CSA0993 - Programming in java for Application Development.

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Date: 26/7/24

① matrix addition Program.

```
Public class MatrixAddition{
    Public static void main(String[] args){
        int[][] mat1 = {{1,2},{5,3}};
        int[][] mat2 = {{2,3},{4,1}};
        int[][] mat_Sum = new int[2][2];
        for(int i=0;i<2;i++){
            for(int j=0;j<2;j++){
                mat_Sum[i][j] = mat1[i][j] + mat2[i][j];
                System.out.Print(mat_Sum[i][j]+" ");
            }
        System.out.println();
    }
}
```

Output:
3 5
9 4.

② write a program to print rectangle Symbol Pattern.

```
Import java.util.Scanner;
Public class rectangle pattern{
    Public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.Print("enter symbol:");
        char Symbol = input.next().charAt(0);
        System.out.Print("enter rows and columns:");
        int row = input.nextInt(), cols = input.nextInt();
```

```
        for(int i=0; i<rows; i++){
            for(int j=0; j<cols; j++) System.out.print(symbol+" ");
            System.out.println();
        }
    }
}
```

Output: enter Symbol: *
enter rows and columns : 3 5

→
```
* * * * *
* * * * *
* * * * *
```

(B2) Program to sort list of names in alphabetical ascending or descending.

```
Import java.util.Arrays;
Import java.util.Scanner;
Public class SortNames{
    Public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        String[] arr = {"Banana", "Apple", "Carrot", "Jack"};
        System.out.print("order (A/D): ");
        char order = input.next().charAt(0);
        Arrays.sort(arr, (a,b) -> order == 'A' ? a.compareTo(b) :
                                                 b.compareTo(a));
        Arrays.stream(arr).forEach(System.out::println);
        input.close();
    }
}
```

Input: Order (A/D): A

output: Apple
Banana
Carrot
Jack.

(14) Matrix multiplication Program?

```
class MatrixMultiplication{
    Public Static Void main(String[] args){
        int[][] mat1 = {{1,2},{5,3}};
        int[][] mat2 = {{2,3},{1,4}};
        int[][] result = new int[2][2];
        for(int i=0; i<2; i++){
            for(int j=0; j<2; j++){
                for(int k=0; k<2; k++){
                    result[i][j] += mat1[i][k] * mat2[k][j];
                }
            }
        }
        System.out.println("Mat Sum =");
        for(int i=0; i<2; i++){
            for(int j=0; j<2; j++){
                System.out.print(result[i][j]+" ");
            }
            System.out.println();
        }
    }
}
```

Output:

10 5
22 18

(15) write program print Pattern.

```
Import java.util.Scanner;
Public class patternPrinter{
    Public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.print("enter number to Printed:");
        int x = input.nextInt();
        System.Out.print("nor number of times Prints:");
        int n = input.nextInt();
```

```
        for (int i=1; i<=2*n-1; i++){
            int count = i<=n ? i : 2*n-i;
            System.out.println(String.valueOf(x).repeat(count));
        }
        input.close();
    }
}
```

Input: Enter number to printed : 1
near number of times prints : 2.

Output:
```
1
1 1
1 1 1
1 1
1
```

(6) to Print special character separately and no. of special character.

```
Import java.util.Scanner;
Public class Special character Counter{
    Public Static void main (String[] args){
        Scanner input = new Scanner (System.in);
        System.out.println("enter line of text:");
        String s = input.nextLine();
        int SP=0;
        System.out.Print("Special characters:");
        for (char ch: s.to char Array()){
            if(!character.is Letter Or Digit(ch)){
                SP++;
                System.Out.Print(ch);
            }
        }
        System.out.Print("\n\n Number of Special character :"+SP);
    }
}
```

Output: enter a line of text : #* hello
Special characters : #*
Number of special characters : 2.

(7) To Print all composite numbers between a and b.

```
Import java.util.Scanner;
Public class CompositeNumbers{
   Public static void main(String[] args){
      Scanner input = new Scanner(System.in);
       int a = input.nextInt();
       int b = input.nextInt();
       for(int i=a+1; i<b; i++){
          if(isComposite(i)){
             System.out.print(i+" ");
          }
       }
   }
   Public static boolean isComposite(int num){
      if(num<4) return false;
      for(int i=2; i<=Math.sqrt(num); i++){
         if(num%i==0) return true;
      }
      return false;
   }
}
```

input: 12 19

output: 14 15 16 18

(8) write a program to print inverted full pyramid pattern.

```
Import java.util.Scanner;
Public class InvertedPyramid{
   Public static void main(String[] args){
      int n = new Scanner(System.in).nextInt();
       for(int i=n; i>=1; i--){
          System.out.print(" ".repeat(n-i));
          System.out.print("* ".repeat(i));
       }
   }
}
```

Input: 3

Output:
```
* * *
 * *
  *
```

(9) find mean, median, mode of array of numbers.

```
Import java.util.*;
Public class statistics{
   Public static void main (String[] args){
      int[] a = {16, 18, 27, 16, 28, 21, 19};
       Arrays.sort(a);
       double mean = Arrays.stream(a).average().orElse(0);
       System.out.println("Mean :" + mean);
       double median = (a.length %2 == 0)? (a[a.length/2-1] + a[a.length/2])/2.0 : a[a.length/2];
       System.out.println("median :" + median);
       Map<Integer, Integer> countMap = new HashMap<>();
       int mode = a[0];
       for (int num : a){
        int count = countMap.merge(num, 1, Integer::sum);
          if (count > countMap.getOrDefault(mode, 0)) mode = num;
       }
       System.out.print("mode :" + mode);
   }
}
```

Output: Mean : 20.0 , median : 19.0
mode : 16.

(10) find factorial of n?

```
Import java.util.Scanner;
Public class Factorial{
   Public static void main (String[] args){
      Scanner input = new Scanner (System.in);
       int n = input.nextInt();
       int fact = 1;
       for (int i=1; i<=n; fact *= i++);
       System.out.printf(n + "factorial = " + fact);
   }
}
```

Input: 4.

Output: 4 factorial = 24.