

 **DAY 8 – One Dimensional Arrays (1D Arrays)**

Class Programs → 4

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★ 1. What is an Array?

An array is a collection of multiple values of the same datatype, stored in continuous memory locations, accessed using an index.

Example:

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

Key Points

Array index starts from 0

arr[0] → 10

arr[1] → 20

★ 2. Why Arrays?

Without array:

```
int a, b, c, d, e;
```

With array:

```
int arr[ ] = new int[5];
```

☞ Useful when we need to store many values using one variable name.

★ 3. Types of Array Declaration

Method 1

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

Method 2

```
int arr[] = new int[5];
arr[0] = 10;
arr[1] = 20;
...
---
```

★ ★ CLASS PROGRAM – 1

Program: Read and print 5 elements of an array

Pseudo Code

```
Start
Create array of size 5
Repeat i from 0 to 4:
    Read arr[i]
Repeat i from 0 to 4:
    Print arr[i]
End
```

Flow

1. Create array

2. Read 5 inputs

3. Print all values

Variables Used

arr[] → stores 5 integers

i → loop counter

Program

```
import java.util.Scanner;

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

        Scanner sc = new Scanner(System.in);

        int arr[] = new int[5];

        System.out.println("Enter 5 numbers:");

        for (int i = 0; i < 5; i++) {
            arr[i] = sc.nextInt();
        }

        System.out.println("Array elements are:");

        for (int i = 0; i < 5; i++) {
            System.out.println(arr[i]);
        }
    }
}
```

Output

(Example)

Enter 5 numbers:

10 20 30 40 50

Array elements are:

10
20
30
40
50

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★ ★ CLASS PROGRAM – 2

Program: Find sum of array elements

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Pseudo Code

Start
Create array arr
sum = 0
Loop i from 0 to n-1:
 sum = sum + arr[i]
Print sum
End

Flow

Add all values of the array

Print total

Variables Used

arr[] → input values

sum → stores total

i → loop counter

Program

```
class ArraySum {  
    public static void main(String args[]) {  
  
        int arr[] = {10, 20, 30, 40, 50};  
        int sum = 0;  
  
        for (int i = 0; i < arr.length; i++) {  
            sum += arr[i];  
        }  
  
        System.out.println("Sum = " + sum);  
    }  
}
```

Output

Sum = 150

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★ ★ CLASS PROGRAM – 3

Program: Find largest element in an array

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Pseudo Code

Start

max = arr[0]

Loop i from 1 to n-1:

 If arr[i] > max:

 max = arr[i]

Print max

End

Flow

Start max as first element

Compare with all remaining

Update largest value

Variables Used

arr[] → values

max → stores largest number

i → traversal

Program

```
class LargestInArray {  
    public static void main(String args[]) {  
  
        int arr[] = {40, 10, 90, 30, 60};  
        int max = arr[0];  
  
        for (int i = 1; i < arr.length; i++) {  
            if (arr[i] > max)  
                max = arr[i];  
        }  
  
        System.out.println("Largest = " + max);  
    }  
}
```

Output

Largest = 90

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★ ★ CLASS PROGRAM – 4

Program: Search for an element in an array

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Pseudo Code

Start
Take key value
Loop i:
 If arr[i] == key:
 Print found
 Stop
 Print not found
End

Flow

Accept element to find

Check each index

If match found → print location

Variables Used

arr[] → data

key → value to search

i → iterator

Program

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

```
int arr[] = {5, 10, 15, 20, 25};  
int key = 15;  
boolean found = false;  
  
for (int i = 0; i < arr.length; i++) {  
    if (arr[i] == key) {  
        System.out.println("Found at index " + i);  
        found = true;  
        break;  
    }  
}  
  
if (!found)  
    System.out.println("Not Found");  
}  
}
```

Output

Found at index 2

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★ ★ ★ ASSIGNMENT PROGRAMS – 4

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★ Assignment – 1

Program: Count even numbers in an array

```
class CountEven {  
    public static void main(String args[]) {  
  
        int arr[] = {10, 21, 32, 43, 54};  
        int count = 0;  
  
        for (int i = 0; i < arr.length; i++) {  
            if (arr[i] % 2 == 0)  
                count++;  
        }  
    }  
}
```

```
    }  
  
    System.out.println("Even Count = " + count);  
}  
}  
  
Output
```

Even Count = 3

★ Assignment – 2

Program: Count odd numbers in an array

```
class CountOdd {  
    public static void main(String args[]) {  
  
        int arr[] = {12, 17, 23, 44, 55};  
        int count = 0;  
  
        for (int i = 0; i < arr.length; i++) {  
            if (arr[i] % 2 != 0)  
                count++;  
        }  
  
        System.out.println("Odd Count = " + count);  
    }  
}
```

Output

Odd Count = 3

★ Assignment – 3

Program: Find smallest element in an array

```
class SmallestInArray {
```

```
public static void main(String args[]) {  
  
    int arr[] = {25, 5, 15, 40, 8};  
    int min = arr[0];  
  
    for (int i = 1; i < arr.length; i++) {  
        if (arr[i] < min)  
            min = arr[i];  
    }  
  
    System.out.println("Smallest = " + min);  
}  
}
```

Output

Smallest = 5

★ Assignment – 4

Program: Calculate average of array elements

```
class ArrayAverage {  
    public static void main(String args[]) {  
  
        int arr[] = {10, 20, 30, 40, 50};  
        int sum = 0;  
  
        for (int i = 0; i < arr.length; i++) {  
            sum += arr[i];  
        }  
  
        double avg = sum / (double) arr.length;  
  
        System.out.println("Average = " + avg);  
    }  
}
```

Output

Average = 30.0