**Collaborative Code Editor with Real-Time Sync (Google Docs for Code)**

**Overview:**

Build a **real-time collaborative code editor** where multiple users can edit the same document simultaneously. The system would synchronize code changes across multiple clients in real time using **WebSockets** and allow users to manage versions through GitHub.

**Key Components:**

* **Frontend with React.js and Monaco Editor:** Use **React.js** and the **Monaco Editor** (which powers Visual Studio Code) for the front-end interface, allowing users to edit code.
* **WebSocket Server in Node.js or Ruby:** Create a backend WebSocket server that synchronizes code changes across clients.
* **GitHub Integration:** Integrate with the **GitHub API** to allow users to commit changes and create branches directly from the editor.
* **CI/CD Pipeline:** Automate deployment to cloud services like **Azure App Service** using **GitHub Actions**.
* **User Authentication:** Allow users to authenticate via GitHub OAuth and manage access to shared projects.
* **Docker and Kubernetes for Scaling:** Containerize the app using **Docker**, and deploy on **Azure Kubernetes Service** (AKS) for scalability.

**Why It Works:**

* Emphasizes **real-time collaboration**, a complex yet valuable problem.
* Showcases GitHub integration for version control and CI/CD pipeline automation.
* Demonstrates experience with frontend frameworks like React.js and cloud services.