Assignment No-1

1. Implement a Java program to find the factorial of a given number.

—>

```
import java.util.*;
class factorial
{
	public static void main(String args[])
	{
		int n, fact=1;
		Scanner sc= new Scanner(System.in);
		System.out.println("Enter the number:");
		n=sc.nextInt();
		for(int I=1;i<=1;i++)
		{
			fact=fact*I;
		}
		System.out.println("Factorial= " +fact);
	}
}
```

Input
Enter the number: 5

Output
Factorial=120

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2. Implement a Java program to check whether a given number is prime or not. (Take the number as a command-line argument.)

—>

```
class PrimeCheck
{
	public static void main(String[] args)
	{
		if (args.length == 0)
		{
			System.out.println("Please provide a number as a command-line
			argument.");
			return;
		}
		int n = Integer.parseInt(args[0]);
		int flag = 0;
		for (int i = 2; i <= Math.sqrt(n); i++)
		{
			if (n % i == 0)
			{
				flag = 1;
				break;
			}
		}
			System.out.println(flag == 0 ? "Yes, it is Prime" : "Not a Prime Number");
		}
}
```

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→ javac PrimeCheck.java
→ java PrimeCheck 11

OUTPUT:
Yes, it is Prime

→ javac PrimeCheck.java
→ java PrimeCheck

OUTPUT:
Please provide a number as a command-line argument.

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3. Implement a Java program to sort a given list of 10 numbers in ascending order.

—>

```
import java.util.*;
class arrayasce
{
    public static void main(String args[])
    {
        int i, j, temp;
        a[]=new int [10];
        Scanner sc= new Scanner(System.in);
        System.out.println("Enter the array elements:");
        for(int I=0;i<=9;i++)
        {
            a[i]=sc.nextInt();
        }

        for(int I=0;i<=9;i++)
        {
            for(j=1;j<=9;j++)
            {
                if(a[I]<a[j])
                {
                    temp=a[I];
                    a[I]=a[j];
                    a[j]=temp;
                }
            }
        }

        System.out.println("Sorted Array :");
        for(int I=0;i<=9;i++)
        {
            System.out.print(a[I]);
```

Input
Enter the array elements:
22 33 12 34 9 64 23 45 21 11

Output
Sorted Array :
9 11 12 21 22 23 33 34 45 64

.

```
        }

    }
}
```

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4. Implement a Java program to merge two sorted arrays.

—>

```
import java.util.*;
public class mergearray
{
    public static void main(String args[])
    {
        int m=5,n=5,k=0,i=0,j=0;
        int a[]=new int[m];
        int b[]=new int[n];
        int c[]=new int[m+n];
        Scanner sc=new Scanner(System.in);
        System.out.print("Enter the elements in array a: ");
        for(i=0;i<5;i++)
        {
            a[i]=sc.nextInt();
        }

        System.out.print("Enter the elements in array b: ");
        for(j=0;j<5;j++)
        {
            b[j]=sc.nextInt();
        }

        i=0;j=0;
        while(i<m && j<n)
        {
            if(a[i]<b[j])
            {
                c[k]=a[i];
                i++;
                k++;
            }
            else
            {
                 c[k]=b[j];
                j++;
                k++;
            }

        }
        while(i<m)
        {
```

Input
Enter the elements in array a:
11 23 34 45 56
Enter the elements in array b:
55 57 87 90 87

Output
Merged array:
11 23 34 45 55 56 57 87 90 87

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```
                c[k]=a[i];
                i++;
                k++;
            }
            while(j<n)
            {
                c[k]=b[j];
                j++;
                k++;
            }

            System.out.println(“Merged array:");
             for(i=0;i<k;i++)
            {
                System.err.print(c[i]+" ");
            }

        }
    }
```

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5. Implement a Java program to perform 2×2 matrix multiplication, addition, and transpose (using a switch case).

—>

```
    import java.util.*;
    class MatrixOperations
    {
        public static void main(String args[])
        {
            int a[][] = new int[2][2];
            int b[][] = new int[2][2];
            int c[][] = new int[2][2];
            Scanner sc = new Scanner(System.in);
            System.out.println("Enter First 2x2 Matrix: ");
            for (int i = 0; i < 2; i++)
            {
                for (int j = 0; j < 2; j++)
                {
                    System.out.print("a[" + i + "][" + j + "] = ");
                    a[i][j] = sc.nextInt();
                }
            }
                 System.out.println("Enter Second 2x2 Matrix: “);

            for (int i = 0; i < 2; i++)
            {
                for (int j = 0; j < 2; j++)
                {
                    System.out.print("b[" + i + "][" + j + "] = ");
                    b[i][j] = sc.nextInt();
```

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```
        }
    }
    System.out.println("\nChoose an operation:");
    System.out.println("1. Addition");
    System.out.println("2. Multiplication");
    System.out.println("3. Transpose");
    System.out.print("Enter your choice: ");
    int choice = sc.nextInt();
    switch (choice)
    {
        case 1:
            System.out.println("\nAddition of Matrices:");
            for (int i = 0; i < 2; i++)
            {
                for (int j = 0; j < 2; j++)
                {
                    c[i][j] = a[i][j] + b[i][j];
                    System.out.print(c[i][j] + " ");
                }
                System.out.println();
            }
            break;

        case 2:
            System.out.println("\nMultiplication of Matrices:");
            for (int i = 0; i < 2; i++)
            {
                for (int j = 0; j < 2; j++)
                {
                    c[i][j] = 0;
                    for (int k = 0; k < 2; k++)
                    {
                        c[i][j] = c[i][j] + (a[i][k] * b[k][j]);
                    }
                    System.out.print(c[i][j] + " ");
                }
                System.out.println();
            }
            break;

        case 3:
            System.out.println("\nTranspose of First Matrix:");
            for (int i = 0; i < 2; i++)
            {
                for (int j = 0; j < 2; j++)
                {
                    System.out.print(a[j][i] + " “);
                }
```

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```
                        System.out.println();
                    }
                     System.out.println("\nTranspose of Second Matrix:");
                    for (int i = 0; i < 2; i++)
                    {
                        for (int j = 0; j < 2; j++)
                        {
                            System.out.print(b[j][i] + " ");
                        }
                        System.out.println();
                    }
                    break;

                default:
                    System.out.println("Invalid choice! Please select 1, 2, or 3.");
            }
            sc.close();
        }
    }
```

→ javac MatrixOperations.java
→ java MatrixOperations

OUTPUT:

```
Enter First 2x2 Matrix:
a[0][0] = 2
a[0][1] = 1
a[1][0] = 3
a[1][1] = 5

Enter Second 2x2 Matrix:
b[0][0] = 1
b[0][1] = 4
b[1][0] = 2
b[1][1] = 3

Choose an operation:
1. Addition
2. Multiplication
3. Transpose

Enter your choice: 3
Transpose of First Matrix:
2 3
1 5

Transpose of Second Matrix:
1 2
4 3
```

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