What is an Array?

An **array** is a data structure in Java used to store **multiple values** of the **same data type** in a single variable.

Key Features:

- Fixed size (once created, size cannot change).
- Indexed (index starts from 0).
- Stores elements of the same type.

Declaration of an Array

```
datatype[] arrayName;    // Preferred syntax
// or
datatype arrayName[];
```
Example:
```
int[] numbers;
```

Instantiation of an Array

```
arrayName = new datatype[size];
```

Example:

```
numbers = new int[5]; // creates an array of 5 integers
```

Declaration + Instantiation + Initialization

```
int[] numbers = new int[5]; // default values are 0
```

Or:

```
int[] numbers = {10, 20, 30, 40, 50}; // direct initialization
```

Accessing Array Elements

```
System.out.println(numbers[0]); // prints the first element
```

Array Length

```
int len = numbers.length;
System.out.println("Length: " + len);
```