**Day 1 : 8 February 2025**

**Data Structure**

Data structure is a way of organize and storing the data so the it can be accessed and manipulate in efficient way.

Data : it can be number format, string format, Boolean, array format, object format or array of object format.

Whenever we want to deal with data

1. Time complicity
2. Space or memory.

Axios.get(“URL”)

let emp = {id:100,name:”Steven”,age:21}; literal style object.

let empJson = {“id”:101,”name”:”Steven”,age:23}; JSON

The data structure mainly divided into two types.

1. Primitive data structure
   1. It is use to store only value of any types
2. Non primitive data structure or reference data types.
   1. It can hold value as well as reference of another data types.

Primitive data types.

1. Number : with or without decimal point.
2. String :
3. Boolean
4. Undefined

Before Node JS, JavaScript was known as client side scripting language. But after node JS JavaScript also known as server side scripting language. With help of client side scripting language we can develop only frontend side technology and to run Client side JS we need browser environment

Limitation of Client Side scripting language.

1. With help of CSJS we can’t interact with database or file system.
2. With help of CSJS we can’t develop rest api.
3. With help of CJS we can’t create server side program.

HTML, CSS, JS or React JS 🡨-----------------------------------------------🡪 Server side

Java

Python

.net

Php

Node JS

After Node JS we can say JavaScript can be client side as well as server side.

With help of Node Js we can do all type of operation whichever doing by other server side programming language like Java, python etc.

After node we can run JavaScript program outside browser environment.

**REPL** : read Eval print loop terminal

Client Side JavaScript pre defined hierarchy

BOM :Browser Object Model

DOM : Document object model

window.document.write(“Welcome”);

document.write(“Welcome”);

alert(“Welcome”);

window.alert(“Welcome”);

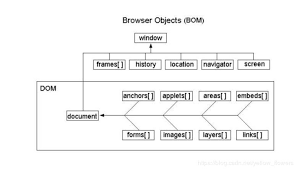
Object -🡪 Property (variables)

Behaviour (function)

Object ---🡪 Property

Behaviour

Object



IN Server side JavaScript we can’t use BOM and DOM. Because we are running js program outside browser area.

In JavaScript it can be client side or server side we use

var, let or const keyword.

node JS contains modules. Modules is a collection of function, variable, classes to do specific task.

These modules mainly divided into 3 types.

1. Core module
2. User defined module
3. Pre defined or external module

Npm install modulename

Npm install create-react-app

Npm install json-server

Npm install axios

Npm install redux

Npm install jquery

Npm install bootstrap

<script src=”jqueryPath.js”></script>

Non primitive or reference data types.

1. Linear reference data types

In linear data types is follow to store the data in sequence order.

1. Array : Array is a type of linear data structure in JS which allow to store more than one value of any types (In JS Or Python). But if we use array concept in C or C++ or Java it allow to store same types of values. Array generally known as fixed in memory size (C or C++ or Java).
2. Stack :Stack is a type of linear data structure which is use to achieve concept as First In Last Out(FILO) or Last In First Out(LIFO)
3. Queue : Queue is a type of linear data structure which use concept as First In First Out (First In First Out).
4. LinkedList : It is a type of linear data structure which use node concept to store the data.
5. Dequeue : In Queue we are adding data from one end and remove the data from another end. But in Dequeue is a type of Queue which support features as we can add the data from both the end as well as remove the data from both end.
6. Non linear reference data types.

Non linear data types which doesn’t use sequence concept to store the data.

* 1. Tree : which we want to store the data as tree structure then we can use Tree non linear data structure. Example : binary tree or binary search.
  2. Graphs : Graph is a type of non linear data structure which use nodes and edge concept.
  3. Set : it is a type of non linear data structure which mainly use to store unique in any order.
  4. Map : it is use to store key-value format. Key is unique and value may be duplicate.

Searching and sorting technique

Binary search

Linear search

Bubble sort

Selection sort

Heap sort

Etc

Array :Array is a linear data structure which use store more than one value of different type in JS. Which index concept we can retrieve the value from array. Index position start from zero till size-1.

Generally is known as fixed in memory size.

Types of array

1. Single dimension array ie can be row or column
2. 2- dimension array row and columns.
3. 3- dimension array x, y and z axis.

Jagged array (non uniform array ) : in this type of array non mandatory number of column for each row must be same.