Assignment 1

1. **Explain the use of JavaScript (or what you can do using a JavaScript)?**

- JavaScript is used by programmers across the world to create dynamic and interactive web content like applications and browsers.
- JavaScript is a text-based programming language used both on the client-side and server-side that allows you to make web pages interactive.
- Uses of JavaScript: -
    1. Web Development
    2. Web Applications
    3. Presentations
    4. Server Applications
    5. Games
    6. Mobile Apps.

2. **What is the difference between clint side and server side?**

- Client-side programming includes any coding or computation or effects or animation or any sort of interaction your website performs with the user via browser. But server-Side programming is that which performs all the task in the server only.

- *Client-Side JavaScript.*

Client-Side JavaScript (CSJS) is an extended version of JavaScript that enables the enhancement and manipulation of web pages and client browsers. In a browser environment, your code will have access to things provided only by the browser, like the document object for the current page, the window, functions like alert that pop up a message, etc. The main tasks of Client-side JavaScript are validating input, animation, manipulating UI elements, applying styles, some calculations are done when you don't want the page to refresh so often. In web developing it's the browser, in the user's machine, that runs this code, and is mainly

done in JavaScript. Also, this code must run in a variety of browsers.

- *Server-Side JavaScript.*

Server-Side JavaScript (SSJS) is an extended version of JavaScript that enables back-end access to databases, file systems, and servers. Server-side JavaScript is JavaScript code running over a server local resource, it's just like C# or Java, but the syntax is based on JavaScript. A good example of this is Node.JS, with Node.JS you write JavaScript to program on the server side, and that code can be seen as normal C#, C, or any other server-side language code. Moreover, with server-side code, you can still send JavaScript to the client-side, but there is a great difference between both, because the client-side code is restricted to the client's machine resources, in terms of computing power and permissions. For example, client-side JavaScript can't access the client's hard disk, while with server side you can access your server hard disk without any problem. The primary advantage to server-side scripting is the ability to highly customize the response based on the user's requirements, access rights, or queries into data stores.

3. What is Node.js?

- Node.js is an open-source and cross-platform JavaScript runtime environment. It is a popular tool for almost any kind of project!
- Node.js runs the V8 JavaScript engine, the core of Google Chrome, outside of the browser. This allows Node.js to be very performant.
- A Node.js app runs in a single process, without creating a new thread for every request. Node.js provides a set of asynchronous I/O primitives in its standard library that prevent JavaScript code from blocking and generally, libraries in Node.js are written using non-blocking paradigms, making blocking behavior the exception rather than the norm.

4. Explain Scope in JavaScript?

- Scope determines the accessibility (visibility) of variables.
- JavaScript has 3 types of scope:

    1. Block scope
    2. Function scope
    3. Global scope

5. JavaScript is asynchronous or synchronous?

- JavaScript is Synchronous, it is a synchronous, single-threaded language. Because it has a single thread that's why it can only execute one command at a time and the other commands need to wait for executing before the running command executes. And the term synchronous means one at a time. So, after these conversions, we get to know that JavaScript only executes one command or a single block of code at a time that means it is blocking.
- But What if I say JavaScript has asynchronous behavior also. Yes, I am not totally wrong because we can manipulate the behavior of JavaScript by using asynchronous operations like promises, callbacks etc. It can also make AJAX calls, which means if we make an ajax call then the user can still work or get his other commands done while the request is waiting for a response. That means we can manipulate js behavior in an asynchronous way.

6. JavaScript is Single-threaded or multi-threaded?

- JavaScript is a single-threaded language, which means it has only one call stack that is used to execute the program. The call stack is the same as the stack data structure that you might read in Data structures. As we know stacks are FILO that is First in Last Out. Similarly, within the call stack, whenever a line of code gets inside the call stack it gets executed and move out of the stack. In this way, JavaScript is a single-thread language because of only one call stack.
- JavaScript is a single-threaded language because while running code on a single thread, it can be easy to implement as we don’t have to deal with the complicated scenarios that arise in the multi-threaded environment like deadlock.

7. **Explain DOM in your own words?**

The Document Object Model (DOM) is a programming interface for web documents. It represents the page so that programs can change the document structure, style, and content. The DOM represents the document as nodes and objects; that way, programming languages can interact with the page.