

## DAY 1 Html, CSS, Javascript

### HTML (Describes the structure of the web page)

#### Key Concepts:

- Document structure with <!DOCTYPE>, <html>, <head>, and <body> tags
- Semantic elements like headings (<h1> to <h6>)
- Text formatting with paragraph tags (<p>)
- Interactive elements like buttons
- Form creation with various input types

#### Code Example:

```
<!DOCTYPE html>

<html lang="en">

<head>

  <meta charset="UTF-8">

  <meta name="viewport" content="width=device-width, initial-scale=1.0">

  <title>My First Page</title>

  <link rel="stylesheet" href="styles.css">

  <script src="script.js"></script>

</head>

<body>

  <div>

    <h1>Main Heading</h1>

    <p id="content">This is a paragraph.</p>

    <button id="myButton" onclick="handleClick()">Click Me</button>

  </div>

</body>

</html>
```

## CSS (Styling of the web page)

### Key Concepts:

- Selectors (element, class, ID)
- Box model (margin, border, padding)
- Color and typography properties

### Code Example:

```
body{  
    font-family: sans-serif;  
    background-color: #eaeaea;  
    margin: 0;  
    display: flex;  
    justify-content: center;  
    align-items: center;  
    height: 100vh;  
}  
  
.container {  
    background-color: white;  
    padding: 20px;  
    border-radius: 6px;  
    width: 280px;  
    box-shadow: 0 0 5px rgba(0, 0, 0, 0.1);  
}  
  
#content {  
    font-style: italic;  
}
```

## JavaScript (Behaviour of the web page)

### Key Concepts:

- Variables and data types
- Control structures (conditionals, loops)
- Functions
- Array manipulation methods
- Local storage for data persistence
- DOM manipulation

### Code Examples:

#### Variables and Basic Operations:

```
// Variable declarations
```

```
let username = "Abden";
```

```
let age = 25;
```

```
const isLoggedIn = true;
```

```
// Array operations
```

```
let names = ["Aaryan", "Abden", "Alex"];
```

```
names.forEach(name => console.log(name));
```

```
names.push("New Name");
```

#### Local Storage:

```
// Store user details
```

```
function storeUserDetails() {
```

```
    const userDetails = {
```

```
        fullName: document.getElementById('fullname').value,
```

```
        username: document.getElementById('username').value,
```

```
        email: document.getElementById('email').value
```

```
    };
```

```

    localStorage.setItem('userDetails', JSON.stringify(userDetails));
}

// Retrieve user details
function displayUserDetails() {
    const userDetails = localStorage.getItem('userDetails');
    if (userDetails) {
        const data = JSON.parse(userDetails);
        document.getElementById('userDetails').innerHTML = `
            <p><strong>Name:</strong> ${data.fullName}</p>
            <p><strong>Username:</strong> ${data.username}</p>
        `;
    }
}

```

## Git Version Control

Git provides tools for tracking changes and collaborating on code.

### Key Git Commands:

git init

git add index.html

git add .

git commit -m "Add login functionality"

git remote add origin <https://github.com/abden/repo.git>

git push -u origin main

git pull origin main

## DAY 2 Event, Validation, Promises

### **EVENT (Something a browser or user does)**

- Page has finished loading
- HTML input was changed
- An HTML button was clicked (submit button onclick())
- **setTimeout** delays a task to run once after a set time.
- **setInterval** keeps running a task repeatedly at regular time intervals.
- **clearInterval** stops the repeated task started by setInterval.

### **Page on load event**

```
<body onload="alert('Page is loaded')">
```

### **Button Clicked event**

```
<button  
    onclick="this.innerHTML = Date()">Time is :  
</button>
```

### **Mouse Entered/left event**

```
<button  
    onmouseenter="this.innerHTML = 'Mouse Entered'"  
    onmouseleave="this.innerHTML = 'Mouse Left'">Mouse  
</button>
```

### **Key pressed**

```
<input type="text" onkeypress="pressed()"/>
```

### **Set Timeout, setInterval, clearInterval (There are other events other than these 3)**

```
<button onclick="setTimeout(buttonclick,2000)">Timeout</button>\n<button onclick="meow= setInterval(btnclick,2000)">Interval</button>\n<button onclick="clearInterval(meow)">Stop Interval</button>
```

## Form Validation

- Form to add vendors, users, with ID, name, rating, and products and so on
- Validation for unique IDs, name length ( $\geq 5$ ), and products
- Dynamic product fields (add/remove)
- Display vendors sorted by rating
- Search functionality
- View detailed information in a modal
- Clear all vendor data functionality
- Store vendors as objects in **localStorage**
- Sort vendors by rating
- Validate input before saving
- Learned how to delete data from local Storage

## Promises

- Learned about Promises, which are objects representing the eventual completion or failure of asynchronous operations.
- Can be used for Error Handling
- States: **resolve()**, **reject()**
- Similar to try catch finally

## Fetch an image from a UPI

- Get image from an API
- Store it into a variable
- `fetch()`, `then()`
- async function  
  
    `async function getCat()`  
    `await fetch(url).then(res => res.json()).then(data => data.url)`
- await to fetch a data from API

### Day 3 TypeScript

- `npm -v`
- `npm init -y`
- `npm install typescript --save-dev`
- `npm tsc init`
- `npx tsc filename.ts`
- `node filename.js`

TypeScript adds static typing to JavaScript, which helps **catch errors before runtime**.

- **Basic Types & Functions:**

Started with simple functions and type annotations

```
let name: string = "aaryan";
```

- **Interfaces:**

Learned how to define object structures (similar to Java interfaces)

```
interface User {  
  name: string;  
  id: number;  
  role: roles;  
}
```

- **Custom Types:**

Created union types to restrict values

```
type roles = "Trainer" | "Developer" | "Tester";
```

- **Classes:**

Implemented classes with constructors and properties

```
class UserAccount {  
  name: string;  
  id: number;  
}
```

- **Interface Implementation:**

Made classes implement interfaces

```
class Vendor implements VendorInterface {...}
```

- **Optional Properties:**

Used the ? symbol for optional properties

```
type Vendor = {  
  lname?: string; // optional  
}
```

- **Arrays & Sorting:**

Worked with typed arrays and sorting functions

```
const vendors: Vendor[] = [...];  
vendors.sort((a, b) => a.id - b.id);
```

- **Type 'any':**

Used for values where the type isn't known

```
productName: any;
```

- **String Interpolation:**

Used template literals for string formatting

```
console.log(` ID: ${e.id}, Name: ${e.name}`);
```

- **Conditional Expressions:**

Implemented ternary operators

```
e.lname !== undefined ? e.name + " " + e.lname : e.name
```



- **Promise to Get the response from API:**

Get the data from url in json format data and display the json data using Promise<Response>.

```
function getFacts(url: string): Promise<Response> {
```

```
    return fetch(url).then(res => res.json());
```

```
getFacts("https://cataas.com/cat?width=200;height=200;json=true").then(data =>  
    console.log(data));
```

## Day 4 MCQ Assignment, Practicing Typescript

### 1. Microsoft

Microsoft created and maintains TypeScript as an open-source programming language. It can be used to develop JS applications in both client and server side.

### 2. Node

Commonly used with node.js which runs javascript on server side and other backend technologies as well.

### 3. JavaScript

TypeScript is superset of JavaScript that adds static typing. After compilation TypeScript is converted/compiled to JavaScript.

### 4. extends

Inheritance is implemented using the extends keyword similar to JavaScript Inheritance

### 5. `var x = "string";`

The variable has no type defined after declaring the variable there should be a colon space type.

This is a JavaScript syntax, not a TypeScript syntax

### 6. `var x: number = 999;`

This is TypeScript syntax,

The variable x of number type is stored the value 999.

### 7. `.ts`

TypeScript files are typically stored in .ts format, for JavaScript it is .js

## 8. **tsc filename.ts**

tsc is the command to run TypeScript compiler to compile it to .js file, we can also execute a .ts file using node tsc filename.ts

## 9. **tsc filename.ts -w**

Make the compiler continuously watch for changes in TypeScript files and recompile automatically when changes are detected.

## 10. **super()**

use the super() keyword within the child class's constructor.

```
class Parent {  
  constructor(public name: string) {  
    console.log("Parent constructor called");  
  }  
}  
  
class Child extends Parent {  
  constructor(name: string, public age: number) {  
    super(name);  
    console.log("Child constructor called");  
  }  
}  
  
const child = new Child("John", 25);
```

## 1. Sort

Practiced on how to use the sort function efficiently.

```
vendors.sort((a, b) => a.id - b.id);
```

## 2. Filter

Go through each item in the products array.

For every item (p), check if its price is less than or equal to maxPrice.

Only the products that pass this test will be included in the result.

filter() is a built-in method that returns a new array of items that match a condition.

```
products.filter(p => p.price <= maxPrice);
```

## 3. Finding

It stops at the first match.

If found, it prints the details

If not found, it says "Product not found."

```
products.find(p => p.name === productName);
```

## 4. Every/Some

every - checks if all items match the condition.

some - checks if at least one item matches.

```
const allUnder100 = products.every(p => p.price < 100);
```

```
const anyUnder30 = products.some(p => p.price < 30);
```

## 5. Mapping

map() goes through every product.

For each product, it returns just the name.

You get a new array of only names (original array stays the same).

```
// Map to get only names
```

```
const productNames = products.map(p => p.name);
```

## 6. Reduce

(sum, p) => sum + p.price \Adds the current product's price to the total sum.

0 is the starting value of the sum.

It goes through all items and returns one final result:

```
const totalPrice = products.reduce((sum, p) => sum + p.price, 0);
```

## 1. Decorators/Modules

Decorators = add logic to classes/functions automatically.

```
// Enable "experimentalDecorators": true in tsconfig.json
```

```
function Logger(constructor: Function) {
```

```
  console.log("Class created:", constructor.name);
```

```
}
```

```
@Logger
```

```
class Product {
```

```
  constructor(public name: string, public price: number) {}
```

```
}
```

```
const p1 = new Product("Book", 100);
```

Modules = split code into files and share using export / import

### **mathUtils.ts (a separate file)**

```
export function add(a: number, b: number): number {  
    return a + b;  
}  
  
export const PI = 3.14;
```

### **app.ts**

```
import { add, PI } from './mathUtils';  
  
let result = add(10, 5);  
  
console.log(`Result: ${result}`);  
  
console.log(`Value of PI: ${PI}`);
```

## Day 5 Operators

### 1. Keyof operator

The keyof operator in TypeScript is used to **extract the keys of an object type as a union of string literal types**. It provides a way to **ensure type safety** when working with object properties **dynamically**.

```
function getProperty<T, K extends keyof T>(obj: T, key: K): T[K] {  
    return obj[key];  
}
```

### 2. Rest operator

```
function sum(...numbers: number[]): number {  
    return numbers.reduce((total, num) => total + num, 0);  
}  
const res = sum(1,2,3);
```

Collects all remaining arguments into an array. When you don't know how many arguments will be passed to a function, use rest operator.

**Rest Operator** is used in **function parameters**. **Spread Operator** (also ...) is used to **expand** elements, like:

```
sumof(...products)
```

### 3. Overloading

Define **multiple function signatures** for a single method, each with different parameter types or counts.

In TypeScript, **you define overloads with multiple function signatures**, and then provide **one actual implementation** that handles all cases.

```
speak(s: string): string;  
speak(n: number): string;  
speak(b: boolean): string;
```

These are the **overload declarations**. They tell TypeScript what calls are allowed

```
speak(arg: any): any {  
    if (typeof arg === 'number') {  
        return `Meow number ${arg}`;  
    }  
    if (typeof arg === 'string') {  
        return `Meow string ${arg}`;  
    }  
    if (typeof arg === 'boolean') {
```

```

        return `Meow boolean ${arg}`;
    }
}

```

This is the **actual implementation** that handles **both overloads**. TypeScript only allows **one implementation**, and it must be compatible with all the declared signatures.

#### 4. Modules (import/export)

Consider two files, one for importing and exporting. Now we will split into files and share using **import** and **export**.

```

//mathUtils.ts(a separate file)
export function add(a: number, b: number): number {
    return a + b;
}
export const PI = 3.14;
export function area(radius: number): number {
    return PI * radius * radius;
}
//sub.ts(a separate file)
export default function subtract(a: number, b: number): number {
    return a - b;
}

```

When we use **export**, we are making **functions, variables, classes, or interfaces available to other files**. **default** is used when you're exporting **one main thing** from a module.

```

//app.ts(another file)
import {add, PI} from './mathUtils';
let result = add(10, 5);
console.log(`Result: ${result}`);
console.log(`Value of PI: ${PI}`);

//subfun.ts(a separate file)
import subtract from './sub.ts';
console.log(subtract(5,10));

```

When we use import to **bring in code that was exported from another module**.

If we want to **import everything** from a module use import \* as anyname from './';

```

import * as MathUtils from './mathUtils';

console.log(MathUtils.add(5,10));
console.log(MathUtils.PI);

```



To Rename things when importing we can do it like this

```
import { multiply as mul } from "../1_export";  
console.log(mul(4, 5));
```

## DAY 6 – Playwright

### 1. Playwright Installation

```
npm init playwright@latest
```

### 2. Page Object Model (POM)

It is a design pattern commonly used in **automation** testing

- Used with tools like **Playwright**, Selenium, Cypress
- Makes Tests more **maintainable**, **reusable**, and **readable**
- **test logic is separated from UI details.**

In POM, each page or component of your application has a corresponding class (or object) that encapsulates:

- The **locators (selectors)** for elements on the page
- The **actions** you can perform on the page
- Any **assertions** or checks related to that page

### 3. Page Navigation

```
await page.goto('https://www.easemytrip.com/');
```

### 4. Title Assertion:

```
await expect(page).toHaveTitle(...)
//ensures the correct page is loaded.
```

### 5. Click Actions with Visibility Check

Always check visibility before clicking for stability:

```
await expect(button).toBeVisible();
await button.click();
```

### 6. Waiting Strategies

Use **waitForTimeout()** for debugging or better yet, wait for specific elements or states.

## 7. Element locators

**XPath** is powerful but use **CSS selectors** when possible for better performance.

```
const getStarted = page.getByText('Try Typescript Now');  
const username = page.locator("#user-name");
```

## 8. Form Interactions / Filling Inputs

```
await username.fill("standard_user");  
await password.fill("secret_sauce");
```

### Features:

- Auto wait
- Cross browser Compatibility – Chrome, Firefox, Edge, Webkit.
- Multi-platform – Mac OS, Windows, Linux
- Multilingual Flexibility – Supports Java, Python, Java Script, C#, .NET

### Advance Feature:

- Tracing and Debugging – take screenshot, video recording
- Network Interception
- Browser Context Management
- Codegen Tool
- Java Script – Asynchronous this one does not execute the order wise.
- **await – used to wait each action**

### Installation of Playwright:

- **npm install playwright@latest**

### Run the test:

- **npx playwright test**

Run the test headed mode:

- `npx playwright test --headed`

Run the test UI mode:

- `npx playwright test --ui`

Get the report in html page:

- `npx playwright show-report`

Import the playwright and expect in .ts file

- `import {test, expect} from "@playwright/test";`

### 1. Navigate to the website

```
import { test, expect } from '@playwright/test';

test("Place the Order", async({page})=>{
  await page.goto("https://www.saucedemo.com/");
```

### 2. Assertion in Playwright:

```
const orderConfirmation = await page.locator(".complete-header");
await expect(orderConfirmation).toHaveText("Thank you for your order!");
```

### 3. Different type of assertion:

```
await expect(locator).toBeChecked();
```

```
await expect(locator).not.toBeChecked();
```

```
await expect(locator).toBeDisabled();
```

```
await expect(locator).toBeEnabled();
```

```
await expect(locator).toBeEditable();
```

```
await expect(locator).toBeEmpty();
```

## Example Automation Script:

```
test('End to end test for cart functionality', async ({ page }) => {
  await page.goto('https://www.saucedemo.com/');
  await expect(page).toHaveTitle("Swag Labs");
  const username = page.locator("#user-name");
  await username.fill("standard_user");
  const password = page.locator("#password");
  await password.fill("secret_sauce");
  const login = page.locator("#login-button");
  await login.click();
  const firstItem = page.locator(".inventory_item_name").first();
  await firstItem.click();
  const addToCart = page.locator("#add-to-cart");
  await addToCart.click();
  //I will now verify cart quantity is equals to one
  const cartIcon = page.locator(".shopping_cart_badge");
  await expect(cartIcon).toBeVisible();
  const cartQuantity = await cartIcon.textContent();
  if (cartQuantity === "1") {
    console.log("Cart quantity is 1");
  }
  cartIcon.click();
  const checkoutBtn = page.locator("#checkout");
  await expect(checkoutBtn).toBeVisible();
  await checkoutBtn.click();
  await page.fill("#first-name", "John");
  await page.fill("#last-name", "Doe");
  await page.fill("#postal-code", "12345");
  await page.click("#continue");
  const finishBtn = page.locator("#finish");
  await expect(finishBtn).toBeVisible();
  await finishBtn.click();
  const orderConfirmation = page.locator(".complete-header");
  await expect(orderConfirmation).toBeVisible();
  const orderText = await orderConfirmation.textContent();
  await expect(orderText).toContain("Thank you for your order!");
})
```

## End-to-End Cart Functionality Test

This automated test script, written using Playwright, verifies the full cart and checkout flow on the **Swag Labs** demo website. The test covers the following steps:

### 1. Navigation & Login:

- Navigates to `https://www.saucedemo.com/`
- Asserts that the page title is "Swag Labs"
- Logs in using standard credentials: `standard_user` / `secret_sauce`

## 2. Item Selection & Cart Interaction:

- Clicks on the first listed item
- Adds the item to the cart
- Asserts the cart badge is visible
- Confirms that the cart quantity is correctly updated to **1**

## 3. Checkout Process:

- Proceeds to the cart and initiates checkout
- Fills out checkout information with mock user data (name and postal code)
- Continues to the order summary and completes the purchase

## 4. Order Confirmation:

- Verifies that the final confirmation message appears
- Asserts the confirmation contains the expected message: *"Thank you for your order!"*

This test ensures that the cart functionality—from product selection to successful order placement—works as intended.

## Day 2

### 1. To execut a particular test

```
npx playwright test -g "has title"
```

### 2. To Rerun a failed test

```
npx playwright test --last-failed
```

### 3. To run the project automation on chromium and enable trace on as well:

```
npx playwright test --project chromium --trace on
```

### 4. Playwright's defineConfig

To set up how my tests should run. This config gives me flexibility across browsers, environment control, retries, and even geolocation emulation.

## 5. General Settings:

**testDir**: Test files are located in the **./tests** directory.

**fullyParallel**: Enables full parallelism across test files.

**forbidOnly**: Ensures **.only is not left** accidentally in source (enabled on CI).

**retries**: Retries failed tests up to **2 times on CI**, none locally.

**workers**: Runs with **a single worker on CI** to avoid parallel execution issues.

**reporter**: Uses the **'html' reporter** for test results.

## 6. use block (Shared Settings for All Projects):

```
use: {
  /* Base URL to use in actions like `await page.goto('/')`. */
  // baseURL: 'http://127.0.0.1:3000',
  baseURL: 'https://playwright.dev/',
  /* Collect trace when retrying the failed test. See
  https://playwright.dev/docs/trace-viewer */
  trace: 'on-first-retry',
  screenshot: 'only-on-failure',
  video: 'on-first-retry'

  // Network configs
  acceptDownloads: false,

  extraHTTPHeaders: {
    'X-My-Header': 'value',
  },

  httpCredentials: {
    username: 'user',
    password: 'pass'
  },

  ignoreHTTPSErrors: true,

  offline: true,

  proxy: {
```

```

    server: '',
    bypass: 'localhost'
  }

  // Emulation options

  colorScheme: 'dark',
  geolocation: { longitude: 12.343535, latitude: 45.56575 },
  locale: 'en-GB',
  permissions: ['geolocation'],
  timezoneId: '',
  viewport: { width: 1280, height: 720 }
},

```

## 7. Browser Projects

```

/* Configure projects for major browsers */
projects: [
  {
    name: 'chromium',
    use: { ...devices['Desktop Chrome'] },
  },

  {
    name: 'firefox',
    use: { ...devices['Desktop Firefox'] },
  },

  {
    name: 'webkit',
    use: { ...devices['Desktop Safari'] },
  },

  /* Test against mobile viewports. */
  {
    name: 'Mobile Chrome',
    use: { ...devices['Pixel 5'] },
  },
  {
    name: 'Mobile Safari',
    use: { ...devices['iPhone 12'] },
  },

  /* Test against branded browsers. */
  {
    name: 'Microsoft Edge',
    use: { ...devices['Desktop Edge'], channel: 'msedge' },
  },

```



```
{
  name: 'Google Chrome',
  use: { ...devices['Desktop Chrome'], channel: 'chrome' },
},
```

## 8. Dev Server (Commented-out):

Option to run a dev server (npm run start) before running tests.

Can be reused locally but starts fresh on CI.

```
/* Run your local dev server before starting the tests */
webServer: {
  command: 'npm run start',
  url: 'http://127.0.0.1:3000',
  reuseExistingServer: !process.env.CI,
},
```

## 9. Special Test States:

- **test.only:** Focuses the test runner only on this test (focus on this test case).
- **test.skip:** Skips the skipped test case.
- **Conditional skip:**
  - Skips a test for chromium only using `test.skip(browserName === 'chromium')`.
- **test.beforeAll**
  - **Pre-test setup logic before all tests run.**
- **Handles:**
  - Waiting for and interacting with a popup (`waitForEvent('popup')`).
  - Inside the popup, finds a close button and clicks it.
  - Listens for browser dialogs like `alert()`, `confirm()`, `prompt()` and accepts them automatically.