1)Sample application development

```
<!DOCTYPE html>

<html>

<body style="font-family:Arial;text-align:center;margin-top:100px">

<h3>Login</h3>

<input id=u placeholder="User">

<br><br><input id=p type=password placeholder="Pass"><br><br>

<button onclick="m.innerHTML=(u.value=='admin'&&p.value=='1234')?'☑ Success':'✖ Invalid'">Login</button>

<p id=m></p>

</body>

</html>
```

OUTPUT:

2)Create a Responsive website using HTML5 and CSS3

```html
<!DOCTYPE html>

<html>

<head>

 <style>

   body {text-align: center;font-family: Arial;margin: 0;}

header, footer {background: green;color: white;padding: 10px;}

   a {color: white;padding: 8px;background: #333;text-decoration: none;}

a:hover {background: #ddd;color: black;}

 </style>

</head>

<body>

 <header>

   <h3>My Webpage</h3>

 </header>

 <a href="#">Home</a>

 <a href="#">About</a>

 <a href="#">Contact</a>

 <p>Welcome! Responsive and simple site.</p>

 <footer>&copy; 2025 MyWebsite</footer>

</body>

</html>
```
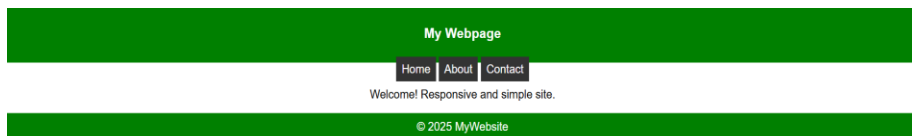
5) create an interactive form with validation using javascript and css3

```
<!DOCTYPE html>

<html>

<body style="font-family:Arial;text-align:center;margin-top:50px">

<h3>Easy Form</h3>

<input id="n" placeholder="Enter Name"><p id="e" style="color:red"></p>

<button onclick="e.innerHTML=n.value?'Submitted: '+n.value:'Name required!'">Submit</button>

<script>

if(n.value)name.value='';

</script>

</body>

</html>
```

Easy Form

xxxx

Submitted: xxxx

Submit

7)optimize a web application for performance

```
<!DOCTYPE html>

<html>

<head><title>Optimized Web App</title>

<style>

body{font-family:Arial;text-align:center;margin:20px}

</style>

</head>

<body>

<h2>Welcome!</h2>
```

```html
<p>Optimized Web App.</p>

<img src="https://via.placeholder.com/400" loading="lazy">

<img src="https://via.placeholder.com/400" loading="lazy">

<script>alert("Hello! Optimized!");</script>

</body>

</html>
```


127.0.0.1:5500 says

Hello! Optimized!

OK

Welcome!

Optimized Web App.

3)create a responsive web app (pwa)that can work offline

Create a new folder name:MyPWA

Inside create 3 files:

1) **index.html**

```
<!DOCTYPE html>

<html>

<head>

 <title>Simple PWA</title>

 <link rel="manifest" href="manifest.json">

 <script>

  if ('serviceWorker' in navigator)

   navigator.serviceWorker.register('sw.js');

 </script>

</head>

<body style="text-align:center;font-family:Arial;background:#e0f7fa;margin-top:100px;">

 <h2>🌐 Simple Offline PWA</h2>

 <p>This app works even offline!</p>

</body>

</html>
```

2) **sw.js**

```
const c = 'pwa-cache', f = ['/', '/index.html'];

self.addEventListener('install', e => e.waitUntil(caches.open(c).then(x => x.addAll(f))));

self.addEventListener('fetch', e => e.respondWith(caches.match(e.request).then(r => r ||
fetch(e.request))));
```

3) **manifest.json**

```
{

 "name": "Simple PWA",

 "short_name": "PWA",

 "start_url": "index.html",
```

```
  "display": "standalone"

}
```

Output:

🌐 Simple Offline PWA

This app works even offline!

8) Implement Automated Testing for JavaScript-Based HTML Application

Create a new folder

Inside create 3 files:

1) **index.html**
```html
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8" />
  <title>Tested App</title>
  <script src="app.js" defer></script>
</head>
<body>
  <h1>Simple App for Testing</h1>
</body>
</html>
```

2) **app.js**
```javascript
function add(a, b) { return a + b; }
function multiply(a, b) { return a * b; }

if (typeof module !== 'undefined') module.exports = { add, multiply };
```
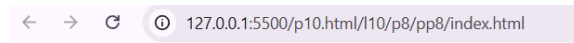
3) **app.test.js**
```javascript
const { add, multiply } = require('./app');

test('adds two numbers', () => {
  expect(add(2, 3)).toBe(5);
});

test('multiplies two numbers', () => {
  expect(multiply(2, 3)).toBe(6);
});
```
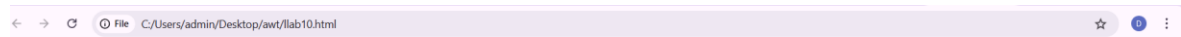
127.0.0.1:5500/p10.html/l10/p8/pp8/index.html

Simple App for Testing

10) Integrate Jwt Authentication In A Node.Js Backend Application

```html
<!DOCTYPE html>
<html>
<head><title>Simple JWT Auth</title></head>
<body style="font-family:Arial;text-align:center;margin-top:80px;">
 <h2>🔐 Simple JWT Auth</h2>
 <input id="user" placeholder="Enter Username"><br><br>
 <button onclick="login()">Login</button>
 <button onclick="show()">Show Token</button>
 <button onclick="logout()">Logout</button>
 <p id="msg"></p>

 <script>
   function login(){let
n=user.value||"Guest",t=btoa(JSON.stringify({user:n,time:Date.now()}));localStorage.setItem("j
wt",t);msg.innerText="✅ Token saved!";}
   function show(){let t=localStorage.getItem("jwt");msg.innerText=t?"🔑 Token: "+t:"⚠️ No
token found.";}
   function logout(){localStorage.removeItem("jwt");msg.innerText="🚪 Logged out!";}
 </script>
</body>
</html>
```