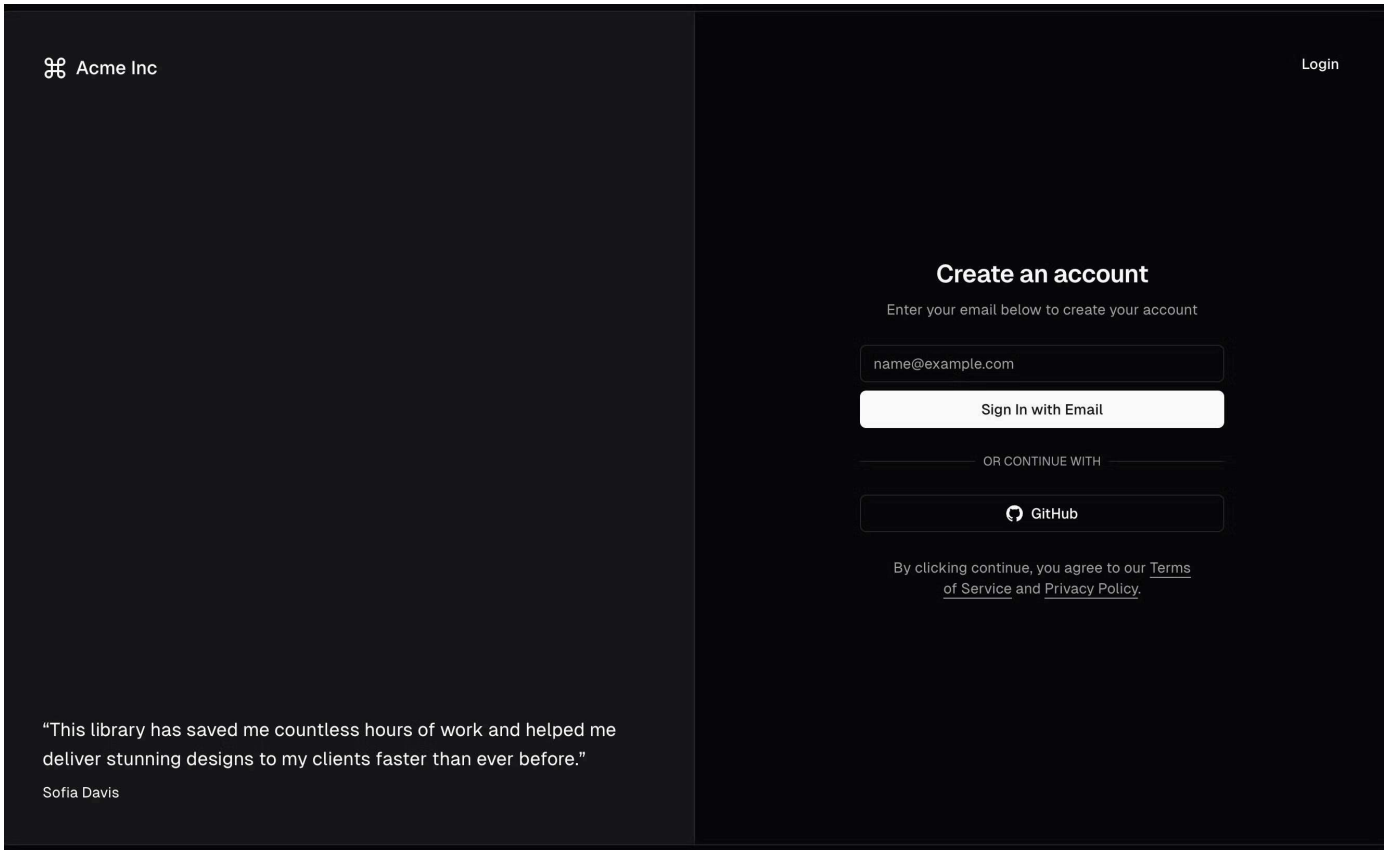
Authentication 1 of 8

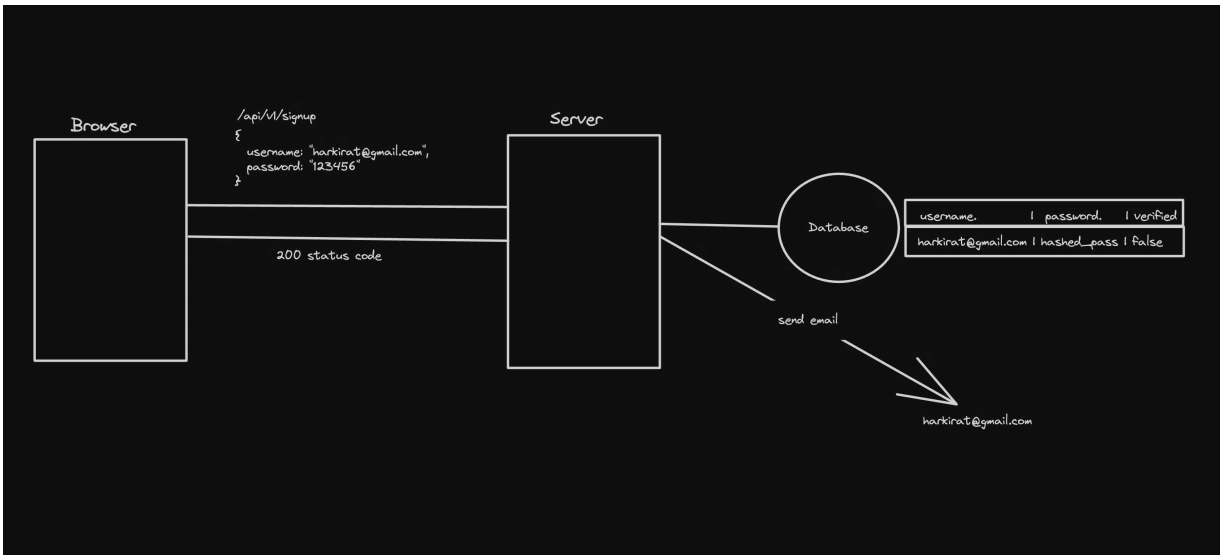
What is authentication?

Authentication is the process of letting users signup/signin into websites via username / password or using SSO (single sign on)

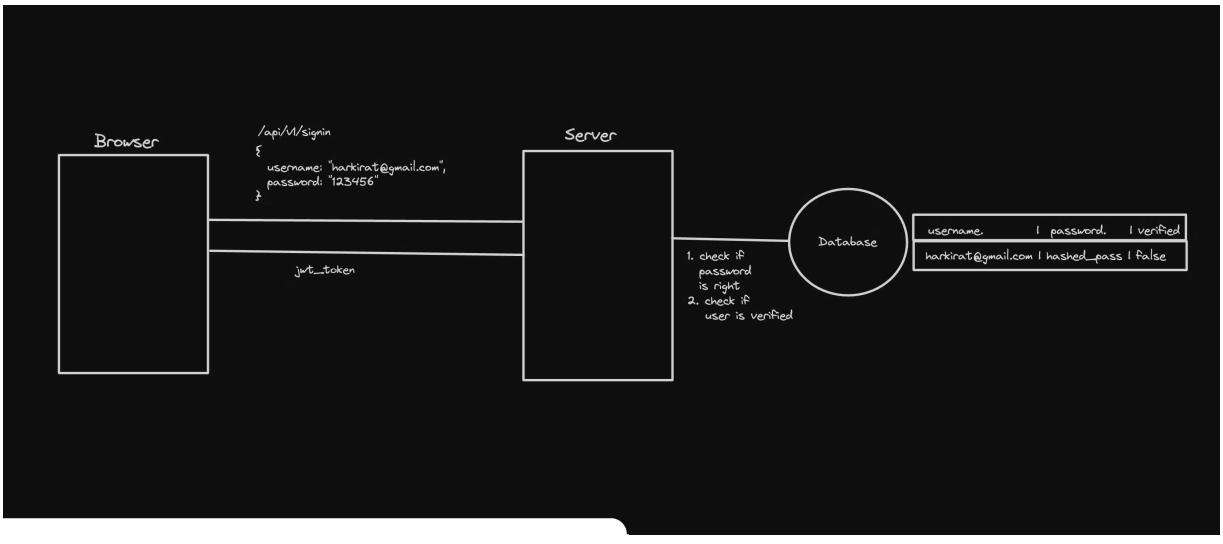


Authentication using jwt + localstorage

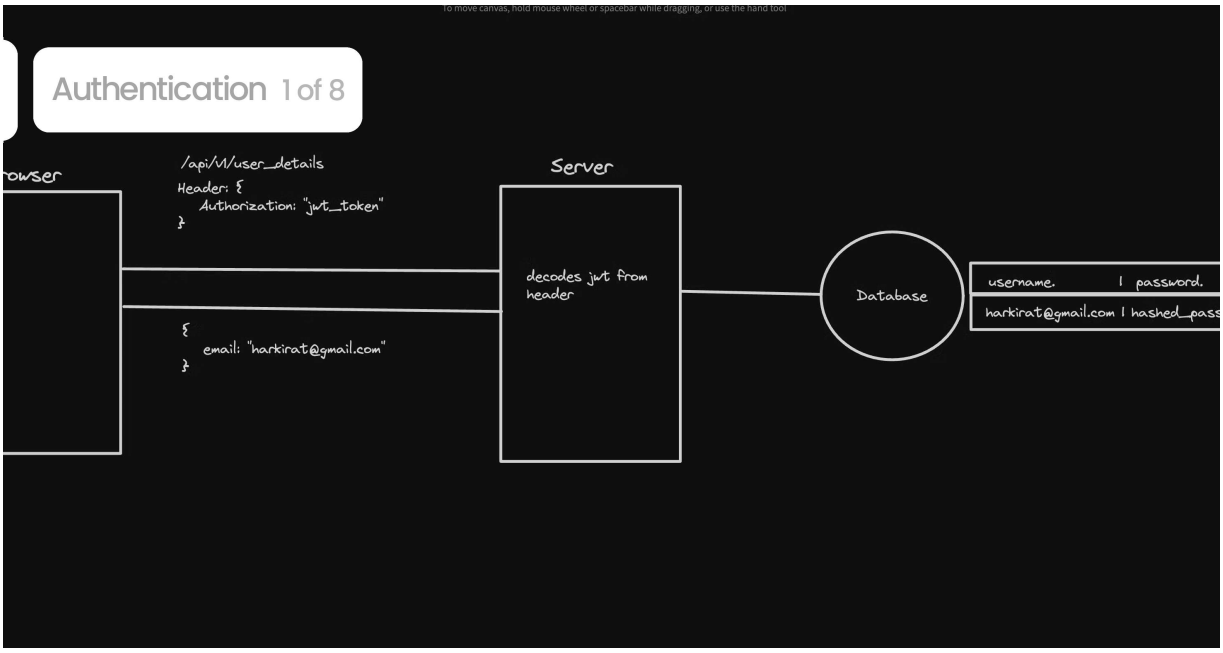
Signup



Signin



Auth requests



Authentication using cookies (Part 1)

What are cookies

Cookies in web development are small pieces of data sent from a website and stored on the user's computer by the user's web browser while the user is browsing. They are designed to be a reliable mechanism for websites to remember things (very similar to local storage)

v websites to identify users and track

their individual session states across multiple pages or visits.

Authentication 1 of 8 sites use cookies to personalize content and ads. For instance, cookies might store information about a user's preferences, allowing the site to tailor content or advertisements to those interests.

3. **Tracking:** Cookies can track users across websites, providing insights into browsing behavior. This information can be used for analytics purposes, to improve website functionality, or for advertising targeting.
4. **Security:** Secure cookies can be used to enhance the security of a website by ensuring that the transmission of information is only done over an encrypted connection, helping to prevent unauthorized access to user data.

We will be focussing on point 4

Why not local storage?

Cookies and LocalStorage both provide ways to store data on the client-side, but they serve different purposes and have different characteristics.

1. Cookies are send with every request to the website (by the browser) (you don't have to explicitly add a header to the fetch call)
   This point becomes super important in Next.js, we'll see later why

💡 Ref - https://github.com/100xdevs-cohort-2/paytm/blob/complete-solution/frontend/src/pages/SendMoney.jsx#L45

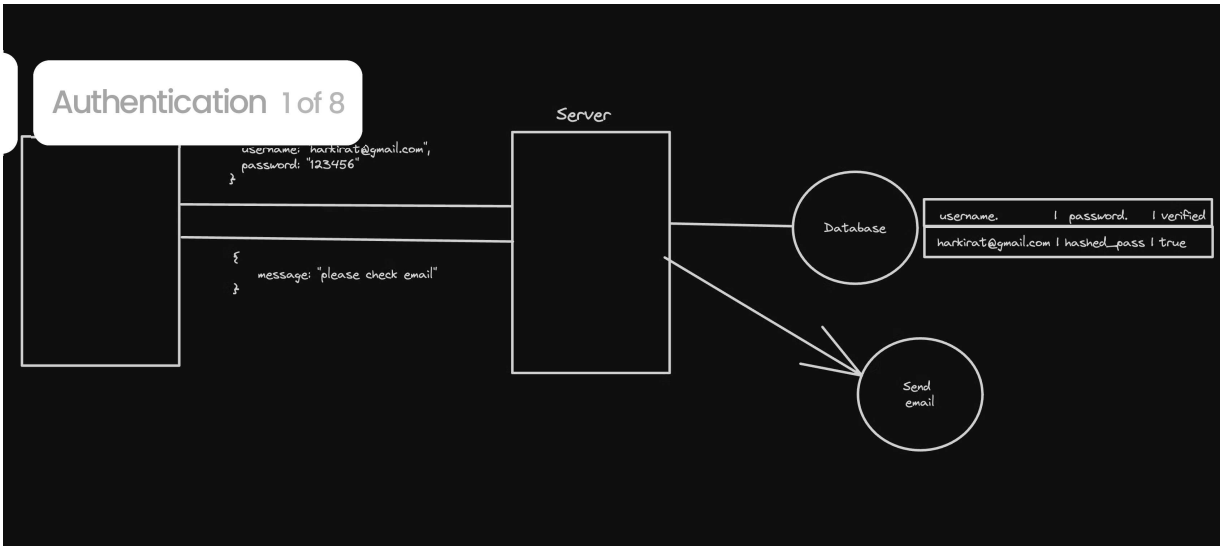
```
axios.post("http://localhost:3000/api/v1/account/transfer", {

}, {
    headers: {
        Authorization: "Bearer " + localStorage.getItem("token")
    }
})
```

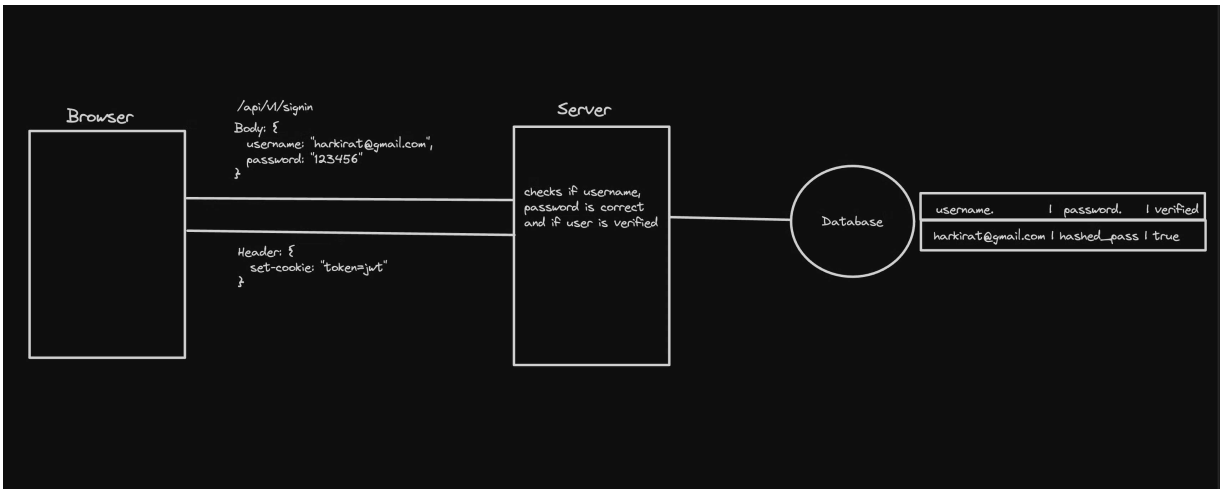

1. Cookies can have an expiry attached to them
2. Cookies can be be restricted to only https and to certain domains

Authentication with cookies (Part 2)

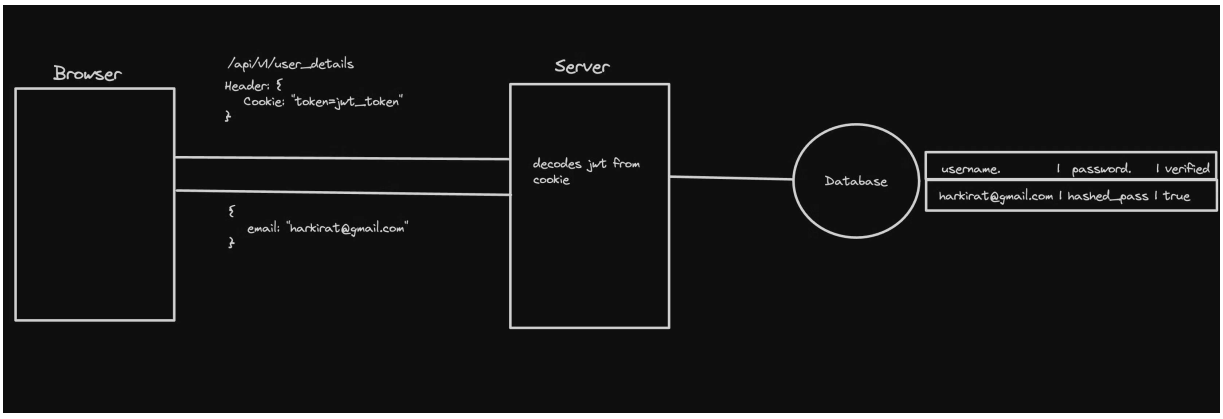
Signup



Signin



Auth endpoints



s of cookies

Types of cookies

1. Persistent - Stay even if u close the window
2. Session - Go away after the window closes
3. **Secure - S**ent only over secure, encrypted connections (HTTPS).

Properties of cookies

- HttpOnly - Can not be accessed by client side scripts
- **SameSite - Ensures cookies are not send on cross origin requests**

1. Strict
2. Lax - Only GET requests and on top level navigation
3. None

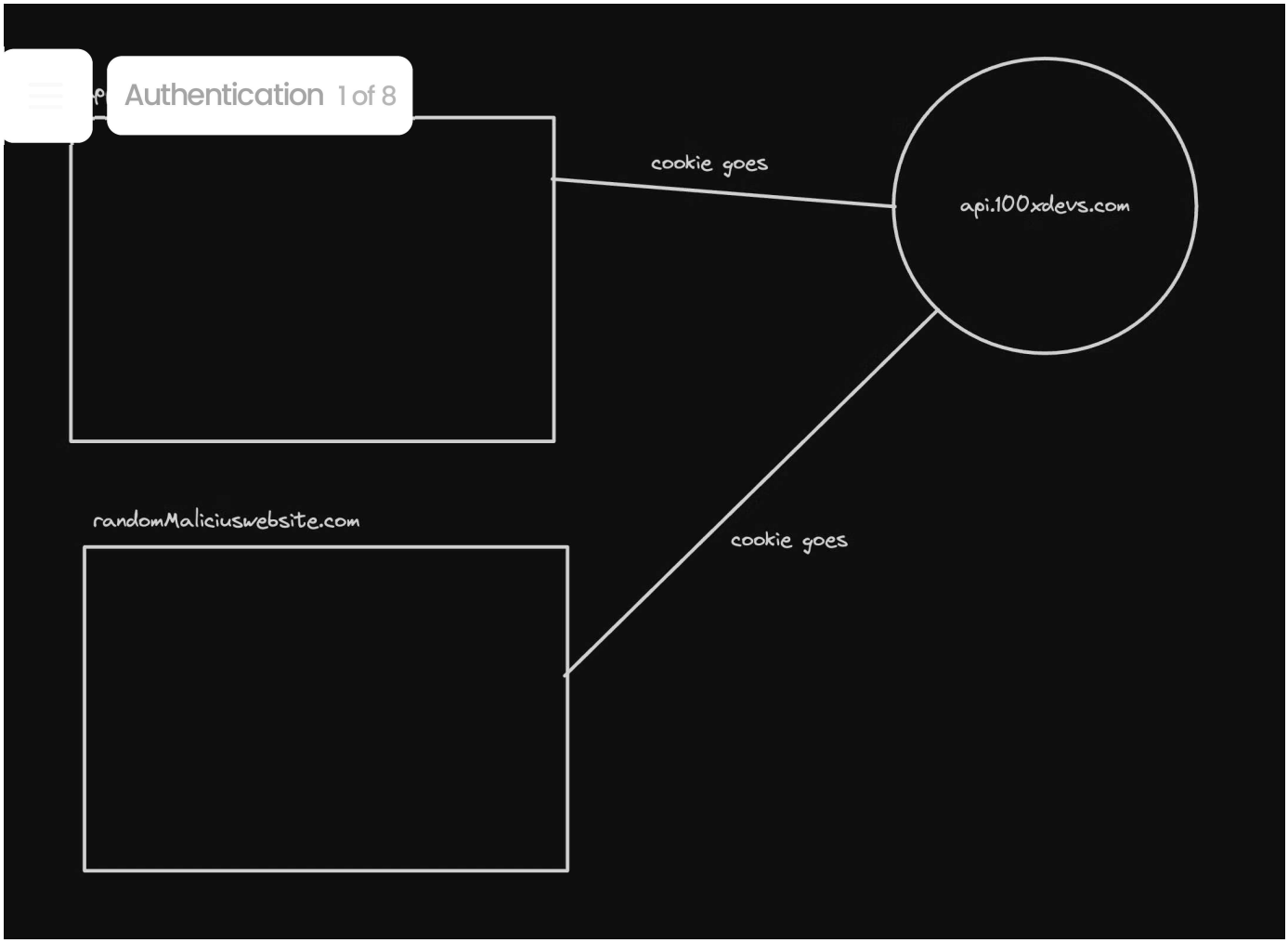
Ref - https://portswigger.net/web-security/csrf/bypassing-samesite-restrictions#:~:text=SameSite is a browser security,leaks%2C and some CORS exploits.

- **Domains** - You can also specify what all domains should the cookie be sent from

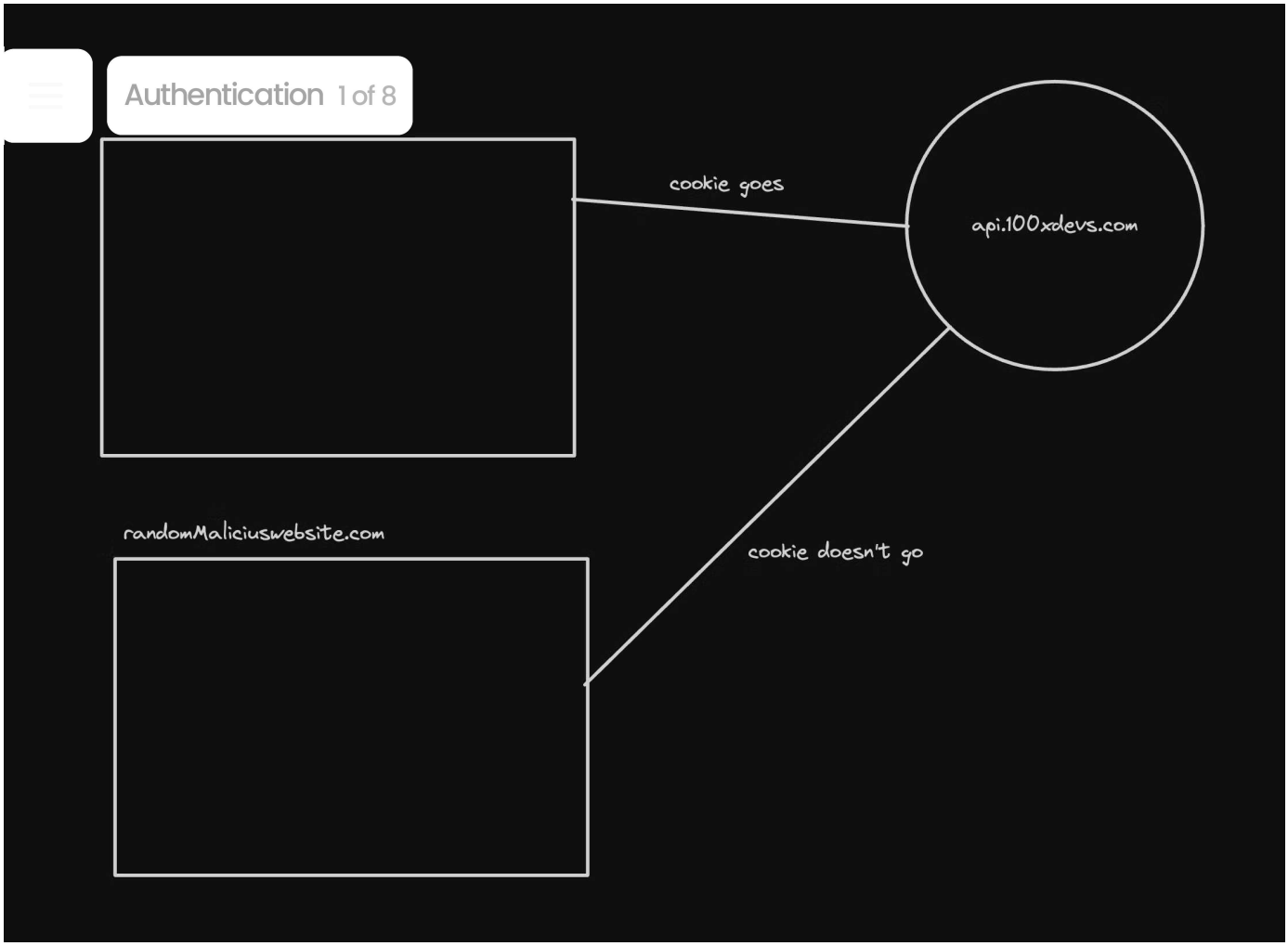
CSRF attacks

Cross site request forgery attacks were super common because of cookies and hence the SameSite attribute was introduced

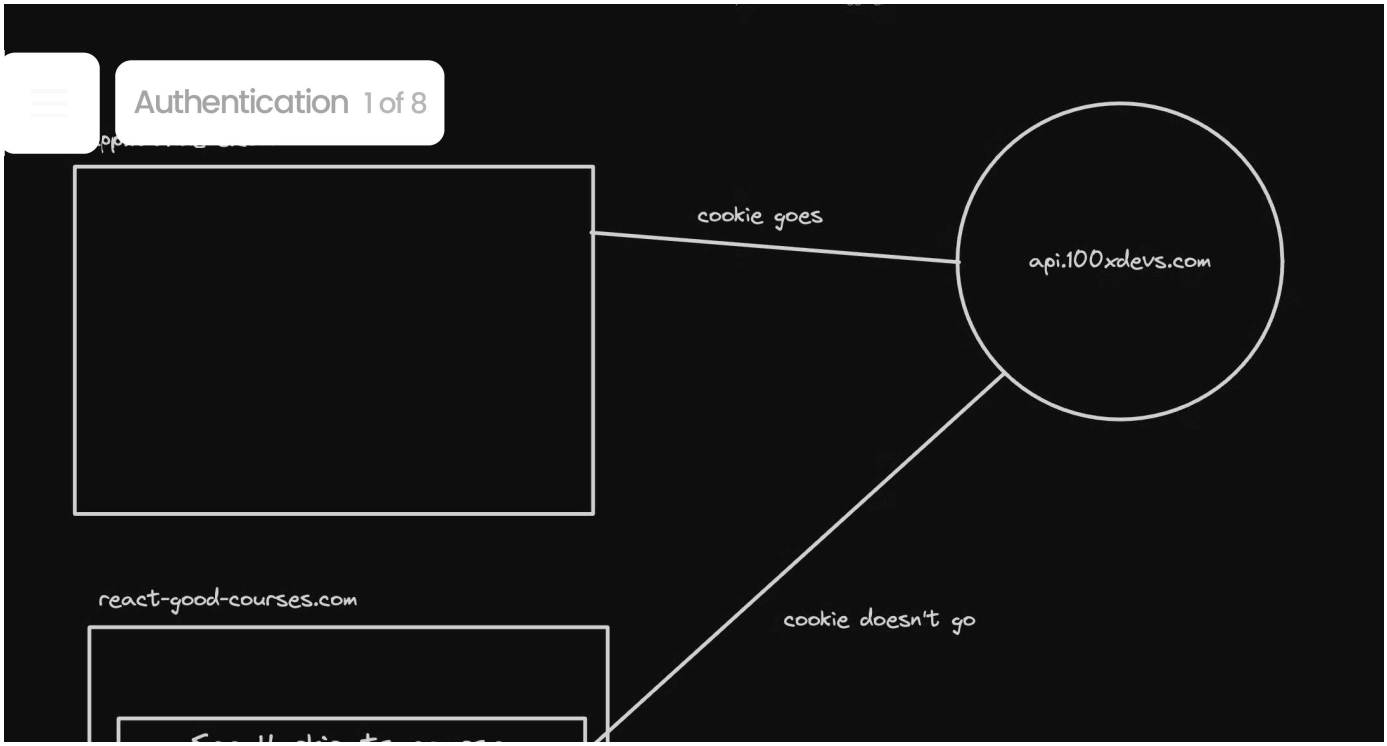
Let's see a few cases



SameSite: Strict



But there's a problem -



Example in express (Backend)

1. Initialize an empty TS project

```
npm init -y
npx tsc --init
```

1. Update rootDir and outDir

```
"roodDir": "./src"
"outDir": "./dist"
```

1. Add required libraries

```
import express from "express";
                                    er";
```

```
import jwt, { JwtPayload } from "jsonwebtoken";
ٲ                                    ١";
```

Authentication 1 of 8

1. Initialize express app, add middlewares

```
const app = express();
app.use(cookieParser());
app.use(express.json());
app.use(cors({
    credentials: true,
    origin: "http://localhost:5173"
}));
```

1. Add a dummy signin endpoint

```
app.post("/signin", (req, res) => {
    const email = req.body.email;
    const password = req.body.password;
    // do db validations, fetch id of user from db
    const token = jwt.sign({
        id: 1
    }, JWT_SECRET);
    res.cookie("token", token);
    res.send("Logged in!");
});
```

1. Add a protected backend route

```
app.get("/user", (req, res) => {
    const token = req.cookies.token;
    const decoded = jwt.verify(token, JWT_SECRET) as JwtPayload;
    // Get email of the user from the database
    res.send({
        userId: decoded.id
    })
});
```

1. Add a logout route

```
app.post("/logout", (req, res) => {
  res.cookie("token", "ads");
  res.json({
    message: "Logged out!"
  })
});
```

1. Listen on port 3000

```
app.listen(3000);
```

Code - https://github.com/100xdevs-cohort-2/week-16-auth-1

Frontend in React

- Initialize an empty react project
- Add a `signin` page

```
import { useState } from "react"
import { BACKEND_URL } from "../config"
import axios from "axios"

export const Signin = () => {
                                    eState("")
                                    State("")
```

```
    return <div>
      Authentication 1 of 8 {(e) => {
        arget.value);
      }} type="text" placeholder="username" />
      <input onChange={(e) => {
        setPassword(e.target.value);
      }} type="password" placeholder="password" />
      <button onClick={async () => {
        await axios.post(`${BACKEND_URL}/signin`, {
          username,
          password
        }, {
          withCredentials: true,
        });
        alert("you are logged in")
      }}>Submit</button>
    </div>
  }
```

- Add a user page

```
  import axios from "axios";
  import { useEffect, useState } from "react"
  import { BACKEND_URL } from "../config";

  export const User = () => {
    const [userData, setUserData] = useState();

    useEffect(() => {
      axios.get(`${BACKEND_URL}/user`, {
        withCredentials: true,
       })
        .then(res => {
          setUserData(res.data);
        })
    }, []);

    return <div>
```

```
        <button onClick={() => {
                                    CKEND_URL}/logout`, {}, {
          Authentication 1 of 8     s: true,
            })
          }}>Logout</button>
        </div>
      }
```

- Add routing

```
import './App.css'

import { BrowserRouter, Route, Routes } from "react-router-dom";
import { Signup } from './components/Signup';
import { Signin } from './components/Signin';
import { User } from './components/User';

function App() {
  return (
    <BrowserRouter>
      <Routes>
        <Route path={"/signup"} element={<Signup />} />
        <Route path={"/signin"} element={<Signin />} />
        <Route path={"/user"} element={<User />} />
      </Routes>
    </BrowserRouter>
  )
}

export default App
```

Code - https://github.com/100xdevs-cohort-2/week-16-auth-1

Authentication 1 of 8 from express

1. Add an index.html file in src folder of backend

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Login Page</title>
  <script src="https://cdn.jsdelivr.net/npm/axios/dist/axios.min.js"></script>
</head>
<body>

<input id="username" type="text" placeholder="username" />
<input id="password" type="password" placeholder="password" />
<button id="loginButton">Submit</button>
<button id="logoutButton">Logout</button>
<div id="userData"></div>


<script>

  document.getElementById('loginButton').addEventListener('click', async () =>
    const username = document.getElementById('username').value;
    const password = document.getElementById('password').value;

    try {
      await axios.post(`/signin`, {
        username,
        password
      });
      alert("You are logged in");
    } catch (error) {
      console.error('Login failed:', error);
      alert("Login failed");
```

```
ntById('logoutButton').addEventListener('click', () => {
:, {}, {
      withCredentials: true,
    }).then(() => {
      console.log('Logged out successfully.');
    }).catch(error => {
      console.error('Logout failed:', error);
    });
  });

  function fetchUserData() {
    axios.get(`/user`, {
      withCredentials: true,
    }).then(response => {
      const userData = response.data;
      displayUserData(userData);
    }).catch(error => {
      console.error('Failed to fetch user data:', error);
    });
  }

  function displayUserData(userData) {
    const userDataDiv = document.getElementById('userData');
    // Example: Assumes userData contains a 'name' and 'email'. Adapt based
    userDataDiv.innerHTML = `<p>Your id is: ${userData.userId}</p>`;
  }
  fetchUserData();
</script>

</body>
</html>
```

1. Add a route that sends this html file

```
app.get("/", (req, res) => {
  res.sendFile(path.join(__dirname, "../src/index.html"))
```

1. Remove credentials from cors

Authentication 1 of 8

```
app.use(cors());
```

Link - https://github.com/100xdevs-cohort-2/week-16-auth-1