

# Academic Score Analyzer Evaluation Using Flask

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**Abstract** - In academic institutions, unit test evaluation plays an important role in assessing student performance. However, manually calculating the pass percentage and analyzing the results consumes significant time and may lead to errors. This research paper presents an Academic Score Analyzer, designed exclusively for teachers to analyze marks on Unit Test 1 (UT-1) and Unit Test 2 (UT-2). The system allows teachers to securely log in, select a subject, class, and unit test, and enter student marks. It automatically calculates the number of students passed, failed, and the overall pass percentage. The analysis is visually represented using pie charts for better understanding. Additionally, the system generates downloadable PDF reports for academic records and submission purposes. The proposed solution enhances efficiency, accuracy, and ease of academic result analysis by leveraging web technologies.

**Keywords:** Academic Score Analyzer, Unit Test Evaluation, Flask Web Application, Result Analysis, Data Visualization, Chart.js.

## I. INTRODUCTION

In higher educational institutions, continuous assessment plays a crucial role in monitoring and improving student academic performance. Unit tests are one of the most commonly used assessment methods to evaluate students' understanding of subjects during a semester. In most colleges, two unit tests are conducted, namely Unit Test 1 (UT-1) and Unit Test 2 (UT-2). These tests help teachers identify learning gaps, measure progress, and take corrective academic actions at an early stage.

Traditionally, the process of unit test evaluation involves manually entering marks, calculating the total number of students passed and failed, computing the pass percentage, and preparing reports. This manual approach requires considerable time and effort from teachers, especially when dealing with large classes. Moreover, manual calculations increase the likelihood of human errors, such as incorrect totals, flawed percentage calculations, and inconsistent records, which can impact academic decision-making.

With the increasing use of digital technologies in education, there is a strong need for automated tools that can simplify academic evaluation tasks. Automation not only reduces workload but also ensures accuracy, consistency, and faster result analysis. Additionally, a graphical representation of results can help teachers easily understand overall class performance patterns rather than relying only on numerical data.

To overcome these challenges, this research paper proposes an Academic Score Analyzer that automates unit test result evaluation and analysis. The system is designed exclusively for teachers, ensuring data security and preventing unauthorized access. Students are not permitted to enter, edit, or modify any marks, which helps maintain the integrity of academic records. Teachers can select the class, subject, and unit test type, enter marks, and instantly obtain analyzed results.

The proposed system automatically calculates the number of students passed, the number of students failed, and the overall pass percentage. Furthermore, the analysis is presented using a pie chart visualization, which provides a clear and intuitive understanding of class performance. The system also generates PDF reports that can be used for printing, documentation, and academic submission. By combining automation, data visualization, and report generation, the Academic Score Analyzer offers an efficient and reliable solution for modern academic evaluation needs.

## II. LITERATURE SURVEY

Various academic result analysis tools have been developed to manage student performance data. Traditional result processing methods mainly focus on storing marks without providing analytical insights. Some web-based applications offer digital mark entry but lack visual representation and report generation features. Recent studies emphasize the importance of data visualization techniques to analyze academic performance effectively. However, many existing systems are complex and require advanced infrastructure. The proposed system focuses on simplicity, accuracy, and usability using lightweight web technologies.

### III. PROPOSED SYSTEM

The Academic Score Analyzer is a web-based application developed for teachers to analyze unit test performance easily and accurately.

#### 3.1 System Workflow

1. The teacher logs into the system using secure credentials.
2. The teacher selects the class, subject, and unit test type (UT-1 or UT-2).
3. The teacher enters the student's marks.
4. The system automatically calculates:
  - Number of students passed.
  - Number of students who failed.
  - Pass percentage
5. The result analysis is displayed using a pie chart.
6. A PDF report is generated for printing or academic submission.

### IV. SYSTEM ARCHITECTURE

The system follows a client-server architecture. The client (frontend layer) is the part of the application that teachers interact with directly in their web browsers, responsible for displaying the user interface and visualizing analysis results. The server (backend layer) is the central computer program that handles data processing, calculations, and manages user authentication. The database layer is a structured digital storage system that saves teacher login credentials, student details, and marks entered for each unit test.

- **Backend Layer:** Processes data, performs calculations, and manages authentication.
- **Database Layer:** Stores teacher credentials, student details, and unit test marks.

### V. TECHNOLOGIES USED

#### 5.1 Frontend

- **HTML** – Structure of web pages
- **CSS** – Page styling and layout
- **Bootstrap** – Responsive and user-friendly design
- **JavaScript** – Client-side interactivity

#### 5.2 Backend

- **Python with Flask Framework** – Application logic, authentication, and processing

#### 5.3 Database

- **SQLite** – Stores teacher login details, student records, and marks

#### 5.4 Data Visualization

- **Chart.js** – Displays pass and fail analysis using pie charts

#### 5.5 Report Generation

- **Python PDF Library** – Generates downloadable unit test reports.

### VI. RESULT AND ANALYSIS

The system successfully automates unit test result evaluation. The pie chart visualization clearly represents the ratio of passed and failed students, making the analysis quick and understandable. The generated PDF reports provide structured and professional documentation of results. The system reduces manual workload and ensures accurate and reliable academic analysis.

### VII. ADVANTAGES OF THE SYSTEM

- Saves teachers' time
- Eliminates manual calculations
- Reduces human errors
- Provides graphical result analysis
- Generates printable PDF reports
- Enhances academic record management

### VIII. CONCLUSION

The Academic Score Analyzer provides an effective solution for automated unit test evaluation. By integrating data processing, visualization, and report generation, the system simplifies academic result analysis for teachers. The use of Flask, SQLite, and Chart.js makes the application lightweight, scalable, and easy to maintain. This system can be efficiently adopted in colleges to support academic evaluation processes.

### IX. FUTURE SCOPE

- Comparative analysis of multiple unit tests
- Subject-wise and class-wise performance tracking
- Export reports in Excel format
- Role-based access for administrators
- Cloud database integration

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