Task 13 – Date 02/03/2025

Fetch API & Async/Await

1. **Fetch API -** Making API calls using fetch()
    - The **Fetch API** in JavaScript is a modern, built-in interface for making HTTP requests like GET, POST, PUT, DELETE to servers and handling responses easily.
    - It is promise-based, making it simpler to work with asynchronous requests compared to the older XMLHttpRequest method.
    - It is promise-based, meaning it returns a promise that resolves to a response object, making it easy to handle asynchronous requests using then and catch.
    - Example:

```
fetch('https://api.example.com/data')
  .then(response => response.json())
  .then(data => console.log(data))
  .catch(error => console.error('Error:', error));
```

        - **fetch() makes a GET request to the URL.**
        - **response.json() converts the response to JSON format.**
        - **then handles the data if the request is successful.**
        - **catch handles any errors if the request fails.**
2. **Async/Await**
    - Async and await are keywords in JavaScript that make working with promises easier and code more readable by allowing asynchronous code to be written in a synchronous-looking way.
    - They are used with functions that return promises, simplifying the process of handling asynchronous operations like fetching data from an API or reading files.
    - **How async and await Work**
        - **async:**
            - Used to declare a function as asynchronous.
            - An async function always returns a promise.
            - If the function returns a value, the promise is resolved with that value.
            - If the function throws an error, the promise is rejected.
        - **await:**
            - Can only be used inside an async function.
            - Pauses the execution of the async function until the promise is resolved or rejected.
            - Makes the code wait for the promise to settle before moving to the next line.

Handling promises

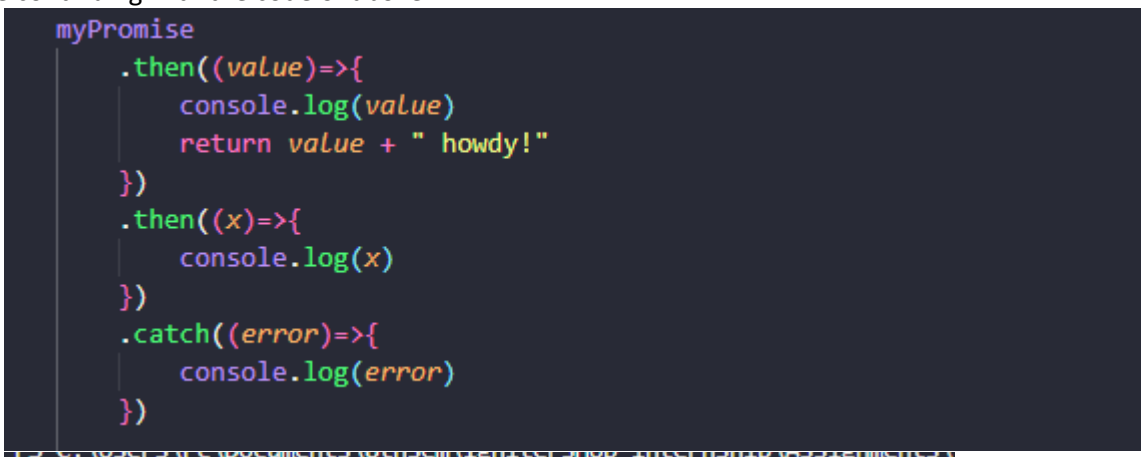
- A promise in JavaScript is an object that represents the eventual completion or failure of an asynchronous operation.
- It acts as a placeholder for a value that will be available in the future.
- Promises help manage asynchronous code (like API calls or file reading) without causing callback hell, making the code easier to read and maintain.
- **A promise can be in one of these three states:**
    1. **Pending**: The initial state, neither fulfilled nor rejected.
    2. **Fulfilled**: The operation completed successfully, and the promise has a value.
    3. **Rejected:** The operation failed, and the promise has a reason for failure (usually an error).

- A promise can be created in following way using Promise constructor
    - 

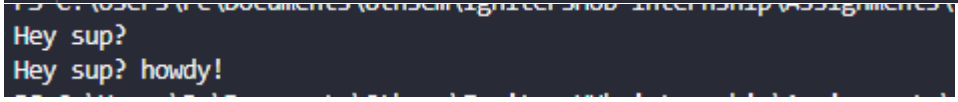
```
const myPromise = new Promise((resolve,reject)=>{
    let success = true;
    if(success) resolve("Hey sup?")
    else
        reject("Get out")
})
```

- resolve(value): Marks the promise as fulfilled and passes value to .then().
- reject(error): Marks the promise as rejected and passes error to .catch().
- There are two main ways to handle a promise
    1. **Using then() and catch()**
    2. **Using async and await**

Using then() and catch()

- Using .then() and .catch() involves callback functions to handle the resolved or rejected states of a promise.
- **.then():** Runs if the promise is fulfilled. Receives the value passed to resolve().
- .**catch():** Runs if the promise is rejected. Receives the error passed to reject().
- There can be multiple **then()** and for all of the then()s there will be only one **catch(),** if any error is thrown at any place the catch block will be able to catch the error thrown.
- Example continuing with the code of above:
    - 

```
myPromise
    .then((value)=>{
        console.log(value)
        return value + " howdy!"
    })
    .then((x)=>{
        console.log(x)
    })
    .catch((error)=>{
        console.log(error)
    })
```

    - 

```
Hey sup?
Hey sup? howdy!
```

Using async and await

- The async and await approach makes asynchronous code look synchronous and is easier to read.
- Example:

- **async function**: Allows using await inside it.
- **await keyword:** Pauses the function execution until the promise is settled.
- **try and catch:** Used for error handling.

Practical Exercise

Objective: Fetch and display a random joke from an API (https://official-joke-api.appspot.com/random_joke).

Source code:

HTML:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Document</title>
</head>
<body>
  <h1>
    Press the button below for a Dad Joke
  </h1>
  <p></p>
  <button>Crack me up</button>
  <script src="index.js"></script>
</body>
</html>
```

JS:

```
async function fetchAJoke(){
   try{
      result = await fetch("https://official-joke-api.appspot.com/random_joke")
      if(!result.ok){
         throw new Error("Failed to fetch")
      }
      const joke= await result.json()
      document.querySelector("p").innerHTML = `<h3>${joke.setup}</h3><h3>${joke.punchline}</h3>`
      console.log(joke)
   }
   catch(error){
      console.log(error)
   }
}
document.querySelector("button").addEventListener("click",fetchAJoke)
```

Output: