1. An Automated Online Proctoring System for Academic Integrity Monitoring Using Computer Vision.

This is a web system that acts as an online proctoring tool for ensuring academic integrity is maintained during online exams. This system works as a background viewer where it makes use of a normal webcam to track the behavior of the test-taking individual throughout the entire testing period. The system makes use of Computer Vision technology where it first identifies the identity of the individual taking the test to ensure that the student is alone in the room. Simultaneously, it makes use of gaze tracking and head pose estimation algorithms that track where the individual is fixing his/her eyes in relation to where the computer screen is directed. In the event that the computer algorithm identifies any form of malpractice, it instantly generates flags for such malpractices in a file marked ‘Suspicion Report' for later assessment by the concerned tutor. This technology enables educational institutions to ensure that each student has a tutor for assessment security without the need for a corresponding number of human tutors due to cost effectiveness.

2.GRC LibTrack AI: A Comprehensive Library Portal featuring QR-Code Authentication withPredictive Crowding and Intelligent Book Recommendations.

The **GRC Library** currently struggles with inefficient **manual logging** and space management, making it difficult for **students and staff** to gauge availability and locate relevant course materials. This lack of real-time information leads to unnecessary congestion and frustration for users, particularly during peak hours. To address this, **GRC LibTrack AI** leverages **predictive analytics** to forecast crowding levels, allowing students to plan their visits, while implementing **QR-code authentication** for streamlined entry. Additionally, the system utilizes an **intelligent recommendation engine** to automatically suggest books tailored to a student's specific curriculum. The **expected outcome** is the effective prevention of overcrowding and a significantly enhanced user experience through data-driven accessibility and personalized resource guidance.

3. Development and Implementation of an IoT-Based Soil Parameter Monitoring and Crop Suitability Prediction System using Decision Tree Algorithm.

Many farmers and gardeners struggle because they don't know exactly what crops will grow best in their specific soil type. Often, they rely on guesswork or tradition, which can lead to wasted seeds and poor harvests if the soil conditions aren't right. Our project solves this by using a smart device with sensors that you simply stick into the ground to measure important details like moisture and temperature in real-time. This data is instantly analyzed by a "Decision Tree" algorithm, which acts like a digital agricultural expert that knows the needs of every plant. The system then recommends the specific crops that are most suitable for that exact patch of land. This eliminates the risk of trial-and-error, helping users save money and maximize their harvest without needing expensive laboratory tests.