Assignment No	4
Title	Design a class ArrayUtilities with following functionalities, Calculator Interface & Calculator Functional Interface.
Objective	4.1.1 Maximum of array. 4.1.2 Minimum of array. 4.1.3 Find Mean of an array. 4.1.4 Find standard deviation of an array. 4.2.1 Design calculator Interface with 4 methods and implement it. Design a test class to Demonstrate it. 4.2.2 Design a Functional Interfaces to implement calculator
Roll No	MCA2511

Source Code:

```
//Design a class arrayutilities with following functionalities
//1. Maximum of array.
//2. Minimum of array.
//3. Find Mean of an array.
//4. Find standard deviation of an array.

class ArrayUtilities
{
	//instance variable
	int[] data;
	int size;

	//constructor
	ArrayUtilities(int size)
	{
		data = new int[size];
		this.size = size;
	}

	void setData(int[] data)
	{
		this.data = data;
	}

	//function to find max element of an array
	int findmax()
```

```
{
        int max = data[0];
        for(int i = 1; i<size; i++)
        {
                //check for max
                if(data[i]>max)
                {
                        max = data[i];
                }
        }
        return max;
}

//function to find min element of an array
int findmin()
{
        int min = data[0];
        for(int i = 1; i<size; i++)
        {
                //check for min
                if(data[i]<min)
                {
                        min = data[i];
                }
        }
        return min;
}

//function to find mean of an array
double findmean()
{
        double sum = 0;
        for(int i = 0; i<size; i++)
        {
                sum = sum + data[i];
        }

        return sum/size;
}

//function to find Standard Deviation
double findsd()
{
        double num = 0;
        for(int i=0; i<size; i++)
        {
```

```
                num = num + Math.pow((data[i]-findmean()),2);
            }
            return Math.sqrt(num/size);
        }


}
class ArrayUtilTest
{
        public static void main(String[] args)
        {
            int arr[] = {12,35,45,23,14};
            //int arr[] = {12,7,32,9,8};

            ArrayUtilities a1 = new ArrayUtilities(5);
            a1.setData(arr);
            System.out.println("Maximum of Array: " + a1.findmax());
            System.out.println("Minimum of Array: " + a1.findmin());
            System.out.println("Mean of Array: " + a1.findmean());
            System.out.println("Standard Deviation: " + a1.findsd());

        }
}
```

Output:

```
A:\MCA2511\JAVA\25-09-2025\4>javac ArrayUtilTest.java

A:\MCA2511\JAVA\25-09-2025\4>java ArrayUtilTest
Maximum of Array: 45
Minimum of Array: 12
Mean of Array: 25.8
Standard Deviation: 12.576167937809991
```

Source Code:

```
//Design calculator Interface with 4 methods and implement it. Design a test class to Demonstrate it.

interface ICalculator
{
	int add(int a,int b);
	int sub(int a,int b);
	int mul(int a,int b);
	int div(int a,int b);
}

class Calculator implements ICalculator
{
	public int add(int a, int b)	{return a+b;}
	public int sub(int a, int b)	{return a-b;}
	public int mul(int a, int b)	{return a*b;}
	public int div(int a, int b)	{return a/b;}
}

class CalculatorTest
{
	public static void main(String[] args)
	{
		Calculator c1 = new Calculator();
		int a = 22;
		int b = 4;
		System.out.println("Addition is "+c1.add(a,b));
		System.out.println("Subtraction is "+c1.sub(a,b));
		System.out.println("Multipliaction is "+c1.mul(a,b));
		System.out.println("Division is "+c1.div(a,b));
	}
}
```

Output:

```
A:\MCA2511\JAVA\25-09-2025\4>javac CalculatorTest.java

A:\MCA2511\JAVA\25-09-2025\4>java CalculatorTest
Addition is 26
Subtraction is 18
Multipliaction is 88
Division is 5
```

Source Code:

```
//Design a Functional Interfaces to implement calculator

interface ICalculatorLambda
{
	int operation(int a,int b);
}

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

		ICalculatorLambda add = (a,b) -> a+b;
		ICalculatorLambda sub = (a,b) -> a-b;
		ICalculatorLambda mul = (a,b) -> a*b;
		ICalculatorLambda div = (a,b) -> a/b;

		int a=22;
		int b=4;

		System.out.println("Addition is "+add.operation(a,b));
		System.out.println("Subtraction is "+sub.operation(a,b));
		System.out.println("Multiplication is "+mul.operation(a,b));
		System.out.println("Division is "+div.operation(a,b));


	}
}
```

Output:

```
A:\MCA2511\JAVA\25-09-2025\4>javac CalculatorTestLambda.java

A:\MCA2511\JAVA\25-09-2025\4>java CalculatorTestLambda
Addition is 26
Subtraction is 18
Multiplication is 88
Division is 5
```