

```
public class ArrayDataAnalysis {  
    public ArrayDataAnalysis() {  
    }  
  
    public static void main(String[] var0) {  
        int[] var1 = new int[]{45, 12, 78, 34, 89, 23};  
        int var2 = 0;  
        int var3 = var1[0];  
        int var4 = var1[0];  
  
        for(int var5 = 0; var5 < var1.length; ++var5) {  
            var2 += var1[var5];  
            if (var1[var5] > var3) {  
                var3 = var1[var5];  
            }  
  
            if (var1[var5] < var4) {  
                var4 = var1[var5];  
            }  
        }  
  
        double var14 = (double)var2 / (double)var1.length;  
  
        int var8;  
        int var9;  
        for(int var7 = 0; var7 < var1.length - 1; ++var7) {  
            for(var8 = 0; var8 < var1.length - 1 - var7; ++var8) {  
                if (var1[var8] > var1[var8 + 1]) {  
                    var9 = var1[var8];  
                    var1[var8] = var1[var8 + 1];  
                    var1[var8 + 1] = var9;  
                }  
            }  
        }  
    }  
}
```

```
        }

    }

}

System.out.println("----- Data Analysis Output -----");

System.out.println("Sum = " + var2);

System.out.println("Average = " + var14);

System.out.println("Maximum = " + var3);

System.out.println("Minimum = " + var4);

System.out.print("Sorted Array: ");

int[] var15 = var1;

var8 = var1.length;

int var10;

for(var9 = 0; var9 < var8; ++var9) {

    var10 = var15[var9];

    System.out.print(var10 + " ");

}

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

int[][] var16 = new int[][]{{1, 2, 3}, {4, 5, 6}};

System.out.println("2D Array Elements:");

int[][] var17 = var16;

var9 = var16.length;

for(var10 = 0; var10 < var9; ++var10) {

    int[] var11 = var17[var10];

    for(int var12 = 0; var12 < var11.length; ++var12) {

        System.out.print(var11[var12] + " ");

    }

}
```

```

        System.out.println();
    }

    try {
        System.out.println(var1[10]);
    } catch (ArrayIndexOutOfBoundsException var13) {
        System.out.println("Exception handled: Array index out of bounds");
    }

}

```

#### Q.1. Difference between Array and ArrayList

1. Array	ArrayList
2. Fixed size	Dynamic size
3. Can store primitive and objects	Stores objects only
4. Faster	Slightly slower
5. Length is fixed once created	Size can grow or shrink
6. Part of Java language	Part of Java Collection Framework

#### Q.2. How are arrays stored in memory?

Arrays are stored in continuous (contiguous) memory locations.

Each element is accessed using an index.

Index starts from 0.

Fast access because memory addresses are sequential.

Example:

```
int[] arr = {10, 20, 30};
```

#### Q.3. What causes ArrayIndexOutOfBoundsException?

It occurs when we try to access an array index less than 0 or greater than or equal to array length.

```
Example: int[] a = {1, 2, 3}; System.out.println(a[5]);
```

#### **Q.4 Explain multidimensional arrays**

A multidimensional array is an array of arrays.

Most commonly used is 2D array.

Used to store data in row and column format.

Example:

```
int[][] arr = {  
    {1, 2, 3},  
    {4, 5, 6}  
};
```

#### **Q.5 When not to use arrays?**

When array size changes frequently

When insertion and deletion operations are required often

When dynamic memory is needed

When advanced data manipulation is required

The screenshot shows the Visual Studio Code interface with several tabs at the top: EXPLORER, PROBLEMS (selected), OUTPUT, DEBUG CONSOLE, TERMINAL, PORTS, SPELL CHECKER, and others. The Problems tab displays a list of warnings from the build process:

```
c:\Users\madha\OneDrive\Desktop\sanika>javac arraydataanalysis.java
[0.021s][warning][cds] A jar file is not the one used while building the shared archive file: C:\Users\madha\AppData\Roaming\Code\User\globalStorage\pleiades.java-extension-pack-jdk\java\21\lib\modules
[0.021s][warning][cds] A jar file is not the one used while building the shared archive file: C:\Users\madha\AppData\Roaming\Code\User\globalStorage\pleiades.java-extension-pack-jdk\java\21\lib\modules
[0.022s][warning][cds] C:\Users\madha\AppData\Roaming\Code\User\globalStorage\pleiades.java-extension-pack-jdk\java\21\lib\modules timestamp has changed.

c:\Users\madha\OneDrive\Desktop\sanika>java ArrayDataAnalysis
[0.021s][warning][cds] A jar file is not the one used while building the shared archive file: C:\Users\madha\AppData\Roaming\Code\User\globalStorage\pleiades.java-extension-pack-jdk\java\21\lib\modules
[0.022s][warning][cds] A jar file is not the one used while building the shared archive file: C:\Users\madha\AppData\Roaming\Code\User\globalStorage\pleiades.java-extension-pack-jdk\java\21\lib\modules
[0.022s][warning][cds] C:\Users\madha\AppData\Roaming\Code\User\globalStorage\pleiades.java-extension-pack-jdk\java\21\lib\modules timestamp has changed.
----- Data Analysis Output -----
Sum = 281
Average = 46.833333333333336
Maximum = 89
Minimum = 12
Sorted Array: 12 23 34 45 78 89

2D Array Elements:
1 2 3
4 5 6
Exception handled: Array index out of bounds
```

The Explorer sidebar on the left lists files and folders under the SANIKA project, including .vscode, ArrayDataAnalysis.class, ArrayDataAnalysis.java, calculator.class, calculator.java, Hellow, HelloWorld.class, HelloWorld.java, modularcalculator.class, modularcalculator.java, sanika.py, sanikad.py, sorting.py, StudentResultSystem.c..., and StudentResultSystem.j... The bottom of the terminal window shows the current working directory as c:\Users\madha\OneDrive\Desktop\sanika>.