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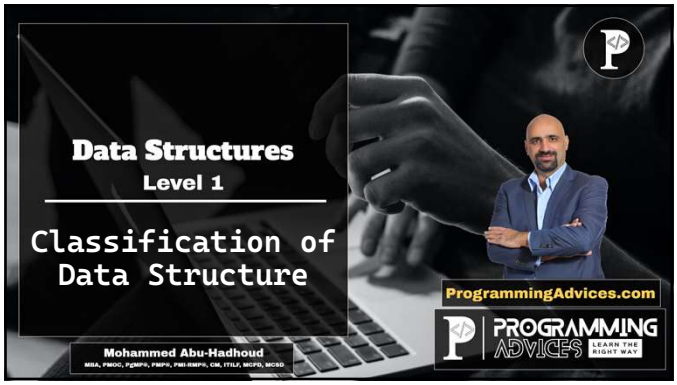
Data Structures
Level 1
Classification of Data Structure
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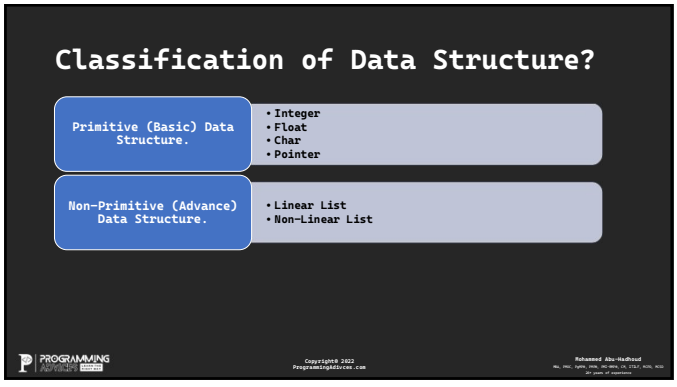
Classification of Data Structure?
Primitive (Basic) Data Structure.
• Integer
• Float
• Char
• Pointer
Non-Primitive (Advance) Data Structure.
• Linear List
• Non-Linear List
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## Differences:

| | |
|---|---|
| A primitive data structure: | • Is generally a basic structure that is usually built into the language, such as an integer, a float. |
| A non-primitive data structure: | • Is built out of primitive data structures linked together in meaningful ways, such as a or a arrays, linked-list, binary search tree, Tree, graph etc. |

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## Primitive Data Structure:

| | |
|---|---|
| Primitive Data Structure. | • Integer<br>• Float<br>• Char<br>• Pointer |

- They are basic structures and directly operated upon the machine instructions.
- Integer, Float, Char, pointers..etc., fall in this category.

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## Non-Primitive Data Structure:

| | |
|---|---|
| Linear List | • Array<br>• Linked List<br>• Stack<br>• Queue |
| Non-Linear List | • Tree<br>• Graph |

- Complex/Sophisticated Data Structure derived from primitive data structure.
- Emphasize on structuring of group of homogeneous (same type) or heterogeneous (different type) data items.
- The design of an efficient data structure must take operations to be performed on data structure.

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## Linear vs Non-Linear Data Structures

**Linear Data Structure**

- Data structure in which data elements are arranged sequentially or linearly, where each element is attached to its previous and next adjacent elements, is called a linear data structure.
- Examples of linear data structures are array, stack, queue, linked list, etc.

**Non-Linear Data Structure**

- Data structures where data elements are not placed sequentially or linearly are called non-linear data structures. In a non-linear data structure, we can't traverse all the elements in a single run only.
- Examples of this data structure are Tree, Graph, etc.

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## Static vs Non-Static Data Structures

**Static data structure**

- Static data structure has a fixed memory size. It is easier to access the elements in a static data structure.
- An example of this data structure is an array.

**Dynamic data structure**

- In dynamic data structure, the size is not fixed. It can be randomly updated during the runtime which may be considered efficient concerning the memory (space) complexity of the code.
- Examples of this data structure are Stack , Queue, etc.

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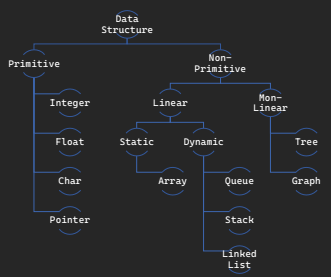
## Classifications of Data Structure:

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## Common Operations on Data Structure:

**Operations On Data**

- Create
- Update
- Search
- Select
- Sorting
- Merging
- Destroy or Delete

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