

DS introduction

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A **data structure** is a special way of organizing and storing data in a computer so that it can be used efficiently. Array, LinkedList, Stack, Queue, Tree, Graph etc are all data structures that store the data in a special way so that we can **access and use the data efficiently**. Each of these mentioned **data structures** has a different special way of organizing data so we choose the data structure based on the requirement, we will cover each of these data structures in a separate tutorial.

Data Structure Types

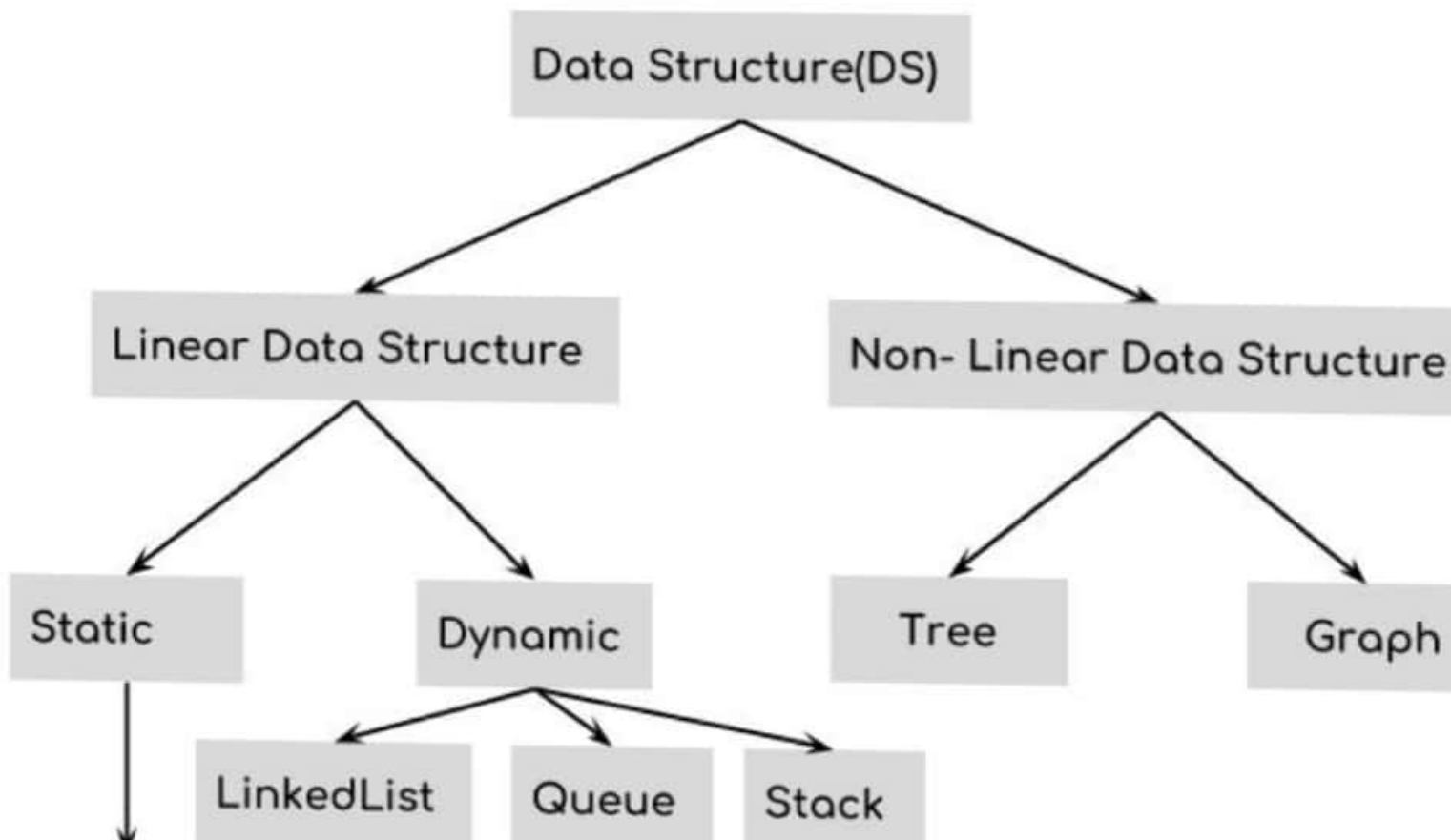
We have two types of data structures:

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

Linear data structures: Elements of Linear data structure are accessed in a sequential manner, however the elements can be stored in these data structure in any order. Examples of linear data structure are: LinkedList, Stack, Queue and Array

Non-linear data structures: Elements of non-linear data structures are stores and accessed in non-linear order. Examples of non-linear data structures are: Tree and Graph

Classification of Data Structure with Diagram



Why we need data structures? – Advantages of DS

We need data structures because there are several advantages of using them, few of them are as follows:

1. **Data Organization:** We need a proper way of organizing the data so that it can be accessed efficiently when we need that particular data. DS provides different ways of data organization so we have options to store the data in different data structures based on the requirement.
2. **Efficiency:** The main reason we organize the data is to improve the efficiency. We can store the data in arrays then why do we need linked lists and other data structures? because when we need to perform several operations such as add, delete, update and search on arrays, it takes more time in arrays than some of the other data structures. So the fact that we are interested in other data structures is because of the efficiency.