



Fundamentals of
Data Structures using C

Introduction to Data Structures

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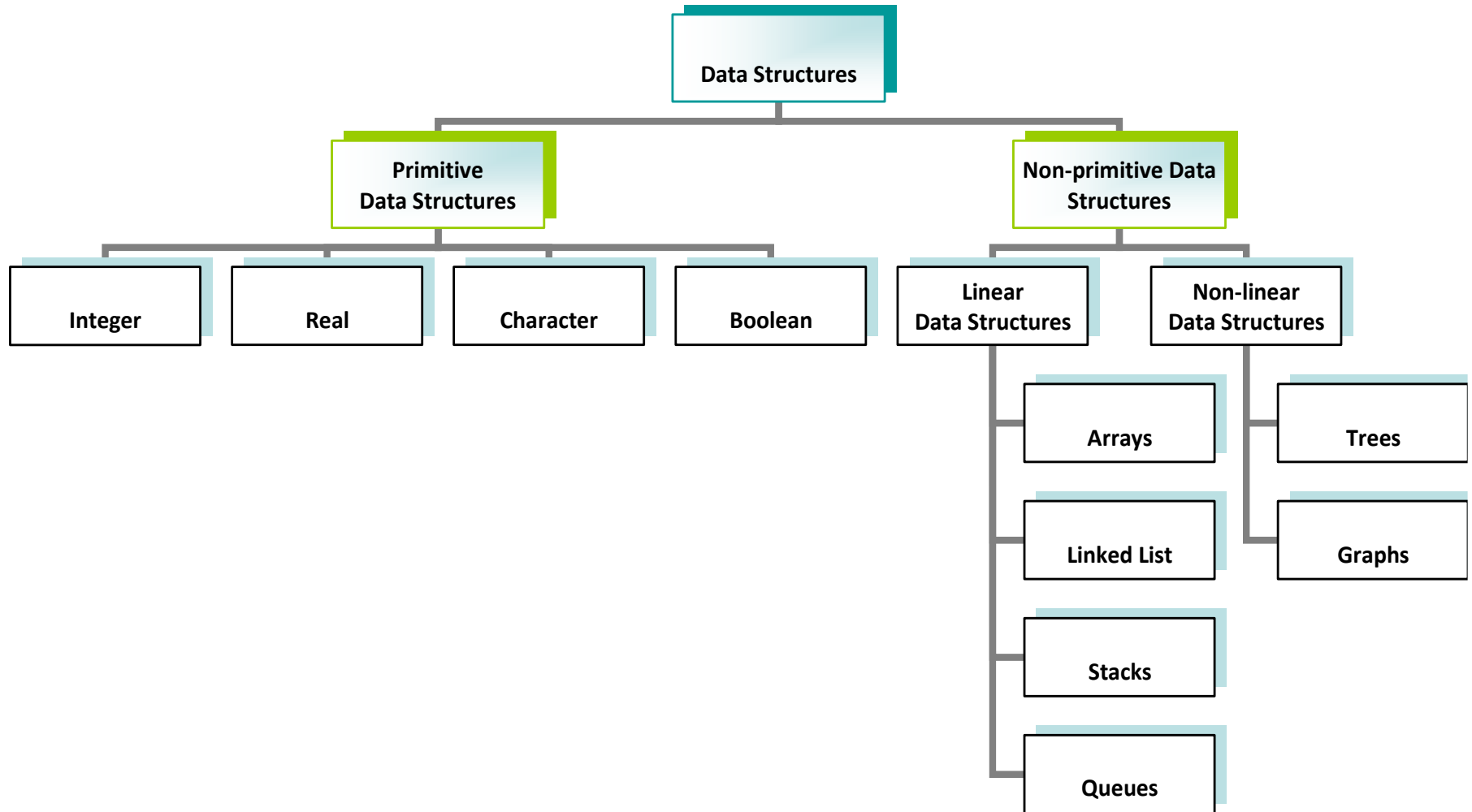
Introduction

- Data structure is the way of organizing and storing data in a computer system so that it can be used efficiently.

Applications of Data Structures

- Compiler design
- Operating system
- Database management system
- Statistical analysis package
- Numerical analysis
- Graphics
- Artificial intelligence
- Simulation

Classification of Data Structure



Classification of Data Structure

- Primitive
- Non-primitive

Primitive Data Structures

- Primitive data structures include all the fundamental data structures that can be directly manipulated by machine level instructions.
- Some of the common primitive data structures include:
 - Integer
 - Character
 - Real
 - Boolean, etc.

Non-primitive Data Structures

- Non-primitive data structures refer to all those data structures that are derived from one or more primitive data structures.
- The objective of creating non-primitive data structures is to form sets of homogeneous or heterogeneous data elements.
- Non-primitive data structures are further categorized into two types:
 - Linear
 - Non-linear

Linear Data Structures

- In linear data structures, all the data elements are arranged in a linear or sequential fashion.
- Examples of linear data structures include:
 - Arrays
 - Stacks
 - Queues
 - Linked lists, etc.

Non-linear Data Structures

- In non-linear data structures, there is no definite order or sequence in which data elements are arranged.
- For instance, a non-linear data structure could arrange data elements in a hierarchical fashion.
- Examples of non-linear data structures are:
 - Trees
 - Graphs

Abstract Data Type (ADT)

- An abstract data type (ADT) is a set of objects together with a set of operations.
- Abstract data types are mathematical abstractions.
- Objects such as lists, sets, and graphs, along with their operations, can be viewed as abstract data types.

Queries?

Thank You!