1. **Motivation Behind the Project**

This project aims to replace the cumbersome routine duties of educators such as taking attendance, grading assignments, tracking student performance and planning lessons, which often consume valuable time that could be better spent on teaching, research and engaging with students. To bridge this gap, we propose the creation of a teacher assistant- Profpal. Profpal is an innovative automated teaching assistant designed to ease the workload of educators by automating key classroom tasks

# Type of Project

An AI powered Teacher’s assistant which will eliminate all the redundant tasks of teacher.

This is a **Research cum Development Project** that would eliminate the obsolete everyday processes of a teacher. In order tackle these challenges, we are proposing a complete solution which will meet which meet the above-mentioned requirements

# Critical Analysis of Research Papers and Gaps in Work

## Innovative Attendance Tracking: Facial Recognition

Explored new methods of marking attendance with maximum possible accuracy.

## 'AI- Tracker' Assistant System: A smart attendance and participation tracking system for students:

Researched about innovative methods of taking attendance and keeping track of class activity.

## Automatic answer sheet checker

## Explored about the automation of answer sheet checking and grading.

## Grade Prediction

## Explored the parameters of grading and the correlation as well as interdependency of each parameter on each other. Outweighing and strength of the factor was also researched.

## Content Creation

## Explored on how the content can be generated and how can we keep it relevant to the course, maybe by connecting it to the course outcomes of the course.

## Voice Assistance

## Researched on how to navigate through the roadmap of the website through voice commands and ensuring feature enabling by commands.

## Tools and Technologies Learned:

* + **Tools**: Firebase (for storing details of students), Postman (To test API endpoints independently to ensure the backend is functioning as expected), Node.js (To manage dependencies), HTML/CSS/JS (For frontend), MongoDB (for database), Express (For server)
  + **Frameworks**: Flask Framework (Python, for creating APIs of features), Gemini Model (AI model used for generating, refining, and expanding course outlines).

# Overall Design of the Project

* + **Activity Diagram**: Maps resource optimization and service replication processes.

# Features Built and Programming Language Used

# Features:

* Automated attendance using face recognition.
* Question bank and Answer evaluation.
* Advanced Plagiarism detection.

## Programming Languages:

* Python for backend implementation.
* HTML, CSS and JavaScript for creating frontend interfaces for the project.

1. **Proposed Methodology**
2. Develop a face attendance system that could detect and update attendance in database.
3. Implement grade prediction and content creation feature using Machine learning.
4. Develop and employs robust plagiarism detection algorithms, ensuring academic integrity.
5. Test the system for attendance, plagiarism detection, and scalability under dynamic conditions.

# Algorithm/Description of the Work

The face attendance feature makes use of face-recognition library in Python.

1. It calculates the vector distances of face features and stores them in a pickle file.
2. Upon opening the face attendance, it detects face in front of camera and matches it with the encoding stored in the pickle file.

The grade prediction feature uses machine learning concepts and various python libraries. We use a trained Linear Regression model, identified as the best fit through R² analysis, to predict grades based on assignment submission delays, class attendance, and assignment accuracy. Real-time data for these parameters is fetched from the database and processed by the model to generate individual predictions dynamically. The system ensures accurate, data-driven grade predictions while remaining adaptable for future enhancements.

# Division of Work Among Students

* + **Shivang Mishra**: Worked on the Face attendance feature and it’s integrating with Firebase. Using firebase storage feature to store the photo online. Focused on plagiarism detection and answer checker feature.
  + **Prarabdh Agarwal**: Completed the grade prediction feature after getting insights from Machine learning concepts and worked upon Frontend of the project and logic connection, and helped in integration of different features on a common platform.
  + **Vanshika Agarwal**: Worked upon content creation feature and developed server and database along with backend, and integrated the discrete features.

# Results

* + Achieved 75% accuracy in **Face attendance** using face recognition techniques.
  + Demonstrated efficient **Plagiarism Detection** among with results accurate upto 80%
  + Demonstrated **Grade prediction and content generation** using appropriate Machine learning model.

# Conclusion

This project revolutionizes classroom management by leveraging AI to automate administrative tasks like attendance, grading, and lesson planning, enabling educators to focus on student engagement and effective teaching. Seamlessly integrating with tools like Google Classroom, its intuitive interface makes it accessible to all educators while offering advanced analytics, predictive insights, and adaptive learning tools to personalize education and improve outcomes.