Quiz Analyzer Documentation

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Introduction

Quiz Analyzer is an interactive data analysis tool designed to evaluate quiz performance, identify strengths and weaknesses, and provide actionable insights for learners. By leveraging Python libraries, this project creates interactive visualizations that help users understand their performance metrics in a clear and engaging manner. The goal of **Quiz Analyzer** is to empower learners to improve their knowledge and skills through data-driven insights.

Features

- **Interactive Visualizations**:
  - Dynamic charts that display quiz performance by topic and difficulty level.
  - Hover effects to show detailed information about each data point, enhancing user engagement.
- **Performance Analysis**:
  - Detailed insights into strengths and weaknesses across various subjects.
  - Performance metrics such as accuracy rates, correct answers, and total questions.
- **Personalized Recommendations**:
  - Tailored suggestions for improvement based on performance data.
  - Recommendations for additional study materials and practice questions.
- **User -Friendly Interface**:

- Intuitive navigation and clear visualizations that enhance user understanding and engagement.

Technologies Used

The **Quiz Analyzer** project utilizes the following technologies:

- **Python**: The primary programming language for data analysis and visualization.
- **Plotly**: A library for creating interactive plots and charts, allowing users to explore data dynamically.
- **Pandas**: A powerful data manipulation and analysis library that simplifies data handling.
- **Matplotlib**: (Optional) A library for creating static visualizations, useful for quick visual checks.
- **Jupyter Notebook**: An interactive environment for developing and demonstrating the project, making it easy to share and collaborate.

Installation

To get started with **Quiz Analyzer**, follow these steps:

1. **Clone the repository**:

```
git clone https://github.com/yourusername/QuizAnalyzer.git
cd QuizAnalyzer
```

1. **Install the required packages**:

```
pip install plotly pandas
```

1. **(Optional)** If you want to use Jupyter Notebook:

```
pip install notebook
```

1.

2. **Verify Installation**:
   - After installation, you can verify that the packages are installed correctly by running:

```
import plotly
import pandas as pd
print("Plotly version:", plotly.__version__)
print("Pandas version:", pd.__version__)
```

1.

Usage

Preparing Your Data

1. **Data Format**: The quiz data should be structured in a JSON format. Each entry should include the following fields:
   - question_id: Unique identifier for each question.
   - topic: The subject/topic of the question.
   - difficulty: The difficulty level of the question (easy, medium, hard).
   - selected_option: The option selected by the user.
   - correct_option: The correct answer for the question.

Example JSON Structure

Here's an example of how your JSON data should look:

```json
[
    {
        "question_id": 1,
        "topic": "Math",
        "difficulty": "easy",
        "selected_option": "A",
        "correct_option": "A"
    },
    {
        "question_id": 2,
        "topic": "Science",
        "difficulty": "medium",
        "selected_option": "B",
        "correct_option": "C"
    },
    {
        "question_id": 3,
        "topic": "Math",
        "difficulty": "hard",
        "selected_option": "C",
        "correct_option": "A"
    }
]
```


Running the Analysis

1. **Load the Data**: Use the provided functions to load your quiz data into the analysis module.
2. **Perform Analysis**: Call the analysis functions to evaluate performance metrics.
3. **Generate Visualizations**: Create interactive visualizations to explore the results.

Data Format

The quiz data should be structured in a JSON format that includes the following fields:

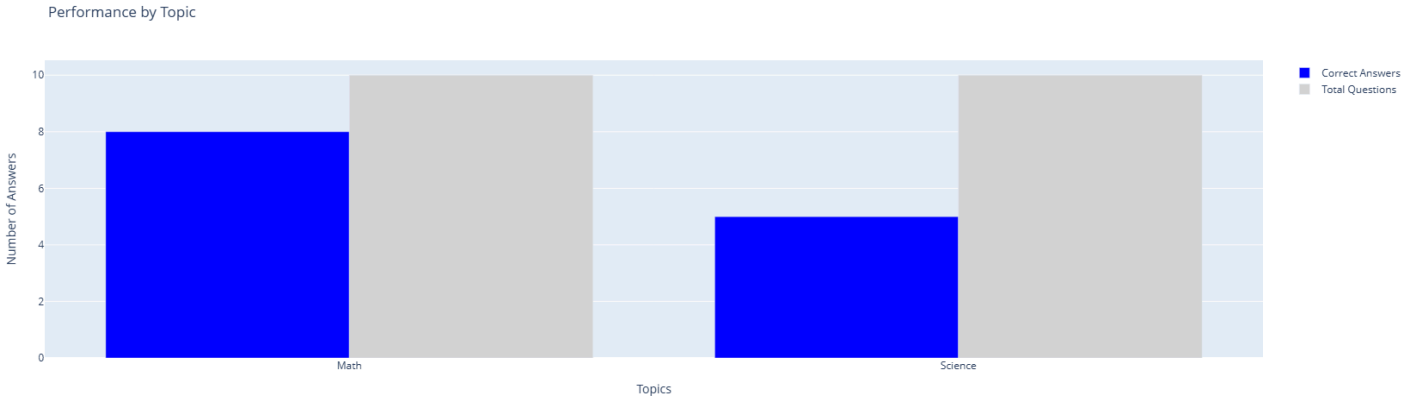
Field	Description
question_id	**Unique identifier for each question**
topic	**The subject/topic of the question**
difficulty	**The difficulty level of the question (easy, medium, hard)**
selected_option	**The option selected by the user**
correct_option	**The correct answer for the question**

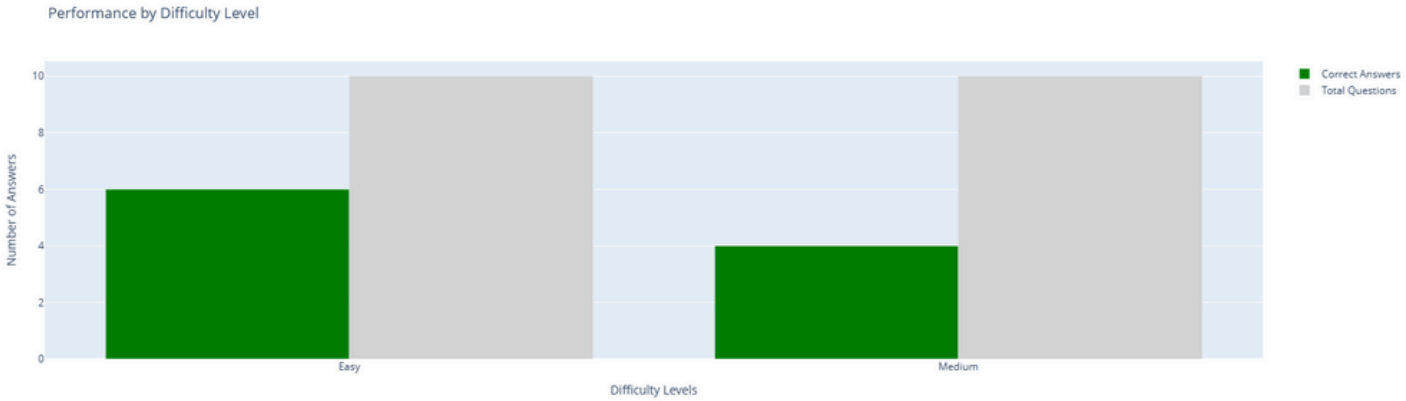
Analysis Functions

The project includes several key functions for analyzing quiz data:

- **analyze_data(current_quiz_data, historical_data_combined)**:
  - Analyzes the current quiz data against historical data to generate performance metrics.
  - Returns a dictionary containing performance insights.
- **generate_recommendations(analysis)**:
  - Provides personalized recommendations based on the analysis results.
  - Suggests areas for improvement and additional resources.
- **define_persona(analysis)**:
  - Defines a learner persona based on strengths and weaknesses identified in the analysis.
  - Helps tailor future learning strategies.

Visualization


Performance by Topic
Number of Answers
10
8
6
4
2
0
Math
Science
Topics
Correct Answers
Total Questions


Performance by Difficulty Level
Number of Answers
10
8
6
4
2
0
Easy
Medium
Difficulty Levels
Correct Answers
Total Questions