TASK 5: Arrays & Basic Data Analysis Program

What is an Array?

An array is a collection of same-type data stored in continuous memory.

int[] numbers = {10, 20, 30, 40};

TYPES OF ARRAYS IN JAVA

Java mainly supports 5 types of arrays

1. Single-Dimensional Array
2. Multi-Dimensional Array
3. Two-Dimensional Array
4. Jagged Array
5. Anonymous Array

1.Single Dimensional Array

int[] numbers = {45, 12, 78, 34, 89, 23};

Meaning:

- int[] → integer array
- numbers → array name
- {...} → stored values

This creates memory like:

Index: 0 1 2 3 4 5

Value: 45 12 78 34 89 23

2. MULTI-DIMENSIONAL ARRAY

Definition

An array that contains another array inside it.

Array of arrays

Syntax

datatype[][] arrayName = new datatype[row][column];

Example

int[][] matrix = new int[3][3];

Representation

| 1 2 3 |

| 4 5 6 |

| 7 8 9 |

TWO-DIMENSIONAL ARRAY (2D Array

multi-dimensional array:-

Data stored in rows and columns

Example

```
int[][] marks = {
   {90, 80, 70},
   {85, 75, 65},
   {88, 78, 68}
};
```

Traversing 2D Array

```
for(int i = 0; i < marks.length; i++) {
   for(int j = 0; j < marks[i].length; j++) {
      System.out.print(marks[i][j] + " ");
   }
   System.out.println();
}
```

Memory Structure

marks → | ref | ref | ref |

↓ ↓ ↓

[90 80 70]

[85 75 65]

[88 78 68]

What is a Basic Data Analysis Program?

A Basic Data Analysis Program is a program that:

1. Takes numerical data
2. Stores it in a data structure (array)
3. Performs mathematical and logical operations
4. Extracts useful information (insights) from the data

Why Do We Need Data Analysis?

Data analysis helps to:

- Understand patterns
- Find highest / lowest values
- Calculate totals and averages
- Make decisions based on data

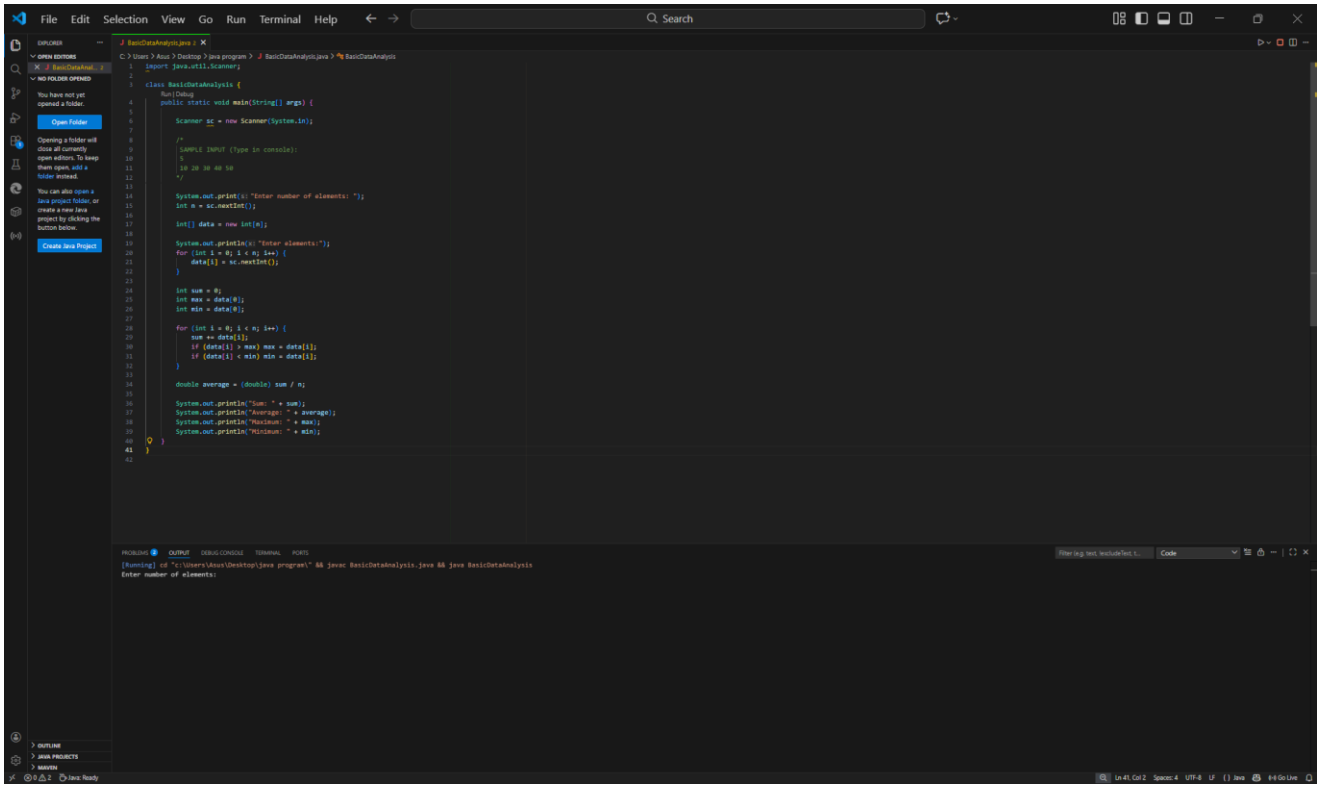
Real-life examples:

- Student marks analysis
- Monthly sales report
- Temperature readings
- Attendance percentage
- Salary analysiy

Components of a Basic Data Analysis Program

A basic data analysis program generally includes:

1. Data Collection
2. Data Storage
3. Data Processing
4. Data Analysis
5. Result Display
6. Error Handling


File Edit Selection View Go Run Terminal Help
Search
EXPLORER
OPEN EDITORS
NO FOLDER OPENED
You have not yet opened a folder.
Open Folder
Opening a folder will close all currently open editors. To keep them open, add a folder instead.
You can also open a Java project folder, or create a new Java project by clicking the button below.
Create Java Project
BasicDataAnalysis.java
C: > Users > Asus > Desktop > java program > BasicDataAnalysis.java > BasicDataAnalysis
import java.util.Scanner;
class BasicDataAnalysis {
Run | Debug
public static void main(String[] args) {
Scanner sc = new Scanner(System.in);
/*
SAMPLE INPUT (Type in console):
5
10 20 30 40 50
*/
System.out.print(s: "Enter number of elements: ");
int n = sc.nextInt();
int[] data = new int[n];
System.out.println(x: "Enter elements:");
for (int i = 0; i < n; i++) {
data[i] = sc.nextInt();
}
int sum = 0;
int max = data[0];
int min = data[0];
for (int i = 0; i < n; i++) {
sum += data[i];
if (data[i] > max) max = data[i];
if (data[i] < min) min = data[i];
}
double average = (double) sum / n;
System.out.println("Sum: " + sum);
System.out.println("Average: " + average);
System.out.println("Maximum: " + max);
System.out.println("Minimum: " + min);
}
}
PROBLEMS 2
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
Code
[Running] cd "c:\Users\Asus\Desktop\java program\" && javac BasicDataAnalysis.java && java BasicDataAnalysis
Enter number of elements:
OUTLINE
JAVA PROJECTS
MAVEN
Java: Ready
Ln 41, Col 2
Spaces: 4
UTF-8
LF
Java
Go Live