Screenshots of key visualizations and insights summary.

Key Features:

1. **Frontend (HTML/CSS/JS)**:
    - **Dashboard**: Displays the quiz performance overview, predicted NEET score & rank, quiz completion progress, and personalized study recommendations.
    - **Charts**: Uses `Chart.js` for visualizing the score progression over multiple quizzes, and potentially other visual insights.
    - **Personalized Recommendations**: Based on quiz accuracy, weaknesses in subjects, and overall performance trends, the system generates suggestions to improve the user's score.
2. **Backend (Python)**:
    - **Data Processing**: Loads and processes the current quiz and historical quiz data, with insights into accuracy, correct/incorrect answers, and response patterns.
    - **Performance Analysis**: Identifies weak areas, provides historical performance trends, and creates actionable recommendations based on quiz data.
    - **Rank Prediction**: Uses machine learning (Linear Regression) to predict a user's potential NEET rank based on their quiz performance, including scores, accuracy, and total questions answered.

Code Breakdown:

Frontend (HTML, JavaScript)

- The HTML structure provides the layout for displaying quiz results, charts, and recommendations.
- The `Chart.js` library visualizes score progression across five quizzes, which is dynamically updated based on quiz data.
- Personalized recommendations are created based on the user's accuracy and performance in specific subjects (e.g., physics, chemistry, and biology).
- JavaScript dynamically generates recommendations and updates the user interface with relevant data such as quiz accuracy and predicted NEET rank.

Backend (Python)

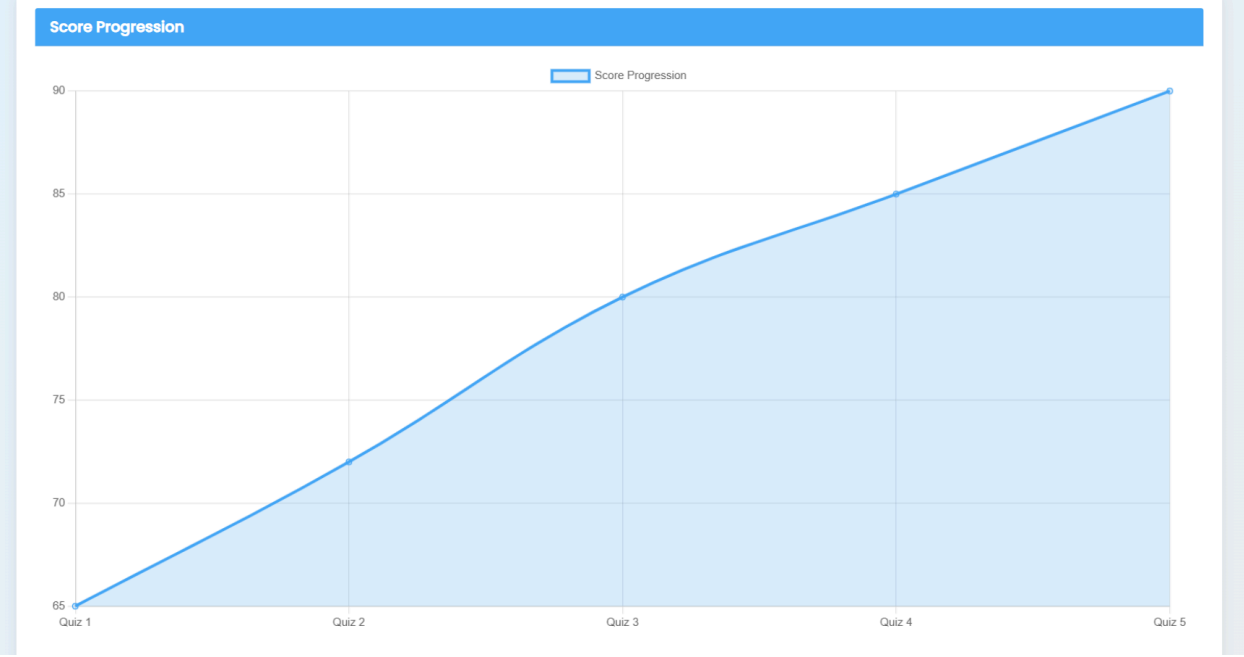
- **Data Processing**:
    - Loads JSON files containing quiz data (`current_quiz.json` and `historical_quiz.json`).
    - Converts this data into Pandas DataFrames for easy manipulation.
    - The `process_current_quiz` and `process_historical_quiz` functions prepare the data for analysis.

- **Performance Analysis**:
    - The function `analyze_performance` provides insights into current quiz performance (e.g., accuracy, correct/incorrect answers) and compares it with historical trends (e.g., average accuracy, score progression).
    - Visualizations such as score progression over time and accuracy based on difficulty levels help identify areas for improvement.
- **Rank Prediction**:
    - A simple Linear Regression model predicts the user's NEET rank based on recent quiz performance.
    - The model uses data like score, accuracy, and the total number of questions answered to predict the rank.

Key Visualizations and Insights Summary:

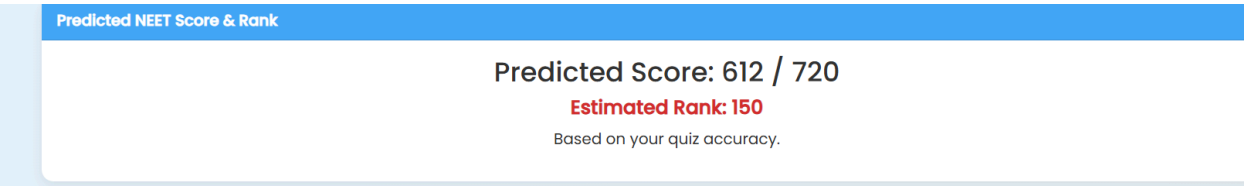
1. **Score Progression Chart**:

    - A line graph showing how the user's score has evolved over the last 5 quizzes.
    - Example visualization: A line chart with quiz numbers on the x-axis and scores on the y-axis. This helps visualize trends in performance improvement.

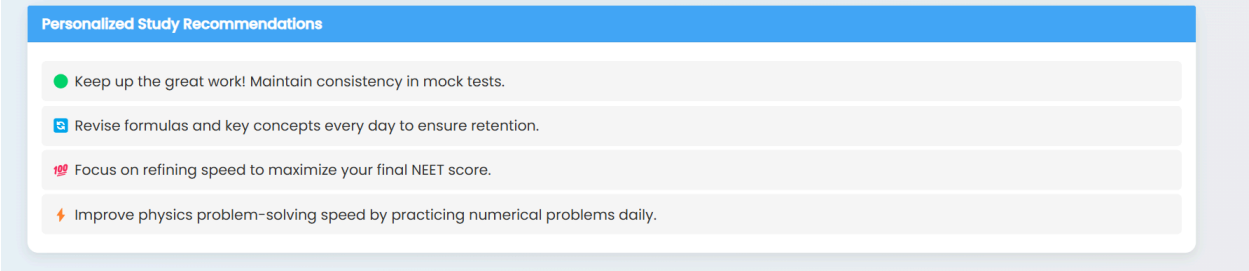


2. **NEET Rank Prediction**:

- Using the machine learning model, you can display the predicted NEET rank for the student.



3. **Personalized Recommendations**:
    - Recommendations are based on a combination of the student's quiz accuracy, weak areas, and historical performance.
    - Example suggestions could include:
        - **For low accuracy in physics**: "⚡ Improve physics problem-solving speed by practicing numerical problems daily."
        - **For overall low accuracy**: "🔴 Focus on revising key concepts from NCERT for better understanding."
        - **For high accuracy**: "🟢 Keep practicing with more difficult questions to maintain your strong performance."



Key Insights:

1. **Improvement Trends**: Track how the user's quiz performance improves over time. For example, if a user has gradually increased their score, this shows a positive trend.
2. **Weaknesses in Subjects**: Identify specific areas or subjects where the user's performance is consistently low, and provide subject-specific recommendations (e.g., for physics or chemistry).
3. **Predicted Rank**: By applying a probabilistic model like Linear Regression, you can predict a student's NEET rank and help them gauge where they stand relative to other students.