What is Java?

Java Programming is a high-
level programming language created by sun microsystems. This programming languag
e is reliable, object-
oriented and secure. Java follows the WORA principle, which stands for "Write Once
Run Anywhere". You can run a java program as many times as you want on a java su
pported platform after it is compiled.

What are Data Structures?

A data structure is defined as a format for arranging, processing, accessing, and storin
g data. Data structures are the combination of both simple and complex forms, all of
which are made to organise data for a certain use. Users find it simple to access the da
ta they need and use it appropriately thanks to data structures.

To make you understand in simpler terms, look at the below example

```
If you want to store data in


One on the other - Stacks

Linear fashion - Array/ Linked List

Hierarchical Fashion - Trees

Connect Nodes - Graph
```

What are Data Structures in Java?

Data Structure in java is defined as the collection of data pieces that offers an effective means of storing and organising data in a computer. Linked List, Stack, Queue, and arrays are a few examples of java data structures.

Types of Data Structures in Java

Here is the list of some of the common types of data structures in Java:

- Array
- Linked List
- Stack
- Queue
- Binary Tree
- Binary Search Tree
- Heap
- Hashing
- Graph

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Here is the pictorial representation of types of java data structures

Further classification of types of Data Structures

There are two types of Data Structures:-

1. Primitive Data Structures
2. Non-primitive Data Structures

Primitive data Structures are also called Primitive Data Types. byte, short, int, float , char, boolean, long, and double are primitive Data types.

Non-primitive data Structures – Non-primitive Data Structures are of two types:-

1. Linear Data Structures
2. Non-linear Data Structures

Linear Data Structures –

The elements arranged in a linear fashion are called Linear Data Structures. Here, each element is connected to one other element only. Linear Data Structures are as follows:

- **Arrays**
  - o Single dimensional Array
  - o Multidimensional Array

- **Stack**
- **Queue**

- **Linked List**
  - o Singly-linked list
  - o Doubly Linked list
  - o Circular Linked List

Non-Linear Data Structures – The elements arranged in a non-linear fashion are called Non-Linear Data Structures. Here, each element is connected to n-other elements. Non-Linear Data Structures are as follows:

- **Trees**
  - o Binary Tree
  - o Binary Search Tree
  - o AVL Tree

- o Red-Black Tree

- **Graph**

- **Heap**
  - o MaxHeap
  - o MinHeap

- **Hash**
  - o HashSet
  - o HashMap

Advantages of Data Structures in java

- Efficiency
- Reusability
- Processing Speed
- Abstraction
- Data Searching

Classification of Data Structures

Data Structures can be classified as:-

- **Static Data Structures** are the Data structures whose size is declared and fixed at Compile Time and cannot be changed later are called Static Data structures.
- **Example – Arrays**
- **Dynamic Data Structures** are the Data Structures whose size is not fixed at compile time and can be decided at runtime depending upon requirements are called Dynamic Data structures.
- **Example – Binary Search Tree**