**Week 2: Initial Setup and Data Preprocessing**

**Objectives**:

* Set up the development environment.
* Implement data upload and preprocessing functionalities.

**Tasks**:

* Set up Django project and app structure.
* Implement CSV file upload functionality.
* Develop data cleaning and preprocessing scripts.
* Handle missing values and remove unwanted columns.

**Week 3: Feature Engineering and PCA Implementation**

**Objectives**:

* Implement feature engineering and PCA for dimensionality reduction.

**Tasks**:

* Apply feature scaling and transformation.
* Implement PCA to reduce dimensionality.
* Validate PCA implementation with test datasets.
* Integrate PCA results into the workflow.

**Week 4: Model Training and Evaluation**

**Objectives**:

* Implement multiple machine learning models.
* Evaluate model performance.

**Tasks**:

* Develop scripts for training various models (e.g., decision trees, random forests, SVM).
* Implement model evaluation metrics (e.g., accuracy, RMSE).
* Perform cross-validation and hyperparameter tuning.
* Compare and document model performances.

**Week 5: Ensemble Learning and Gemini AI Integration**

**Objectives**:

* Implement ensemble learning techniques.
* Integrate Gemini AI for data insights and suggestions.

**Tasks**:

* Implement ensemble methods (bagging, boosting, stacking).
* Validate and compare ensemble model performance.
* Integrate Gemini AI API for data insights.
* Display Gemini AI insights in the web application.

**Week 6: Report Generation and Frontend Development**

**Objectives**:

* Develop report generation functionalities.
* Build the frontend interface for user interaction.

**Tasks**:

* Create detailed model performance reports.
* Develop a user-friendly frontend using HTML, CSS, and JavaScript.
* Implement data visualization for insights and reports.
* Ensure responsive and intuitive UI/UX design.

**Week 7: Testing and Quality Assurance**

**Objectives**:

* Conduct thorough testing of the application.
* Ensure quality and reliability.

**Tasks**:

* Perform unit testing for individual components.
* Conduct integration testing for combined functionalities.
* Implement end-to-end testing to ensure complete workflow accuracy.
* Fix bugs and optimize performance.

**Week 8: Deployment and Final Presentation**

**Objectives**:

* Deploy the web application.
* Prepare and deliver the final presentation.

**Tasks**:

* Deploy the application on a cloud platform (e.g., AWS, Heroku).
* Conduct user acceptance testing (UAT).
* Prepare project documentation and user guides.
* Create the final presentation slides.
* Present the project to professors and stakeholders.