# Node Js

1. What is Node Js?
   * 1. Node Js is a java Script Runtime “java Script on Server”.
     2. Node Js uses V8(it is written in C++) compiles a java Script to a Machine Code.

1. require(‘fs’);
   1. In Java Script require(‘fs’) is function used to include the built-in ‘fs’(file System Module) Module.

#### Topics

1. **JavaScript Intro**
2. **Node.js Basics**
3. **Efficient Development**
4. **Using Express.js**
5. **Templating Engines**
6. **Model-View-Controller(MVC)**
7. **Advanced Routes & Models**
8. **Node + SQL (MySQL)**
9. **Using Sequalize**
10. **Node + NoSQL (MongoDB)**
11. **Using Mongoose**
12. **Sessions & Cookies**
13. **Authentication**
14. **Sending E-Mails**
15. **Authentication Deep Dive**
16. **User Input Validation**
17. **Error Handling**
18. **File Uploads & Download**
19. **Pagination**
20. **Async Requests**
21. **Handling Payments**
22. **REST API Basics**
23. **Advanced Rest Api Features**
24. **Using Async-await**
25. **Websockets & Socket.io**
26. **GraphQL**
27. **Deployment**
28. **Beyond Web Servers**
29. **Node + TypeScript, Deno**

**The REPL**

**R -** Read -> Read User Input.

**E -** Eval -> Evaluate User Input.

**P -** Print -> Print Output (Result).

**L -** Loop -> Wait For New Input.

**Execute Files (vs) Use the REPL**

Execute Files:

1. Used for Real Apps.
2. Predictable Sequence of steps

Use the REPL:

1. Great Playground.
2. Execute code as you write it.

##### JavaScript Intro:

1. Weakly Typed Language.
   1. No explicit type assignment.
   2. Data types can be switched dynamically.
2. Object Oriented Language.
   1. Data can be organized in logical objects.
   2. Primitive and reference types.
3. Versatile Language.
   1. Runs in browser & directly on a PC/server.
   2. Can perform a broad variety of tasks.

###### Example JS Code:

var name = "Vigneshwaran T";

var age = 23;

var isSingle = true;

function userDetails(userName, userAge, userMaritalStatus) {

  return (

    "Name is " +

    userName +

    " and Age is " +

    userAge +

    " and the user is Single: " +

    (userMaritalStatus ? 'Yes' : 'No')

  );

}

console.log(userDetails(name, age, isSingle));

OutPut:

Name is Vigneshwaran T and Age is 23 and the user is Single: Yes

1. **let & const & var:**
   1. **var** can access a variable before it is declared, although its value will be `undefined`.
   2. **var** variables can be reassigned and mutated (changed) throughout the program execution.

// Example for var

  function example() {

    var x = 10;

    if (true) {

      var x = 20;

      console.log(x); // Output: 20

    }

    console.log(x); // Output: 20

  }

* 1. **let** they only are accessible within the block they are defined in (if statement, loop or function).

// Example for let

  function example() {

    let x = 10;

    if (true) {

      let x = 20;

      console.log(x); // Output: 20

    }

    console.log(x); // Output: 10

  }

* 1. **const** is same like **let** they only are accessible within the block they are defined in

// Example for const

  function example() {

      const x = 10;

      if (true) {

        const x = 20;

        console.log(x); // Output: 20

      }

      console.log(x); // Output: 10

    }

1. **Arrow Functions:**
   1. An Arrow function is a shorter defining functions in JavaScript introduced in ECMAScript 6 (ES6).
   2. An Arrow function provide a more compact and expressive syntax, making code easier to read and write.
   3. (=>) -> This is the symbol of arrow function.
   4. **Syntax for arrow function:**

const functionName = (parameter1, parameter2, ...) => {

  // Function body

  // Code to be executed

  // Return statement (if any)

};

* 1. We don’t need to use function keyword at any place. Because, Arrow function (=>) takes that place.
  2. **Example for Arrow function:**

const addName = (firstName, LastName) => {

    return firstName + ' ' + LastName

}

console.log(addName('Vigneshwaran', 'T'));

//Output: Vigneshwaran T

* 1. We can also write a code without using (“{ }”) Curly braces in arrow function that type of syntax.
  2. And also only when the body of the function in one line then only we use without (“{ }”) Curly braces in arrow functions.
  3. And we not need to add return syntax in one line arrow function.
  4. **Example for One-Line Arrow function:**

const mergeName = (firstName, LastName) => firstName + ' ' + LastName;

console.log(mergeName('Vigneshwaran', 'Thiruselvam'));

//Output: Vigneshwaran Thiruselvam

* 1. Arrow function also have some special behaviour such as lexical scoping ‘this’.
  2. **Example for One-Line Arrow function:**

const person = {

  name: 'Vigneshwaran T',

  age : 23,

  myDetails: function() {

    setTimeout(() => {

      console.log('My Name is ' + this.name + ' and my age is ' + this.age + '.');

      console.log(`My Name is ${this.name} and my age is ${this.age}.`);

    }, 1000);

  }

}

person.myDetails();

//Output: My Name is Vigneshwaran T and my age is 23.

//        My Name is Vigneshwaran T and my age is 23.

1. **Working with Objects, properties & Methods:**
   1. **Object:**
      1. We create an object with in the curly braces and assigned to a one variable name.
      2. Inside the object we must use key value pairs.
      3. A Key Value pair is also called a “property” or a “field” of the object.
      4. In Below example ‘name’, ‘age’, ‘role’ is the properties.
      5. **Example for Object:**

// Objects

    const Person = {

        name: 'Vigneshwaran',

        age: 23,

        role: 'Fullstacker'

    }

    console.log(Person.name); //Output: Vigneshwaran

    console.log(Person.age); //Output: 23

    console.log(Person.role); //Output: Fullstacker

* + 1. We can also write a function inside the object. Here is an example,

// Objects with function

    const Car = {

        model: 'Sports',

        color: 'Black',

        year: 2023,

        description() {

            console.log(`Hi I want ${this.model} Car ${this.color} Color ${this.year} Model.`)

        }

    }

    console.log(Car.description());

* + 1. In JavaScript, methods are functions that are associated with objects.

1. **Array & Array Methods:**
   1. Arrays are comes with square brackets (“[ ]”).
   2. We can write different types of data like string, int, etc.., within an array.
   3. **Example of Array Method:**

// Array

    const development = [

        'Front End',

        'Middleware',

        'Back End',

    ];

// Array Methods

    development.push('UI/UX');

    development.forEach((data) => console.log(data));

    console.log(development);

// Output: Front End

//         Middleware

//         Back End

//         UI/UX

//         [ 'Front End', 'Middleware', 'Back End', 'UI/UX' ]

1. **Arrays, Objects & Reference Types:**
   1. Objects & Arrays are also called as Reference Types.
2. **Understanding Spread & Rest Operators:**
   1. **Splice & Slice**
      1. **Splice:**
         1. The splice() method is used to change the contents of an array by Removing, Replacing, or Adding Elements.
         2. It modifies the original array in place.
         3. The basic syntax of splice() is.,

// splice()

array.splice(start, deleteCount, item1, item2);

* + - 1. **Examples for splice():**

// splice()

// array.splice(start, deleteCount, item1, item2);

// splice() examples

const animals = ['Lion', 'Tiger', 'Black Panther'];

// const modAnimals = animals.splice(1,1); // Delete

animals.splice(4,0,'Leapord'); // Insert Elements

animals.splice(1,1,'Cat'); // Replace Elements

console.log(animals); // Output: [ 'Lion', 'Black Panther' ]

// console.log(modAnimals); // Output: [ 'Tiger' ]