Assignment:1

Aim:

Building a Simple Web Server in Node.js

Hardware Requirement:

- **Laptop: HP Omen 15**
    - **RAM: 16 GB**
    - **Storage: 1 TB SSD**
    - **GPU: RTX 3060**
    - **Processor: Ryzen 7 5000 series**
    - **Operating System: Windows 11**

Software Requirement:

- **Programming Language: Node JS**
- **Integrated Development Environment (IDE): VS Code**

Knowledge Requirement:

- **Understanding of Web Fundamentals**
- **Familiarity with JavaScript**

Theory:

Node.js is a server-side JavaScript runtime environment that facilitates the execution of JavaScript code beyond the confines of web browsers. With an event-driven, asynchronous architecture, Node.js employs a single-threaded event loop to efficiently handle numerous concurrent connections without relying on traditional multi-threading.

Importing the **http** module:

- require("http"): Imports the built-in http module in Node.js.

Creating an **HTTP server**:

- **http.createServer**(callback): Creates an HTTP server.
- **callback(req, res)**: A function called when a request is made, taking the request (req) and response (res) objects as parameters.
- **req**: Represents the incoming HTTP request.
- **res**: Represents the server's response to the client.

Sending a response:

- **res.write("...")**: Writes the specified string to the response.
- **res.end()**: Signals that the response is complete.

Making the server listen:

- **server.listen(port, [hostname], [callback])**: Makes the server listen on a specified port and hostname.
- port: The port number to listen on.
- hostname: The hostname or IP address to bind the server to. (Optional, defaults to localhost).
- callback: An optional function to run when the server starts listening.

Code and Output:

- **Code:**

```
const http = require("http");

const server = http.createServer((req,res)=>{
    res.write("Hey Here is Dhruv Bhatt")
    res.end();
})

server.listen(8081,"127.0.0.1",()=>{
    console.log("Server is Listening Requests on Port 8081.");
})
```

- **Output:**

```
E:\programing Releted\Collage Labs\Sem 6\Advanced Web Tech\Node JS>node se
rver.js
Server is Listening Requests on Port 8081.
```

Conclusion:

Node.js code showcases the creation of a minimalistic HTTP server using the built-in http module. By importing the module and utilizing the http.createServer() method, a server is established to respond to incoming requests. The callback function within createServer handles these requests, responding with the message "Hey Here is Dhruv Bhatt." The use of request (req) and response (res) objects facilitates communication between the server and clients. The server is configured to listen on port 8081, with an optional specification of the hostname (set to 127.0.0.1 or localhost in this case). The code concludes with a log statement indicating that the server is actively listening for requests on port 8081.

References:

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https://nodejs.org/en/learn/getting-started/introduction-to-nodejs

https://medium.com/@dhwajgupta27/build-a-node-js-server-in-5-minutes-quick-and-easy-server-setup-6eb594e8b26