Minor Project Work Summary Sheet

The following question must be answered in minimum words in the summary sheet and details will be in the project report.

1. **Motivation behind the project**: It 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**. It is an innovative automated teaching assistant designed to ease the workload of educators by automating key classroom tasks.
2. **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
3. **Critical Analysis of research paper read and gaps in work and one-line summary of each paper studied** (Optional)/ Details of the new technologies, tools, and software including programming languages learned while developing the project:

## Innovative Attendance Tracking: Facial Recognition: This research paper 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.

1. **Overall design of project** :

* Frontend: HTML/CSS-based UI for managing classes, attendance, grades, and lesson plans with an interactive dashboard
* AI Features: Facial recognition for automatic attendance and grade prediction for student performance analysis.
* Backend & APIs: Flask backend with APIs for attendance, grade prediction, and lesson planning.
* Database: MongoDB stores user profiles, class details, attendance, grades, and lesson plans.
* Voice Assistance: Voice commands for hands-free task management and classroom interactions.

1. **Features build, the Programming language used** –

# Features:

* Automated attendance using face recognition.
* Assignment answer similarity.
* Grade prediction.
* Content Creation, lesson planning along with Quiz generation.
* Voice Assistance.

## Programming Languages:

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

1. **Proposed Methodology** (including complete details of how the project is completed)

* Develop a face attendance system that could detect and update attendance in database.
* Implement grade prediction using Machine learning.
* Content creation through Gemini model.
* Assignment accuracy through cosine similarity and TF-IDF concepts.
* Voice assistance using Web Speech API libraries.

1. **Algorithm/Description of the Work** –

* Vector distances of face features and storing it in pickle file. (Used for face identification)
* Linear Regression & Cosine similarity: For grade prediction and similarity checker.
* Using the Gemini model for content creation leverages its multimodal capabilities to process user prompts and refining them for creativity and precision.
* Accomplishing voice assistance with the Web Speech API enables seamless voice-to-text commands and text-to-voice responses, fostering dynamic, hands-free interaction for intelligent content creation and efficient task execution.

1. **Division of the work among students** –

* Vanshika Agarwal: Database Development, Backend and Integration.
* Prarabdh Agarwal: Features, Frontend and Backend Development.
* Shivang Mishra: Frontend development and Features.

1. **Results** –
   * + Achieved 75% accuracy in Face attendance using face recognition techniques.
     + Demonstrated efficient similarity among assignments with results accurate upto 80%.
     + Demonstrated Grade prediction and content generation using appropriate Machine learning model and AI capabilities respectively.
2. **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.