EXCELR
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Java FullStack

Title: Control Statements and Arrays in Java

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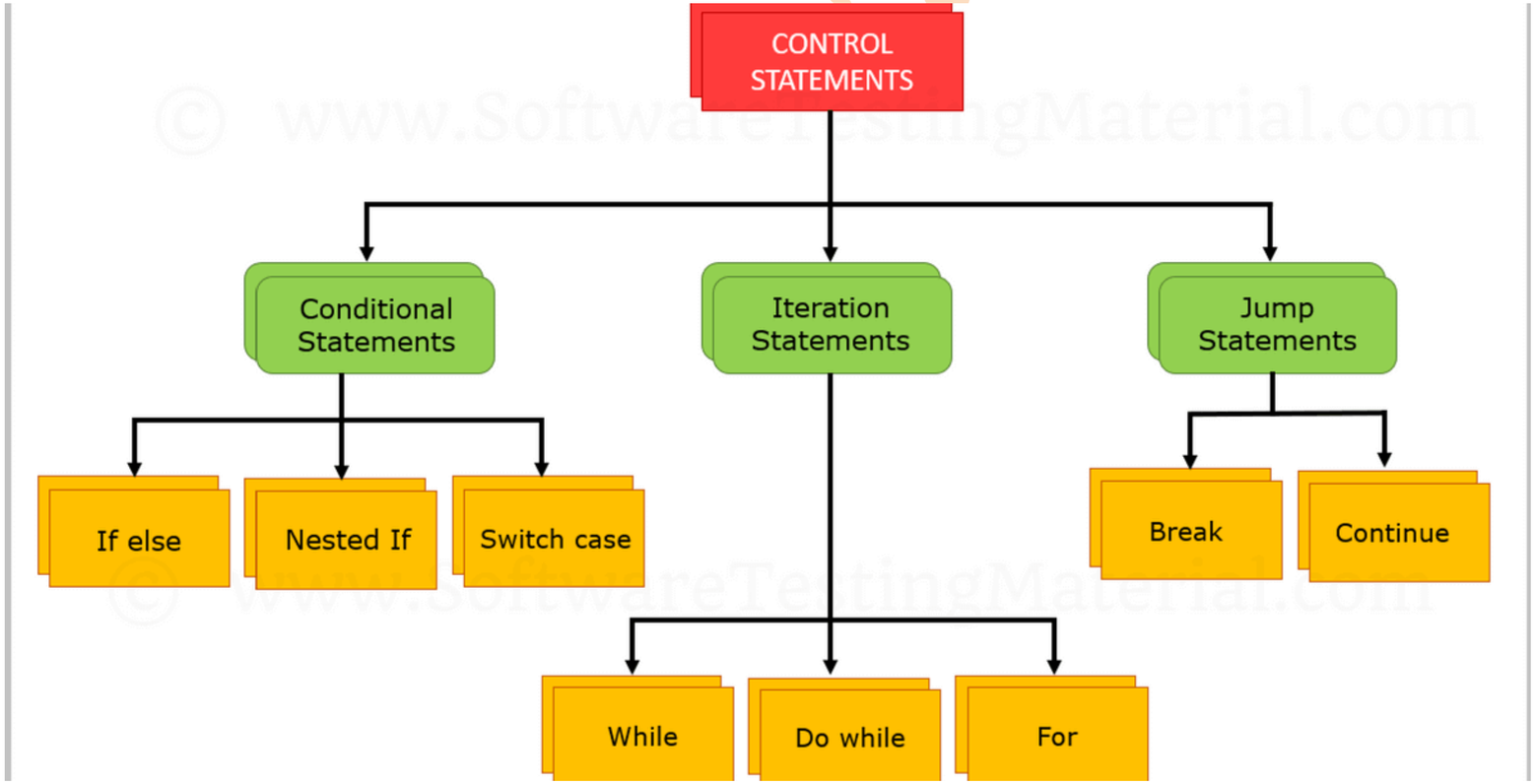
Introduction

- Welcome to our presentation on Control Statements and Arrays in Java. These two fundamental concepts are the building blocks of Java programming, allowing developers to create powerful, dynamic, and efficient applications."
- "Control statements in java are an essential part of any programming language and are used to control the flow of a program. They determine what action the program should take and what code should be executed based on certain conditions.
- "Arrays, on the other hand, are essential for handling collections of data. They enable you to store, retrieve, and manipulate multiple values efficiently. Arrays are at the heart of data management in Java."

Control Statements

The control statements help users specify the order of execution of the instructions present in a program. These make it possible for the program to make certain decisions, perform various tasks repeatedly, or even jump from any one section of the code to a different section.



Conditional Statements

- Use if to specify a block of code to be executed, if a specified condition is true
- Use else to specify a block of code to be executed, if the same condition is false
- Use else if to specify a new condition to test, if the first condition is false
- Use switch to specify many alternative blocks of code to be executed

If-else

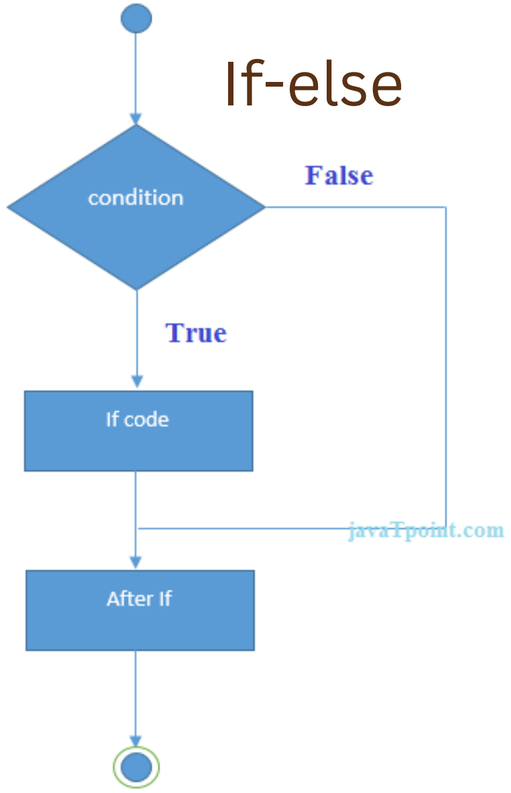
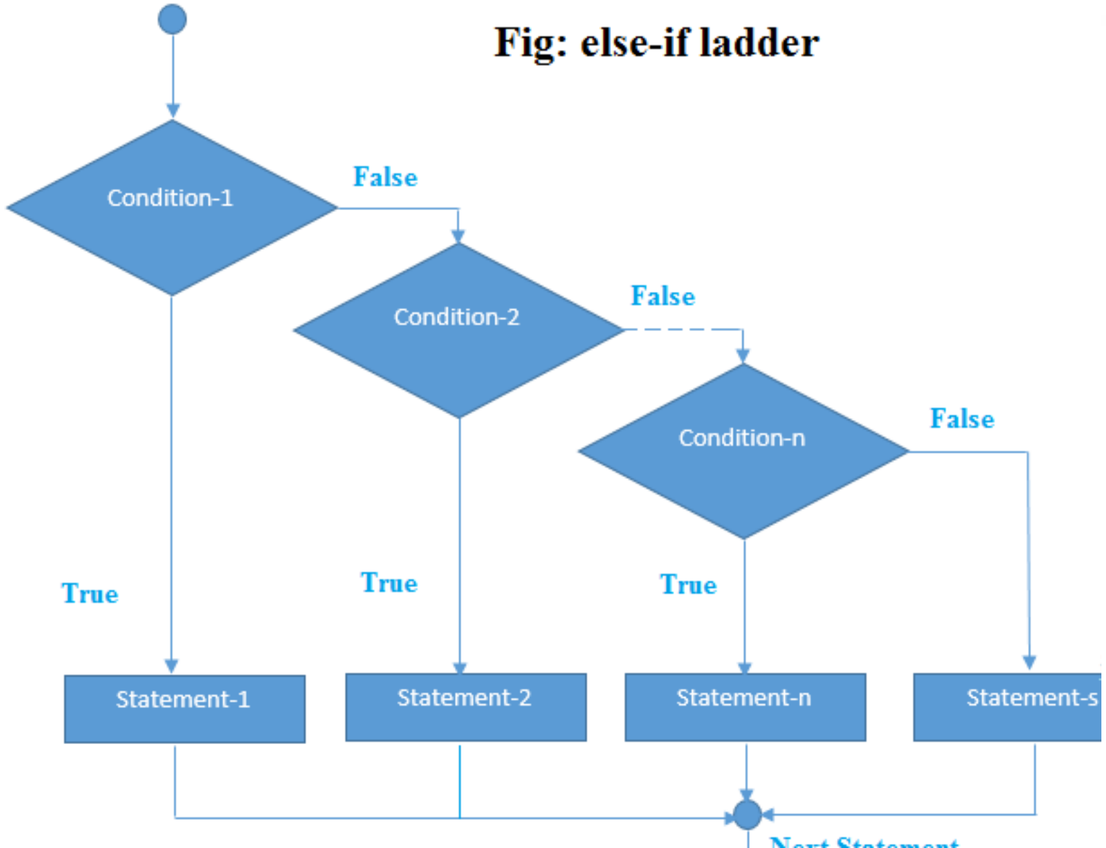
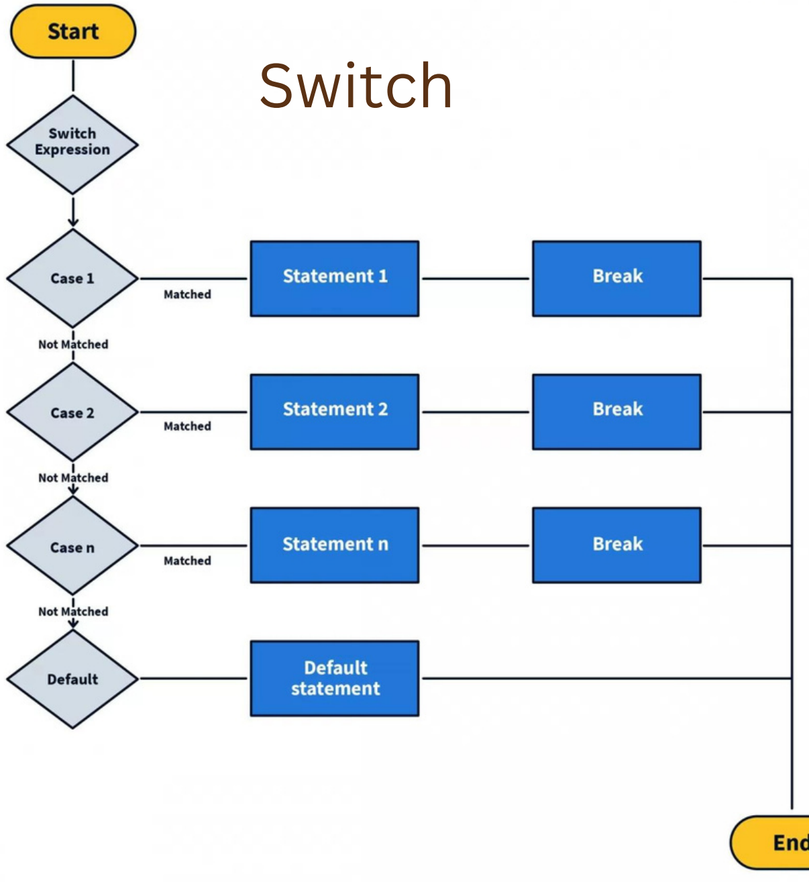


Fig: else-if ladder

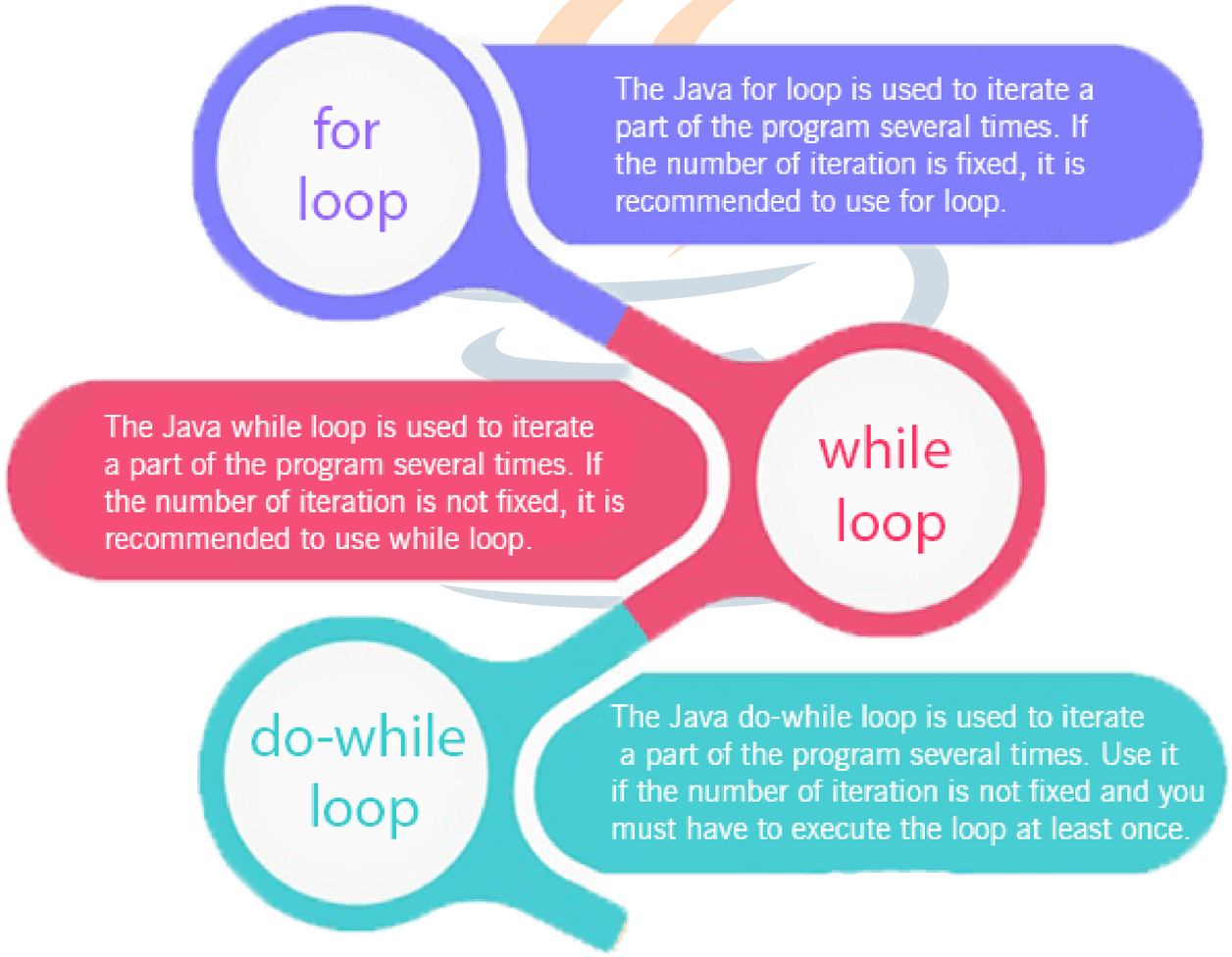


Switch



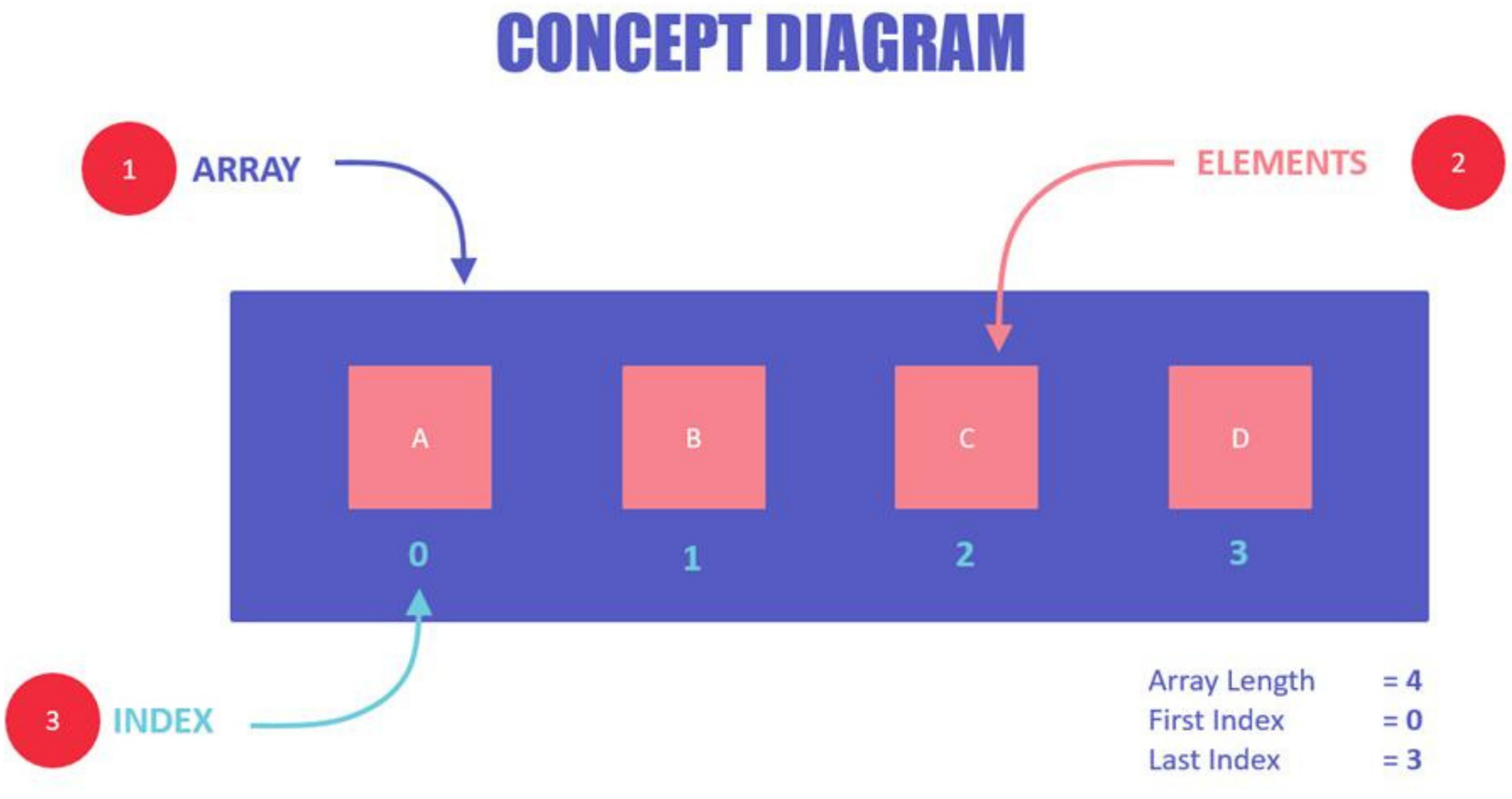
Looping Statements

Looping in programming languages is a feature which facilitates the execution of a set of instructions/functions repeatedly while some condition evaluates to true.



Arrays

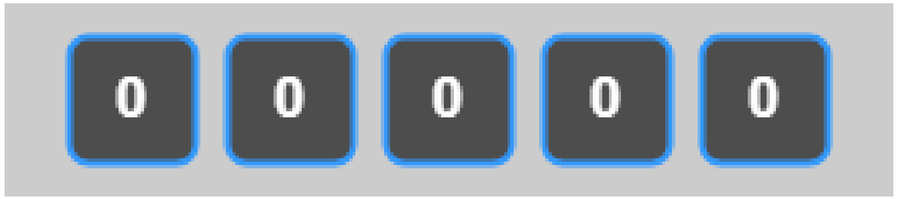
- Arrays are used to store multiple values in a single variable, instead of declaring separate variables for each value.
- To declare an array, define the variable type with square brackets:



Declaring and Initializing

- A Java array variable can also be declared like other variables with [] after the data type.
- The variables in the array are ordered, and each has an index beginning with 0.

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

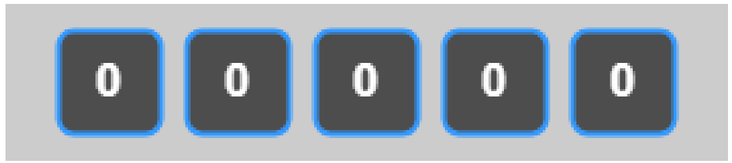



```
int arr[] = {42, 51, 63, 90, 87};
```

Accessing Elements

- A Java array variable can also be declared like other variables with [] after the data type.
- The variables in the array are ordered, and each has an index beginning with 0.

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



Each array element is accessed by its numerical index:

```
int arr[] = {42, 51, 63, 90, 87};
```

arr[**Index_number**]

Modification & Iteration

Loop Through an Array

- You can loop through the array elements with the for loop, and use the length property to specify how many times the loop should run.

Example **for loop**

```
String[] cars = {"Volvo", "BMW", "Ford", "Mazda"};
for (int i = 0; i < cars.length; i++) {
  System.out.println(cars[i]);
}
```

The example above can be read like this:

- iteration over index of the Array till its **length -1**
- because Array index start from **0**

Example **for Each**

```
String[] cars = {"Volvo", "BMW", "Ford", "Mazda"};
for (String i : cars) {
  System.out.println(i);
}
```

The example above can be read like this:

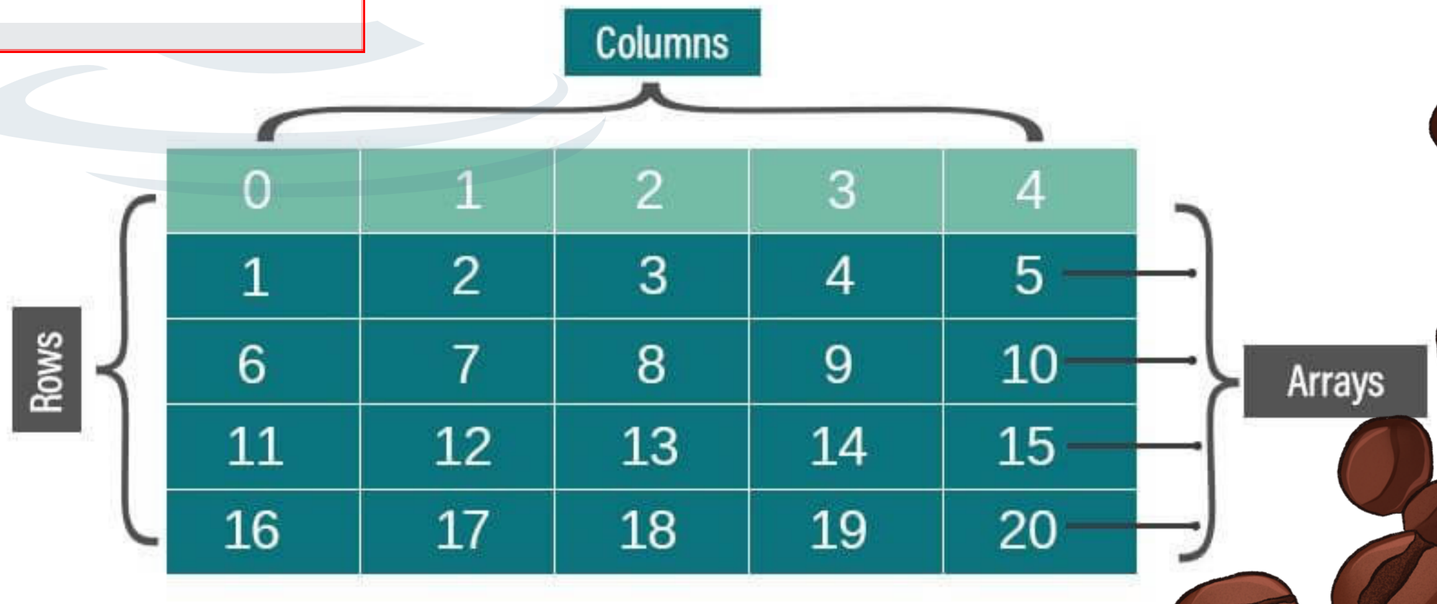
- for each String element (called **i - as in index**) in cars, print out the value of i.

Multidimentional Array

- A multidimensional array is an array of arrays.
- Multidimensional arrays are useful when you want to store data as a tabular form, like a table with rows and columns.
- To create a two-dimensional array, add each array within its own set of **curly braces**

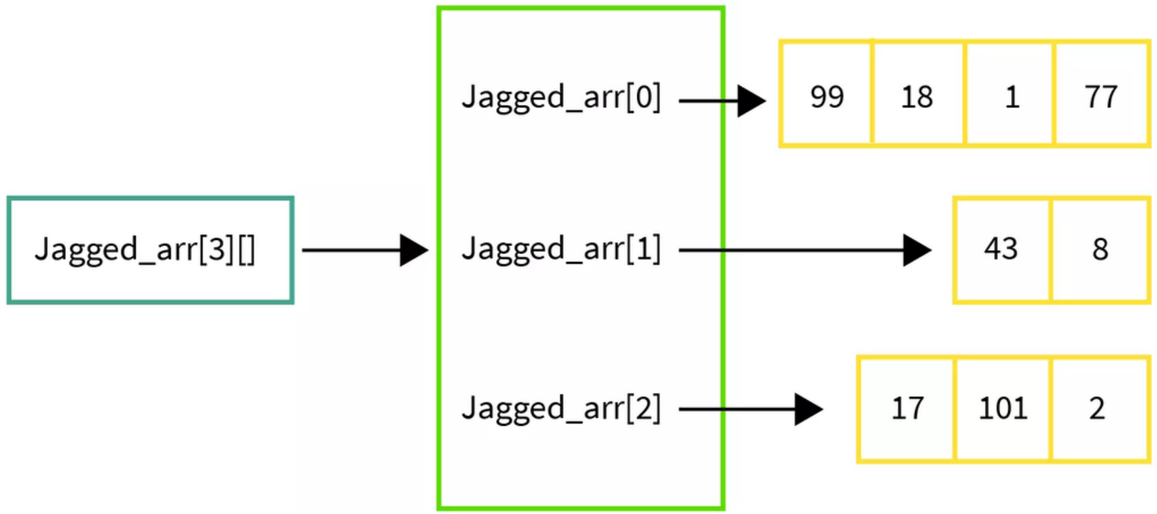
Example

```
int[][] myNumbers = { {1, 2, 3, 4}, {5, 6, 7} };
```



Jagged Array

A jagged array is an array of arrays such that member arrays can be of different sizes




```
// Displaying the values of 2D Jagged array
System.out.println("Contents of 2D Jagged Array");
for (int i = 0; i < arr.length; i++) {
    for (int j = 0; j < arr[i].length; j++)
        System.out.print(arr[i][j] + " ");
    System.out.println();
}
```

Conclusion

Here's a summary of the key points about control statements and arrays in Java, along with the reinforcement of their importance in Java programming:

Control Statements in Java:

1. **Purpose:** Control statements in Java are essential for making decisions and controlling the flow of a program.
2. **Importance:** They enable developers to create dynamic and adaptive applications by allowing the execution of specific code based on logical conditions or user input.

Arrays in Java:

1. **Purpose:** Arrays are fundamental data structures used for storing collections of values in Java.
2. **Importance:** They enable efficient data management by allowing you to store, access, and manipulate multiple values under a single variable.

Thank You !