Tools

1. **Platforms** : Google Colab(Model making using TPU/GPU), Kaggle
2. **Libraries** : Tensorflow, NumPy/Pandas, OpenCV, Keras, PyTorch, Matplotlib/Seaborn, Scikit learn, Imutils
3. **Language** : Python

AI Models

CNNs, YOLOv8 or Faster R-CNN;

Sample Plan

1. Preprocess the data (like resize, normalise, and convert into grayscale)
2. Bubble Detection after alignment through edge and corner detection using OpenCV and saving responses to respective roll numbers through mapping using CSV.
3. Need to have a flexible interface for extracting any other specific data of interest and to save custom templates for later usage.
4. Need to implement corner cases for handling incomplete or misaligned scans.
5. Optimise trained model using TensorFlow lite for mobile deployment.
6. Integrating the model into a Flutter app to process scanned images and output CSV files.
7. Tracking the model's performance and maintaining logs for detection accuracy, error rates, and processed statistics.
8. Develop dashboards to visualize this information.