Project Synopsis

1. Project Title

DevOps Pipeline Simulator for CSE Students

2. Project Overview

The DevOps Pipeline Simulator is a cutting-edge educational platform designed to demystify CI/CD pipelines for students. Through intuitive visuals and interactive pop-ups, learners are guided step-by-step through the build, test, and deployment stages—experiencing the entire DevOps workflow in a safe, controlled environment. At each phase, the simulator presents every process as a popup or a clearly sequenced step, transparently revealing what actually happens behind the scenes in a real CI/CD pipeline. By showcasing real artifacts and results from authentic CI/CD executions, the simulator transforms abstract DevOps concepts into tangible, engaging, and memorable learning experiences for all skill levels.

3. Team Details

Team Number: - 06
Team Members: Prince Dayma, Neetu, Kallu Kumari
Semester: VII
Branch: Computer Science and Engineering, Institute: MBM University

3. Project Features/Modules

1. **Application Type Selector:** Students select an application type (ML Model, Mobile App, Website, etc.) via simple button clicks.
2. **Stage-wise Visual Pop-ups:** Each CI/CD pipeline stage is shown with detailed pop-ups explaining background processes step-by-step.
3. **"Learn More" Integration:** Pop-ups include "Learn More" buttons that redirect students to documentation or Wikipedia for deeper learning.
4. **Result Display:** Completed stages reveal real logs and artifacts stored beforehand by running actual CI/CD pipelines.
5. **Failure & Recovery Simulation:** Allows students to experience failure scenarios and learn troubleshooting.
6. **Environment Simulation:** Separate simulated flows for dev, test, and production environments.

4. Background Survey :

Existing CI/CD tools like GitHub Actions, Jenkins, GitLab CI, CircleCI, and TravisCI are used widely but may be overwhelming for beginners. This project provides an easy-to-understand simulation bridging the knowledge gap with modular, hands-on educational tools.

5. Proposed Technology Stack

Layer	Technologies Used	Why Used
Frontend	Next.js + Tailwind CSS	Interactive web interface, pop-ups, UI
Backend	Node.js + Express	Simulated pipeline logic & APIs
Database	MongoDB (with Mongoose ORM if needed)	Store pre-generated results/artifacts
Logging	Winston or Morgan (basic logging library)	For system and simulated pipeline logs

6. Projects Highlight of the

- Interactive stepwise pipeline visualization
- Realistic artifact presentations for hands-on understanding
- Integrated resource links for enhanced learning
- User-friendly, no coding required
- Supports multiple environments and failure simulation

7. Guided by

Dr. Alok Singh Gehlot Department of Computer Science and Engineering M.B.M University.

8. Signature of students and project guide

Signature of Guide: _____ Signature of Team Members: _____