
```

Answer

3020

Status : Correct ***Marks : 1/1***

3. Which of the following is the correct way for class B to inherit from class A?

Answer

class B extends class A {}

Status : Wrong ***Marks : 0/1***

4. What will be the output of the following Java program?

```
class Parent {
    void show() {
        System.out.println("Parent class");
    }
}
class Child extends Parent {
    void show() {
        System.out.println("Child class");
    }
}
class Test {
    public static void main(String[] args) {
        Parent obj = new Child();
        obj.show();
    }
}
```

Answer

Child class

Status : Correct ***Marks : 1/1***

5. What will be the output of the following Java program?

```
class A {
    void display() {
        System.out.println("Class A");
    }
```

```
}

class B extends A {
    void show() {
        System.out.println("Class B");
    }
}

class C extends B {
    void print() {
        System.out.println("Class C");
    }
}

class Test {
    public static void main(String[] args) {
        C obj = new C();
        obj.display();
        obj.show();
        obj.print();
    }
}
```

Answer

Class AClass BClass C

Status : Correct ***Marks : 1/1***

6. What will be the output of the following Java program?

```
class Test {
    void display(int a, int b) {
        System.out.println("Method 1");
    }
    void display(double a, double b) {
        System.out.println("Method 2");
    }
    public static void main(String[] args) {
        Test obj = new Test();
```

```
    obj.display(10, 10.0);
  }
}
```

Answer

Compilation error

Status : Wrong ***Marks : 0/1***

7. What will be the output of the following Java program?

```
class Test {
  void show(int a) {
    System.out.println("Integer method");
  }
  void show(String s) {
    System.out.println("String method");
  }
  public static void main(String[] args) {
    Test obj = new Test();
    obj.show(null);
  }
}
```

Answer

String method

Status : Correct ***Marks : 1/1***

8. What will be the output of the following Java program?

```
class Vehicle {
  void start() {
    System.out.println("Vehicle starts");
  }
}
class Car extends Vehicle {

  void start() {
```

```
        System.out.println("Car starts");
    }
}
class ElectricCar extends Car {
    void start() {
        System.out.println("Electric Car starts silently");
    }
}
class Test {
    public static void main(String[] args) {
        Vehicle v = new ElectricCar();
        v.start();
    }
}
```

Answer

Electric Car starts silently

Status : Correct ***Marks : 1/1***

9. Select the correct keyword for implementing inheritance through the class.

Answer

extends

Status : Correct ***Marks : 1/1***

10. What will be the output of the following code?

```
class A {
    int sum(int x) {
        return x + 2;
    }
}

class B extends A {
    int sum(int x) {
```

```
        return super.sum(x) * 2;
    }
}

class C extends B {
    int sum(int x) {
        return super.sum(x) - 3;
    }
}

class Test {
    public static void main(String[] args) {
        C obj = new C();
        System.out.println(obj.sum(4));
    }
}
```

Answer

9

Status : Correct ***Marks : 1/1***

11. What will be the output of the following Java program?

```
class Vehicle {
    void startEngine() {
        System.out.println("Vehicle engine started");
    }
}

class Car extends Vehicle {
    void startEngine() {
        System.out.println("Car engine started");
    }
}

class Main {
    public static void main(String[] args) {
        Vehicle myVehicle = new Car();
```

```
    myVehicle.startEngine();
  }
}
```

Answer

Car engine started

Status : Correct ***Marks : 1/1***

12. Which of the following is true about method overriding in Java?

Answer

The method must have the same name, same parameters, and must be in different classes with an inheritance relationship

Status : Correct ***Marks : 1/1***

13. What will be the output of the following Java program?

```
class A {
  int value = 10;
  void display() {
    System.out.println("A's display: " + value);
  }
}
class B extends A {
  int value = 20;
  void display() {
    System.out.println("B's display: " + value);
  }
}
class Test {
  public static void main(String[] args) {
    A obj = new B();
    obj.display();
    System.out.println("Value: " + obj.value);
  }
}
```

Answer

B's display: 20 Value: 10

Status : Correct ***Marks : 1/1***

14. What will be the output of the following program?

```
class Vehicle {
   String type = "Vehicle";
}

class Car extends Vehicle {
   String type = "Car";
}

class Test {
   public static void main(String[] args) {
      Car c = new Car();
      System.out.println(c.type);
   }
}
```

Answer

Car

Status : Correct ***Marks : 1/1***

15. What will be the output of the following code?

```
class A {
   void display() {
      System.out.println("Display A");
   }
}

class B extends A {
   void display() {
      System.out.println("Display B");
```

```
    }
}

class C extends B {
    void display() {
        super.display();
    }
}

class Test {
    public static void main(String[] args) {
        C obj = new C();
        obj.display();
    }
}
```

Answer

Display B

Status : Correct ***Marks : 1/1***

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2024_28_III_OOPS Using Java Lab

REC_Week 12_Java_Lamba Expressions_MCQ

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : MCQ

1. Which functional interface in Java takes two arguments and returns a result?

Answer

BiFunction

Status : Correct ***Marks : 1/1***

2. What is the return type of a lambda expression in Java?

Answer

The return type is inferred from the context

Status : Correct ***Marks : 1/1***

3. Which functional interface is commonly used with lambda expressions in Java?

Answer

Runnable

Status : Correct ***Marks : 1/1***

4. Can a lambda expression in Java have a body with multiple statements?

Answer

Yes, if the statements are enclosed in curly braces

Status : Correct ***Marks : 1/1***

5. Which of the following interfaces is NOT a functional interface in Java?

Answer

Iterable

Status : Correct ***Marks : 1/1***

6. What is the syntax for a basic lambda expression in Java?

Answer

(parameters) -> expression

Status : Correct ***Marks : 1/1***

7. Can a lambda expression have more than one parameter?

Answer

Yes, it can have multiple parameters

Status : Correct ***Marks : 1/1***

8. Can a lambda expression in Java have a body with multiple statements?

Answer

Yes, if the statements are enclosed in curly braces

Status : Correct ***Marks : 1/1***

9. What is a lambda expression in Java?

Answer

A way to define anonymous methods

Status : Correct ***Marks : 1/1***

10. Which of the following is a valid lambda expression in Java?

Answer

All of the mentioned options

Status : Correct ***Marks : 1/1***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 12_Q3

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

In the mystical realm of programming, there exists a magical incantation to reveal hidden words.

Elara, the skilled enchantress, wishes to summon a word using her spell and then reverse its characters to uncover its enchanted reflection.

Write a program that uses the predefined functional interface Supplier<String> and a lambda expression to:

Supply (generate) a string, and

Display its reversed form.

Input Format

No input is required from the user.

The string must be supplied internally using a Supplier<String>.

Output Format

Print the reversed version of the supplied string.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: Wizard!!
Output: !!draziW

Answer

```
// You are using Java
import java.util.Scanner;
import java.util.function.Supplier;

class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        // Read the string internally (platform may supply it)
        String input = sc.nextLine();

        // Supplier that supplies the string
        Supplier<String> supplier = () -> input;

        // Reverse the supplied string
        String reversed = new StringBuilder(supplier.get()).reverse().toString();

        System.out.println(reversed);
        sc.close();
    }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 12_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Sabrina is working on a project that involves analyzing a set of numbers. In her exploration, she encounters scenarios where extracting even numbers and finding their sum is essential.

Create a program that calculates the sum of even numbers from a given array of integers using a lambda expression.

Input Format

The first line of input consists of an integer N, representing the size of the array.

The second line consists of N space-separated integers, representing the elements of the array.

Output Format

The output prints the sum of the even integers from the array.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 3
29 37 45

Output: 0

Answer

```
// You are using Java
import java.util.*;
import java.util.stream.*;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        int n = sc.nextInt();
        int[] arr = new int[n];

        for (int i = 0; i < n; i++)
            arr[i] = sc.nextInt();

        int sum = Arrays.stream(arr)
                        .filter(x -> x % 2 == 0)   // lambda expression
                        .sum();

        System.out.println(sum);
    }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 10_Q1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : COD

1. Problem Statement

A city traffic management system needs to track vehicles entering a toll booth. Each vehicle is uniquely identified by its registration number. The system should allow adding vehicles to a record, ensuring that no duplicate registration numbers exist. The vehicles should be stored in a HashSet, which does not guarantee any specific order.

Your task is to implement a program using a HashSet that allows adding vehicle details and displaying the records.

Input Format

The first line of input contains an integer N - the number of vehicles.

The next N lines contain details of each vehicle in the format: "RegNumber

OwnerName VehicleType"

1. RegNumber (String) - A unique registration number (Alphanumeric).
2. OwnerName (String) - The name of the vehicle owner.
3. VehicleType (String, Car, Bike, or Truck) - The type of vehicle.

If a vehicle with the same registration number is already present, ignore the duplicate entry.

Output Format

The output prints the unique vehicle records in any order (since HashSet does not maintain order).

Output format: "RegNumber OwnerName VehicleType"

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5
KA01AB1234 John Car
MH02CD5678 Alice Bike
DL03EF9012 Bob Truck
TN04GH3456 Mike Car
KA01AB1234 John Car
Output: TN04GH3456 Mike Car
KA01AB1234 John Car
MH02CD5678 Alice Bike
DL03EF9012 Bob Truck

Answer

```
import java.util.*;

class Vehicle {
   String reg;
   String owner;
   String type;

   Vehicle(String reg, String owner, String type) {
      this.reg = reg;
```

```
        this.owner = owner;
        this.type = type;
    }

    // Define equality based on registration number
    @Override
    public boolean equals(Object obj) {
        if (this == obj) return true;
        if (!(obj instanceof Vehicle)) return false;
        Vehicle v = (Vehicle) obj;
        return this.reg.equals(v.reg);
    }

    @Override
    public int hashCode() {
        return reg.hashCode();
    }
}

public class Main {
    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        int n = sc.nextInt();
        HashSet<Vehicle> set = new HashSet<>();

        for (int i = 0; i < n; i++) {
            String reg = sc.next();
            String owner = sc.next();
            String type = sc.next();

            Vehicle v = new Vehicle(reg, owner, type);

            set.add(v);
        }


        if (set.isEmpty()) {
            return;
        }
```

```
        for (Vehicle v : set) {
            System.out.println(v.reg + " " + v.owner + " " + v.type);
        }
    }
}
```

Status : Correct ***Marks : 10/10***

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2024_28_III_OOPS Using Java Lab

REC_2028_OOPS using Java_Week 10_MCQ

Attempt : 1
Total Mark : 15
Marks Obtained : 15

Section 1 : MCQ

1. Which of the following allows null keys in Java?

Answer

HashMap

Status : Correct ***Marks : 1/1***

2. Which of the following is true about TreeMap?

Answer

It maintains natural ordering

Status : Correct ***Marks : 1/1***

3. Which of the following is true about HashMap?

Answer

It is not synchronized

Status : Correct ***Marks : 1/1***

4. What will be the output of the following code?

```
import java.util.*;
class Main {
   public static void main(String[] args) {
      HashMap<String, Integer> map = new HashMap<>();
      map.put("X", 10);
      map.put("Y", 20);
      map.put("Z", 30);
      map.remove("Y");
      System.out.println(map);
   }
}
```

Answer

{X=10, Z=30}

Status : Correct ***Marks : 1/1***

5. What happens when you add duplicate elements to a HashSet?

Answer

The duplicate is ignored

Status : Correct ***Marks : 1/1***

6. How does HashSet check for duplicate elements?

Answer

Using equals() and hashCode()

Status : Correct ***Marks : 1/1***

7. What will be the output of the following code?

```
import java.util.*;
class Main {
   public static void main(String[] args) {
      HashMap<String, Integer> map = new HashMap<>();
      map.put("A", 1);
      map.put("B", 2);
      map.put("C", 3);
      System.out.println(map.containsKey("B"));
   }
}
```

Answer

true

Status : Correct ***Marks : 1/1***

8. What is the time complexity of retrieving an element from a HashSet?

Answer

O(1)

Status : Correct ***Marks : 1/1***

9. Which method removes all elements from a Set?

Answer

clear()

Status : Correct ***Marks : 1/1***

10. What happens if two keys have the same hash code in a HashMap?

Answer

A linked list is used to store values with the same hash

Status : Correct **Marks : 1/1**

11. What will happen if you add a null element to a TreeSet?

Answer

An exception occurs

Status : Correct **Marks : 1/1**

12. What will be the output of the following code?

```
import java.util.*;
class Main {
   public static void main(String[] args) {
      HashMap<String, String> map = new HashMap<>();
      map.put("A", "Apple");
      map.put("B", "Banana");
      map.put("C", "Cherry");
      map.replace("B", "Blueberry");
      System.out.println(map);
   }
}
```

Answer

{A=Apple, B=Blueberry, C=Cherry}

Status : Correct **Marks : 1/1**

13. Which method retrieves the lowest key in a TreeMap?

Answer

firstKey()

Status : Correct **Marks : 1/1**

14. What will happen if you add elements in descending order in a

TreeSet?

Answer

They are sorted in ascending order

Status : Correct ***Marks : 1/1***

15. Which statement is true about HashSet and TreeSet?

Answer

TreeSet provides sorted elements

Status : Correct ***Marks : 1/1***

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2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 9_Q2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Vikram loves listening to music and wants to create a simple playlist manager using Java Collections. The playlist supports the following operations:

"ADD <song>" Adds the song to the end of the playlist."REMOVE <song>" Removes the first occurrence of the song from the playlist. If the song is not found, do nothing."SHOW" Displays all songs in the playlist in order. If the playlist is empty, print "EMPTY"."NEXT" Moves to the next song in the playlist and prints its name. If the playlist is empty, print "EMPTY".

The playlist maintains a "current song" position that starts at the first song when it's added. The NEXT command moves to the next song and prints it, wrapping around to the first song after reaching the last song. When removing songs, the current position adjusts accordingly to maintain

proper navigation.

Help Vikram implement this playlist manager.

Input Format

The first line of the input consists of an integer n, the number of operations.

The next n lines, each containing a command:

- "ADD <song>"
- "REMOVE <song>"
- "SHOW"
- "NEXT"

Output Format

For each "SHOW" command, print the songs in order, separated by spaces.

For each "NEXT" command, print the next song in the playlist.

If no song exists, print "EMPTY".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 7
ADD song1
ADD song2
SHOW
NEXT
REMOVE song2
SHOW
NEXT

Output: song1 song2
song2
song1
song1

Answer

```java
// You are using Java
import java.util.*;

public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        int n = Integer.parseInt(sc.nextLine());

        LinkedList<String> playlist = new LinkedList<>();
        int current = -1;

        for (int i = 0; i < n; i++) {
            String line = sc.nextLine();

            if (line.startsWith("ADD")) {
                String song = line.substring(4);
                playlist.add(song);
                if (current == -1) current = 0;
            }

            else if (line.startsWith("REMOVE")) {
                String song = line.substring(7).trim();
                int index = playlist.indexOf(song);
                if (index != -1) {
                    playlist.remove(index);
                    if (playlist.isEmpty()) {
                        current = -1;
                    } else {
                        if (index < current) current--;
                        if (current >= playlist.size()) current = 0;
                    }
                }
            }

            else if (line.equals("SHOW")) {
                if (playlist.isEmpty()) {
                    System.out.println("EMPTY");
                } else {
                    for (String s : playlist) System.out.print(s + " ");
                    System.out.println();
                }
            }
```

```
        else if (line.equals("NEXT")) {
            if (playlist.isEmpty()) {
                System.out.println("EMPTY");
            } else {
                current = (current + 1) % playlist.size();
                System.out.println(playlist.get(current));
            }
        }
    }
}
```

Status : Correct **Marks : 10/10**

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Batch: 2028
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Scan to verify results

2024_28_III_OOPS Using Java Lab

2028_REC_OOPS using Java_Week 8_Q5

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

In a file management system, users are required to provide a valid file name when creating new files. The system enforces specific rules for file names to maintain consistency and avoid potential issues. Your task is to implement a Java program named FileNameValidator that takes user input for a file name and validates it according to the specified rules.

Rules for Valid File Name:

The file name must consist of alphanumeric characters (letters and digits) only.The file name must have a minimum length of 3 characters.

Implement a custom exception, FileNameValidator, to handle cases where the entered filename does not meet the specified criteria.

Input Format

The input consists of a string S, representing the desired filename.

Output Format

The output is displayed in the following format:

If the entered file name meets the specified criteria, the program outputs

"Valid file name"

If the entered file name does not meet the criteria and triggers the InvalidFileNameException, the program outputs

"Error: Invalid file name. It must be alphanumeric and have a minimum length of 3 characters."

Refer to the sample output for formatting specifications.

Sample Test Case

Input: myfile123
Output: Valid file name

Answer

```
// You are using Java
import java.util.*;

class InvalidFileNameException extends Exception {
    public InvalidFileNameException(String msg) {
        super(msg);
    }
}

class FileNameValidator {

    public static void validate(String s) throws InvalidFileNameException {
        if (s.length() < 3 || !s.matches("[A-Za-z0-9]+")) {
            throw new InvalidFileNameException("Invalid");
        }
    }
```

```
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        String s = sc.nextLine();

        try {
            validate(s);
            System.out.println("Valid file name");
        }
        catch (InvalidFileNameException e) {
            System.out.println("Error: Invalid file name. It must be alphanumeric and
have a minimum length of 3 characters.");
        }
    }
}
```

Status : Correct ***Marks : 10/10***