# OODP Workshop 5

1. Consider the following program specification:

Write a program that will prompt the user for 10 integer values and stores them in an array. The values entered by the user only be between 0 and 100 and the program should validate these appropriately. The program should then:

* Display the average of the values
* Display the highest value in the array
* Display the lowest value in the array
  1. Discuss how the values should be validated. What control structures could be used?

Ans:

To ensure values are between 0 and 100, you can use an **input validation loop** for each number. For example, inside a for loop (to collect all 10 values), you can use a while loop to re-prompt the user until they enter a valid number.

**Pseudocode for Validation:**

for (int i = 0; i < 10; i++) {

int input;

do {

System.out.print("Enter a value between 0 and 100: ");

input = scanner.nextInt();

} while (input < 0 || input > 100);

array[i] = input;

}

You would typically use the following control structures:

* **for loop** – to iterate through the array for input, processing, and displaying values.
* **while or do-while loop** – for validating individual input values.
* **if statements** – to find the highest and lowest values.

Full code:

import java.util.Scanner;

public class ScoreStatistics {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

int[] values = new int[10];

int sum = 0;

// Input with validation

for (int i = 0; i < values.length; i++) {

int input;

do {

System.out.print("Enter integer #" + (i + 1) + " (0–100): ");

input = scanner.nextInt();

if (input < 0 || input > 100) {

System.out.println("Invalid input. Please enter a number between 0 and 100.");

}

} while (input < 0 || input > 100);

values[i] = input;

sum += input;

}

// Calculate average, min, and max

double average = sum / 10.0;

int max = values[0];

int min = values[0];

for (int i = 1; i < values.length; i++) {

if (values[i] > max) {

max = values[i];

}

if (values[i] < min) {

min = values[i];

}

}

// Display results

System.out.println("\n=== Results ===");

System.out.printf("Average: %.2f\n", average);

System.out.println("Highest Value: " + max);

System.out.println("Lowest Value: " + min);

}

}

1. You have been asked to store the IDs and scores of competitors in three rounds of a game using a 2D Array and display the scores on the screen from the same 2D array. Following is the data:

|  |  |  |  |
| --- | --- | --- | --- |
| ID | Score 1 | Score 2 | Score 3 |
| 123 | 23 | 12 | 24 |
| 234 | 34 | 10 | 32 |
| 345 | 12 | 34 | 21 |
| 456 | 10 | 23 | 21 |
| 567 | 10 | 19 | 23 |

Ans:

public class CompetitorScores {

public static void main(String[] args) {

// 2D Array: {ID, Score1, Score2, Score3}

int[][] scores = {

{123, 23, 12, 24},

{234, 34, 10, 32},

{345, 12, 34, 21},

{456, 10, 23, 21},

{567, 10, 19, 23}

};

// Display header

System.out.println("ID\tScore 1\tScore 2\tScore 3");

// Display each competitor's data

for (int i = 0; i < scores.length; i++) {

for (int j = 0; j < scores[i].length; j++) {

System.out.print(scores[i][j] + "\t");

}

System.out.println();

}

}

}