Assignment-3 MCA

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COURSE: OOPS(JAVA)

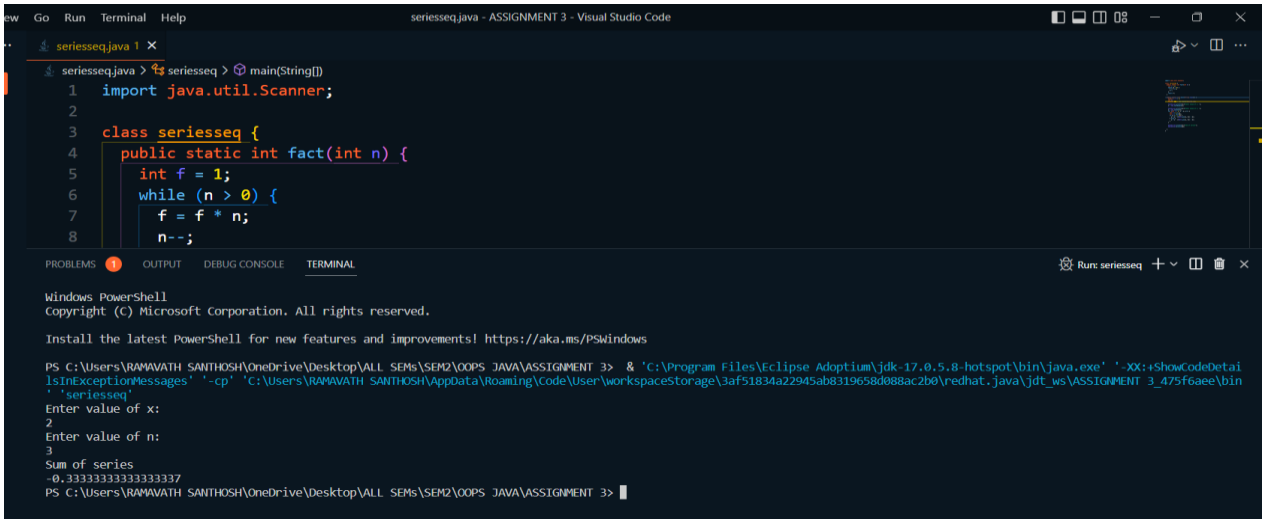
2ND SEMESTER, 1ST YEAR MCA

1) Write a JAVA program to compute the following Series and print the value of 'Y'.Y = 1 – (x2 /2!) + (x4 /4!) - (x6 /6!) + ……. till n terms.
Where, 'x' and 'n' is inputted by the user.

CODE:

```
import java.util.Scanner;


class seriesseq {
    public static int fact(int n) {
      int f = 1;
      while (n > 0) {
            f = f * n;
            n--;
      }
      return f;
    }


    public static void main(String args[]) {
      double x, y = 1;
      int n;
      Scanner obj = new Scanner(System.in);


      System.out.println("Enter value of x: ");
      x = obj.nextDouble();
```

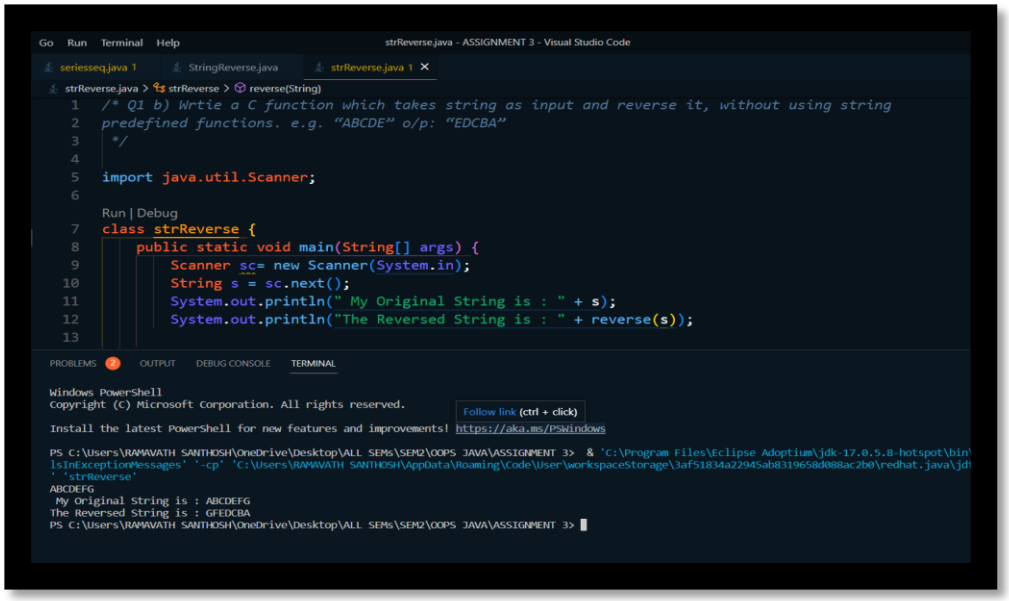
```
        System.out.println("Enter value of n: ");
        n = obj.nextInt();
        for (int i = 1; i < n; i++) {
            int k = 2 * i;
            int m = fact(k);
            if (i % 2 == 0) {
                y = y + ((Math.pow(x, k)) / m);
            } else {
                y = y - ((Math.pow(x, k)) / m);
            }
        }

        System.out.println("Sum of series");
        System.out.println(y);

    }
}
```



Wrtie a C function which takes string as input and reverse it, without using string predefined functions. e.g. “ABCDE” o/p: “EDCBA”

CODE:

```
import java.util.Scanner;

class strReverse {
	public static void main(String[] args) {
		Scanner sc= new Scanner(System.in);
		String s = sc.next();
		System.out.println(" My Original String is : " + s);
		System.out.println("The Reversed String is : " + reverse(s));
	}
  public static String reverse(String s) {
		int i = 0, j = s.length() - 1;
		char c[] = s.toCharArray();
		while (i < j) {
			char t = c[i];
			c[i] = c[j];
			c[j] = t;
			i++;
			j--;
		}
		String str = new String(c);
		return str;

	}
}
```



2) Write a java method insert(), to insert an integer x into a sorted array A[] (sorted inascending order) containing N integers so that the array remains sorted after insertion. The method takes x and array A as input and returns the index of x where it get inserted in A[]. Note: indicies starts from 0.

CODE:

```
import java.util.Arrays;

import java.util.Scanner;


public class SortedInsert {


    public static void main(String[] args) {
        int a[] = { 1, 2, 6, 7, 8 };
        System.out.println("Original Array: ");
        for (int i : a) {
            System.out.print(i + " ");
        }
        System.out.println();
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a value to insert: ");
        int v = sc.nextInt();
```

```
        System.out.println("Element must be added at " + findPos(a, v));

        int[] newArray = new int[a.length + 1];
        int i = 0;
        int j = 0;
        while (a[i] < v && i < a.length) {
            newArray[j++] = a[i++];
        }

        newArray[j++] = v;
        while (i < a.length) {
            newArray[j++] = a[i++];
        }

        a = Arrays.copyOf(newArray, j - 1);

        System.out.println("New Array: ");
        for (int x : a) {
            System.out.print(x + " ");
        }

    }

    public static int findPos(int[] a, int value) {
        int i = 0;
        while (a[i] < value) {
            i++;
        }
        return i;

    }
```

}

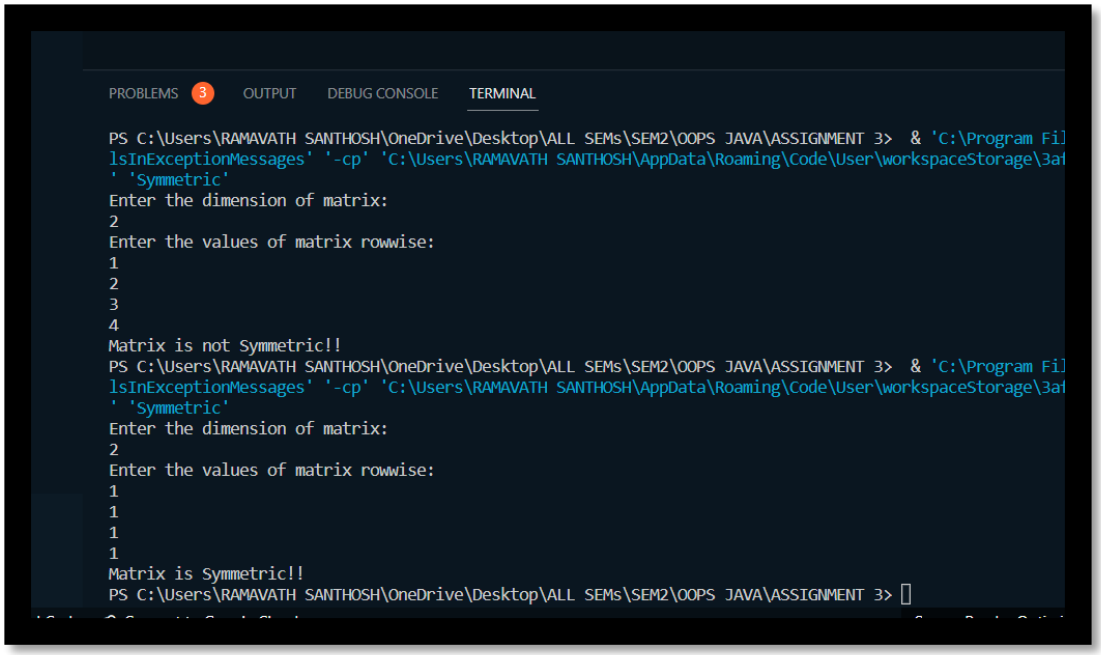
3) Write a java method which takes two dimensional integer array as input and prints whether the inputted matrix is symmetric.

Assume 2-D array is of size NxN, where N is known
constant. A matrix is said to be symmetric if it equals to its transpose .

CODE:

```
import java.io.*;
 class Symmetric {
      public static void main(String[] args)throws IOException {
            BufferedReader br= new BufferedReader(new InputStreamReader(System.in));
            System.out.println("Enter the dimension of matrix:");
            int n=Integer.parseInt(br.readLine());
            System.out.println("Enter the values of matrix rowwise: ");
            int a[][]=new int[n][n];
            for(int i=0;i<n;i++)
            {
                  for(int j=0;j<n;j++)
                  {
```

```
                        a[i][j]=Integer.parseInt(br.readLine());
                    }
                }
                if(sym(a,n))
                {
                    System.out.println("Matrix is Symmetric!!");
                }
                else
                {
                    System.out.println("Matrix is not Symmetric!!");

                }

        }
        public static boolean sym(int a[][],int n) {
                for(int i=0;i<n;i++)
                {
                    for(int j=0;j<n;j++)
                    {
                        if(a[i][j]!=a[j][i])
                        {
                            return false;
                        }
                    }
                }
                return true;
        }
}
```



4) Write a JAVA program to extract numeric characters from a given string and display the integer sum of all the numeric character's integral value.

CODE:

```
import java.io.*;
class StringToInt {
    public static void main(String[] args)throws IOException {
        BufferedReader br= new BufferedReader(new InputStreamReader(System.in));
        System.out.println("Enter numeric character: ");
        String s=(br.readLine());
        System.out.println(stoi(s));
    }
    public static int stoi(String s) {
        int i=0;
        int num=0;
        int sum=0;
        while(i<s.length())
        {
            char c=s.charAt(i);
```

```
            int x=(int)(c-'0');
            num=num*10+x;
            sum+=x;
            i++;
        }
        return sum;
    }
}
```

```
PS C:\Users\RAMAVATH SANTHOSH\OneDrive\Desktop\ALL S
lsInExceptionMessages' '-cp' 'C:\Users\RAMAVATH SANT
' 'StringToInt'
Enter numeric character:
1234
10
PS C:\Users\RAMAVATH SANTHOSH\OneDrive\Desktop\ALL S
```

5) Write a program to interchange corresponding elements of two single dimensional integer arrays of same size, say 'n'. Use function to interchange the elements and pass arrays as a parameters to the function.
E.g.: If A[]={1,2,3,4} and B[]={5,6,7,8} then A[]={5,6,7,8} and B[]={1,2,3,4}.

CODE:

```
import java.util.Arrays;

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

        int[] A = {1, 2, 3, 4};
        int[] B = {5, 6, 7, 8};
        interchange(A, B);
        System.out.println("My inputed string is A={1,2,3,4} and    B= {5,6,7,8} ");
        System.out.println("A: " + Arrays.toString(A));
        System.out.println("B: " + Arrays.toString(B));
```

```
    }

    public static void interchange(int[] A, int[] B) {
        for (int i = 0; i < A.length; i++) {
            int temp = A[i];
            A[i] = B[i];
            B[i] = temp;
        }
    }
}
```

```
PS C:\Users\RAMAVATH SANTHOSH\OneDrive\Desktop\ALL SEMs\SEM2\OOPS JAVA\ASSIGNMENT 3>
lsInExceptionMessages' '-cp' 'C:\Users\RAMAVATH SANTHOSH\AppData\Roaming\Code\User\wor
' 'ArrayInterchange'
My inputed string is A={1,2,3,4} and  B= {5,6,7,8}
A: [5, 6, 7, 8]
B: [1, 2, 3, 4]
PS C:\Users\RAMAVATH SANTHOSH\OneDrive\Desktop\ALL SEMs\SEM2\OOPS JAVA\ASSIGNMENT 3>
```

6) Write a Method rotate( ) which takes an input string and integer d and shifts all characterin the input string towards right by d elements. For example if input string is “apple” and d=2 then the Method changes the string to “leapp”.

CODE:

```
import java.io.*;
public class StringRotation {
    public static void main(String[] args)throws IOException {
        BufferedReader br= new BufferedReader(new InputStreamReader(System.in));
        System.out.println("Enter the string: ");
        String input=(br.readLine());
        //String input = "apple";

        int d= Integer.parseInt(br.readLine());
        //int d = 2;
        System.out.println(rotate(input, d));
    }
```

```
    public static String rotate(String input, int d) {
        String rotated = input.substring(input.length() - d) +
            input.substring(0, input.length() - d);
        return rotated;
    }
}
```

```
PS C:\Users\RAMAVATH SANTHOSH\OneDrive\Desktop\ALL SEMs\SEM2\OOPS JAVA\ASSIGNMENT 3>  & 'C:\Progr
lsInExceptionMessages' '-cp' 'C:\Users\RAMAVATH SANTHOSH\AppData\Roaming\Code\User\workspaceStora
' 'StringRotation'
Enter the string:
apple
3
pleap
PS C:\Users\RAMAVATH SANTHOSH\OneDrive\Desktop\ALL SEMs\SEM2\OOPS JAVA\ASSIGNMENT 3>  & 'C:\Progr
lsInExceptionMessages' '-cp' 'C:\Users\RAMAVATH SANTHOSH\AppData\Roaming\Code\User\workspaceStora
' 'StringRotation'
Enter the string:
apple
2
leapp
PS C:\Users\RAMAVATH SANTHOSH\OneDrive\Desktop\ALL SEMs\SEM2\OOPS JAVA\ASSIGNMENT 3>
```

7) The digital root of an integer n is defined as the result of summing the digits repeatedly until only a single digit remains. For example, the digital root of 1729 can be calculated using the following steps:
Step 1: 1+7+2+9 = 19
Step 2: 1+9 = 10
Step 3: 1+0 = 1
Because the total at the end of step 3 is the single digit 1, that value is the digital root. Write a method digitalRoot(n) that returns the digital root of its argument. Write the Method recursively without using any explicit loop constructs.

Note:- whatever concepts you know about PSCP use in java.

CODE:

```
import java.io.*;

public class DigitalRoot {

    public static void main(String[] args)throws IOException {

        BufferedReader br= new BufferedReader(new InputStreamReader(System.in));

        System.out.println("Enter atleast a two digit number :");

        int n=Integer.parseInt(br.readLine());

        System.out.println(digitalRoot(n));
```

```
    }
    public static int digitalRoot(int n) {
        if (n < 10) {
            return n;
        }
        int sum = 0;
        while (n > 0) {
            sum += n % 10;
            n /= 10;
        }
        return digitalRoot(sum);
    }
}
```

```
PS C:\Users\RAMAVATH SANTHOSH\OneDrive\Desktop\ALL SEMs\SEM2\OOPS JAVA\ASSIGNMENT 3>  & 'C:\Pr
lsInExceptionMessages' '-cp' 'C:\Users\RAMAVATH SANTHOSH\AppData\Roaming\Code\User\workspaceSt
' 'DigitalRoot'
Enter atleast a two digit number :
1729
1
PS C:\Users\RAMAVATH SANTHOSH\OneDrive\Desktop\ALL SEMs\SEM2\OOPS JAVA\ASSIGNMENT 3>  & 'C:\Pr
lsInExceptionMessages' '-cp' 'C:\Users\RAMAVATH SANTHOSH\AppData\Roaming\Code\User\workspaceSt
' 'DigitalRoot'
Enter atleast a two digit number :
99
9
PS C:\Users\RAMAVATH SANTHOSH\OneDrive\Desktop\ALL SEMs\SEM2\OOPS JAVA\ASSIGNMENT 3>
```