The Concept Of;
# Hashing , Hash tables and Trees in computer science.

Introductions

Hashing;

- It refers to the process of transforming a given key or a string of characters into another value.

- In computer science ,strings of value are converted into a shorter ,fixed length value or key that can be used to quickly lookup or identify the original string .

Hash tables ;

- It is a data structure that uses hash functions to map data to an array of any type including number, strings and objects.

- Hash tables are commonly used in computer programming to implement efficient data lookup and have a number of advantages over other structures such as faster access time and better space utilization.
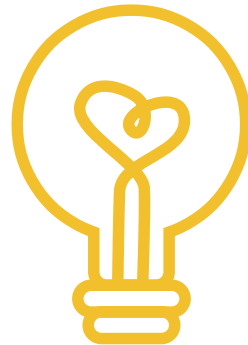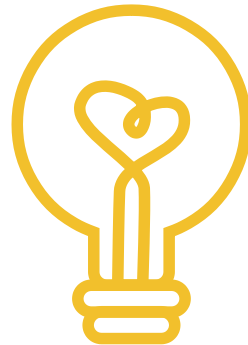
Aspects to note about Hashing.

- Basically hashing makes use of hash function which is any mathematical function that is use to map data of arbitrary size to fixed size value.

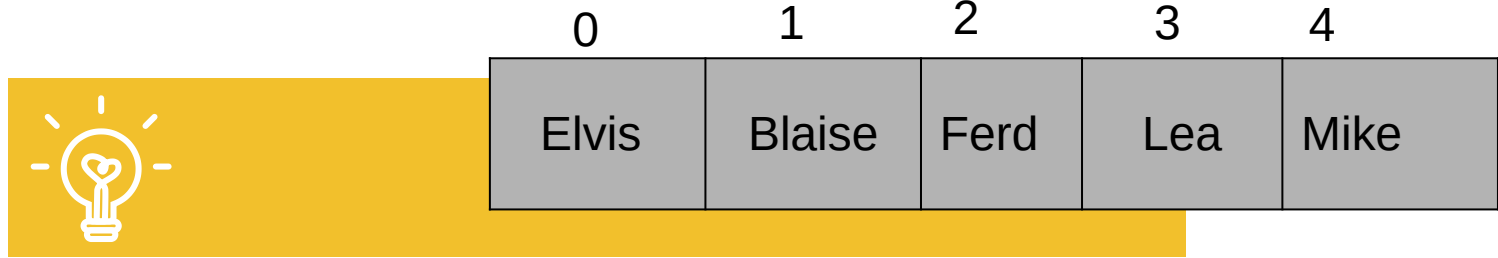- Hashing is used in a variety of applications, including data storage,security and data compression.

Diagram representation of hashing and hash tables;

Hash function diagram.

Key;   Names

Value;   Phone#

	0	1	2	3	4
	Elvis	Blaise	Ferd	Lea	Mike

Hash(key) ⟶ index

Hash(mike) ⟶ 4
Hash(Elvis) ⟶ 0
Hash(Blaise) ⟶ 1
Hash(Lea) ⟶ 3

Trees and graphs in computer science

Trees

- A tree is a collection of entities called nodes. These node are connected by edges that may or may not have a child node The first node of a tree is called a root.

Types of trees

- There are basically 4 types of trees which are ;

1-Binary tree
2-Binary search tree
3-AVL tree
4-B tree

01 Binary tree

This is a types of tree data structure where every parent node have a maximum of two children. As the name suggest binary means two ,therefore each node can have 0,1, or 2 nodes.

02 Binary search tree

These types of tree structure are none-linear and one node is connected to a number of nodes. The node can be connected to at most two child node. Each node has a maximum of two children .

03 AVL tree

The AVL tree are the types or variants of a binary tree. It consist of the properties from both the binary as well as the binary search tree . These trees are self balancing which means the height of the left sub tree and right sub tree are balanced.
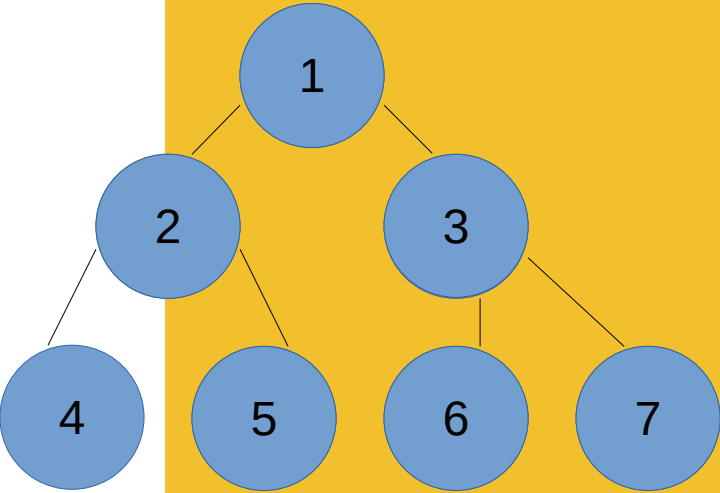
04 B-tree

These trees are a more generalized form of a binary search tree. It is also known as the height balanced m way tree ,where m is the order of the tree. Each node of the tree can have more than one key and more than two children node.
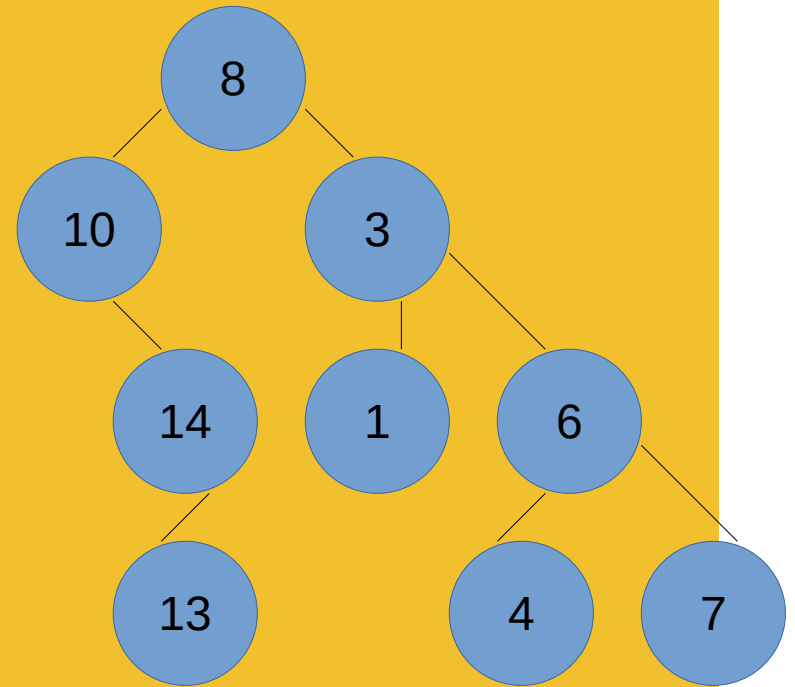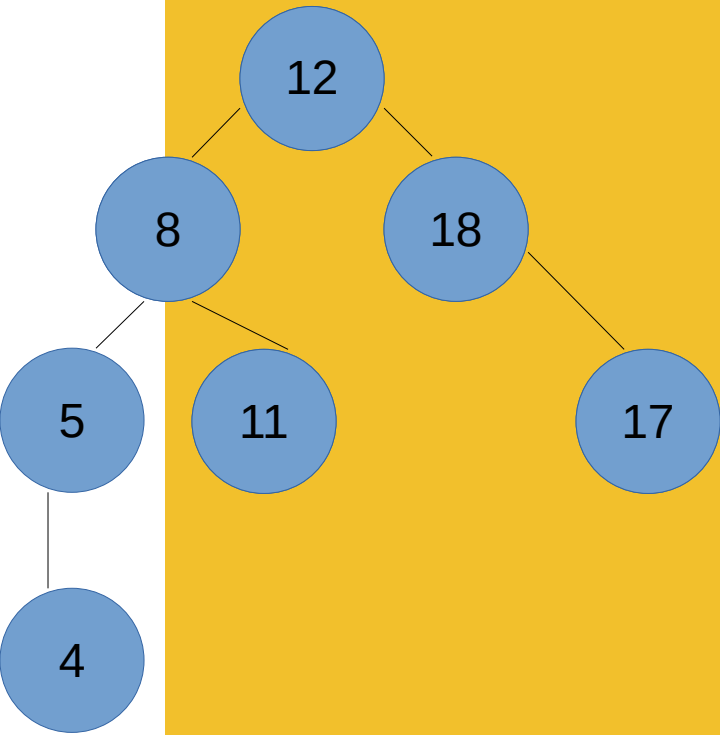
Diagrams

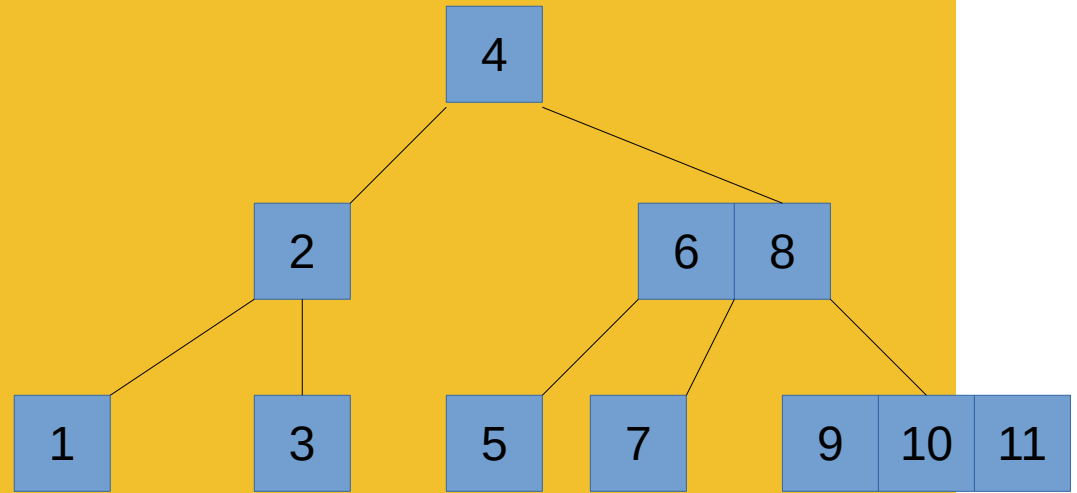Illustrations

Binary tree

Binary Search tree

Diagrams
Illustrations

AVL trees

B-tree

THANK YOU

Group Members

Chatto Elvis
Alabe Ferdinand
Angui Blaise