**Day 3 :**

**22 June – 2024**

**Data Structure**

Data structure is a way of collecting and Organising data in a such way that we can perform some operation like add, delete, update, retrieve, sort, search in an efficient ways.

Example

Employee Person Product Order Customer

Name, age, result, marks etc.

JavaScript

var a=10;

let a

const a;

data types : it is type of data which tells that type of data it can hold.

int a=10;

data types of divided into two types.

1. Primitive data types

It is use to store only one value

number, int, float, char, string, boolean, decimal etc.

1. Non primitive data type or reference data types

It is use to store more than one value

array, structure , class, interface, enum : user defined data types.

Pre defined reference data types

Lists

Linear list types : stack, queue etc

Non linear list type : Tree and Graph

Algorithms : An algorithms is a finite set of instruction or logic. Using algorithm we can perform some specific task.

Algorithms is not a complete program or code. It is a just the core logic or solution of that problem.

Program : set of instruction to perform a specific task.

Input

Process logic

Output

Start

Read a,b,

Compute sum = a+b

Write sum

Stop

1. Time complicitly
2. Constant time : as the input size increase, the time taken to the perform some operation remains same. O(1)
3. Linear time : as the input size (n) increase. The time taken to perform the operation increase linearly. O(n)
4. Logarithm time : as the input size (n) increase. The time taken to perform the operation increase logarithmically. O(log n)
5. Quadratic time : as the input size (n) increase. The time taken to perform the operation increase quadratically. O(n^2)
6. Space complicitly
7. Contant space
8. Linear space
9. Logarithm space
10. Quadrict space

Client side JavaScript : the script which we run on browser with help of html is known as client side JavaScript.

Node JS : Before node js JavaScript known as client side scripting language. But after node js JavaScript also known as client side as well as server side.

Node Js provided lot of pre defined module which help to do sever side programming code.

In node js we can use same code as JavaScript except no dom or bom.

Server Side JavaScript

Reference data types

1. array : array is one of the type of reference data type which is use to store more than one value of same type(static data type like C, C++ or Java or TypeScript). But the language support dynamic data type array can store same type or different types (JavaScript or Python) etc.

array use index position to store the value start from 0.

Array is known as fixed sized memory (Java, C or C++). But in JavaScript array by default known as dynamic memory reference types.

Whenever we created array it use index position and those value store in sequentially.

Using index position we can access the value in array.

100,200,300,400,500

100,200,1111,300,400,500

1. Linked list : it is a type of linear data structure which help to store data or value the using node concept. In linked list we can travels from one node to another node using pointer or reference of another.

Value ref(10) -🡪 null 20 ref 30 ref --null

Pref value(10) nref

Types of linked list

1. Single linked list
2. Double linked list
3. Circular single linked list
4. Circular double linked list

Node itself is null