



BASAVARAJESWARI GROUP OF INSTITUTIONS

BALLARI INSTITUTE OF TECHNOLOGY AND MANAGEMENT



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Department of Computer Science & Engineering

Internship Training Report on

“Student Performance Analysis”

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ABSTRACT

This project focuses on developing a comprehensive student performance analysis dashboard using Power BI and Python visualizations. The system leverages cleaned student data, including academic indicators like CGPA, department, attendance percentage, and placement status, along with extracurricular parameters such as sports participation, internship experience, and mentor meeting attendance. By integrating these variables, the project aims to uncover patterns and correlations that influence student success. Key features of the dashboard include bar charts representing average CGPA across departments, scatter plots illustrating the relationship between attendance and CGPA, and cards highlighting top-performing students. Placement trends are visualized through pie and bar charts to reflect the current status and readiness of students. The project provides valuable insights to educators and administrators by enabling data-driven decision-making for academic support, training, and placement initiatives. Additionally, Python-based dashboards serve as an alternate visualization tool to support analysis beyond Power BI. Overall, this project enhances institutional ability to monitor student growth, promote engagement, and improve academic outcomes through insightful data interpretation.

INTRODUCTION

In the modern educational landscape, data plays a crucial role in monitoring and enhancing student performance. With the growing need to track not only academic outcomes but also extracurricular involvement and placement readiness, institutions require efficient tools for data analysis and visualization. This project introduces a student performance analysis system that utilizes Power BI and Python to transform raw student data into meaningful insights. The dataset comprises various fields such as CGPA, department, attendance percentage, placement status, sports participation, internship experience, and mentor meeting attendance. By visualizing this data through interactive dashboards, stakeholders can identify high achievers, monitor academic trends, and assess the impact of activities like sports and mentoring on student success. The goal is to provide a comprehensive and user-friendly tool for educators and administrators to support informed decision-making and foster an environment of continuous improvement in student development.

PROBLEM STATEMENT

“To analyze and visualize final-year student performance to identify key factors influencing placement eligibility, academic success, and internship participation using SGPA, CGPA, attendance, and backlog data.”

OBJECTIVES

- Analyze the relationship between attendance and academic performance.
- Identify the top-performing student based on CGPA.
- Compare average CGPA across different departments.
- Evaluate the impact of sports participation, internships, and mentor meetings on student success.
- Display placement status statistics to assess student readiness for the job market.
- Present all insights in an interactive and user-friendly format using Power BI and Python visualizations.

DESIGN

- **Data Collection:** Student data is gathered in Excel format, containing fields like name, department, CGPA, attendance, placement status, internships, sports participation, and mentor meeting counts.
- **Data Cleaning:** The raw data is cleaned and preprocessed to handle missing values, incorrect entries (e.g., name corrections), and ensure consistency.
- **Database Design (Optional):** For scalability, the dataset is structured into relational tables in SQL (e.g., Student, Academics, Placement, Activities, Attendance).
- **Visualization with Power BI:**
 - KPI Cards to show topper and CGPA.
 - Bar charts to compare average CGPA across departments.
 - Pie charts and bar charts for placement statistics.
 - Scatter plots to analyze attendance vs CGPA.
 - Custom visuals for sports and mentor meeting impact.
- **Python Visualization:**
 - Provides a code-based alternative to visualize the same metrics.
 - Uses matplotlib for graphs like bar charts, scatter plots, and CGPA comparison charts.

APPLICATION

- **Academic Monitoring:** Helps faculty and department heads continuously monitor students' academic progress across semesters using CGPA trends and attendance analysis.
- **Placement Readiness Assessment:** Enables the Training and Placement Cell to identify students who are eligible and ready for placements based on CGPA, internships, and placement status.
- **Early Identification of At-Risk Students:** By visualizing low attendance and CGPA, the system helps in identifying students who may need academic support or counseling.
- **Mentorship and Activity Evaluation:** Allows administrators to measure the effectiveness of mentorship programs and sports participation by analyzing their correlation with academic outcomes.
- **Data-Driven Decision Making:** Empowers school management with real-time insights for making informed decisions about student training programs, academic interventions, and resource allocation.
- **Student Feedback and Reporting:** Facilitates the generation of individual and departmental reports for review meetings, performance reviews, and parent-teacher interactions.

ADVANTAGES AND DISADVANTAGES

ADVANTAGES

1. **Data-Driven Insights:** Provides valuable and accurate insights into student performance, attendance, and placement readiness based on real data.
2. **Interactive Visualization:** Power BI dashboards are user-friendly and interactive, allowing users to filter and explore data dynamically.
3. **Topper & Placement Tracking:** Identifies top-performing students and tracks placement status effectively using KPI cards and pie/bar charts.
4. **Correlation Analysis:** Enables educators to analyze the relationship between key factors like attendance, sports participation, and CGPA.
5. **Customizable:** Easily customizable to include more fields like extracurricular achievements, behavioral data, etc.
6. **Time-Saving:** Reduces manual effort in tracking academic records and preparing performance reports.
7. **Supports Decision-Making:** Helps faculty and management make informed decisions regarding mentoring, academic support, and training programs.

DISADVANTAGES

1. **Data Dependency:** The accuracy of the analysis depends entirely on the quality and completeness of the input data.
2. **Learning Curve:** Requires basic knowledge of Power BI and data analysis, which may be a barrier for non-technical users.
3. **Static Source:** If not connected to a live database, Excel-based dashboards require frequent manual updates for new data.
4. **Limited Predictive Capability:** The dashboard shows trends and patterns but does not include predictive analytics or machine learning.
5. **Scalability Issues:** With a large number of records, performance may drop unless optimized or connected to a robust database backend.

CONCLUSION

The Student Performance Analysis Dashboard project successfully demonstrates how data visualization and analysis tools like Power BI and Python can be leveraged to gain meaningful insights into student academic and extracurricular performance. By integrating key parameters such as CGPA, attendance, placement status, sports participation, internships, and mentorship activities, the system provides a holistic view of each student's development. The interactive dashboard not only helps in identifying top performers but also assists in detecting students who may require additional academic support or guidance. It empowers faculty, placement officers, and institutional administrators to make informed, data-driven decisions aimed at improving academic outcomes and enhancing placement readiness. Overall, this project serves as a practical and scalable solution for educational institutions striving to promote excellence through smart analytics and continuous monitoring.

FIGURES

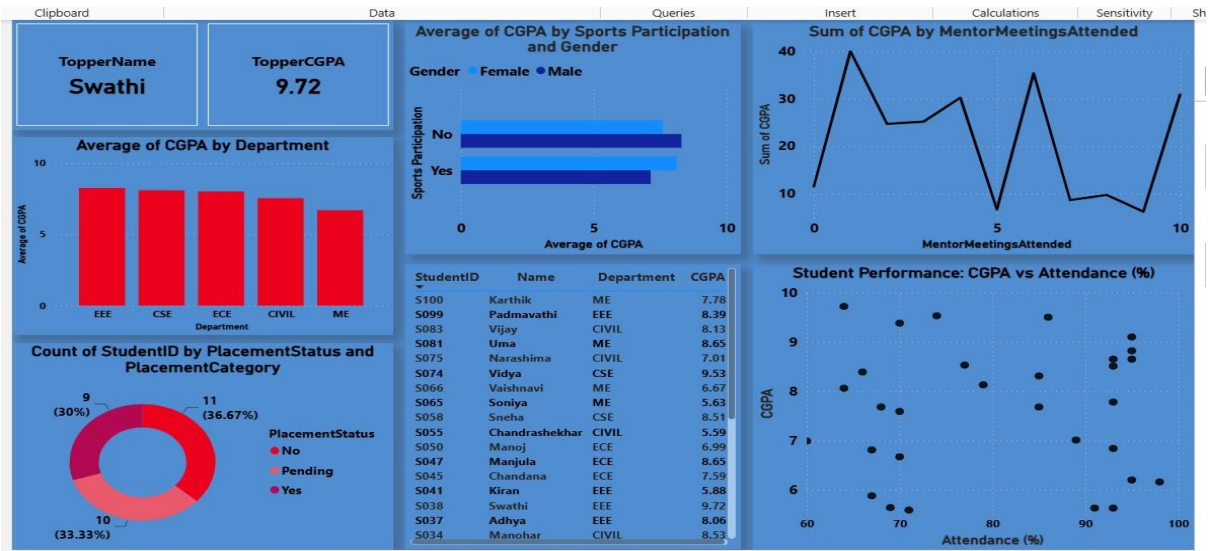


FIGURE 1:Power BI Dashboard Of Student Performance Analysis

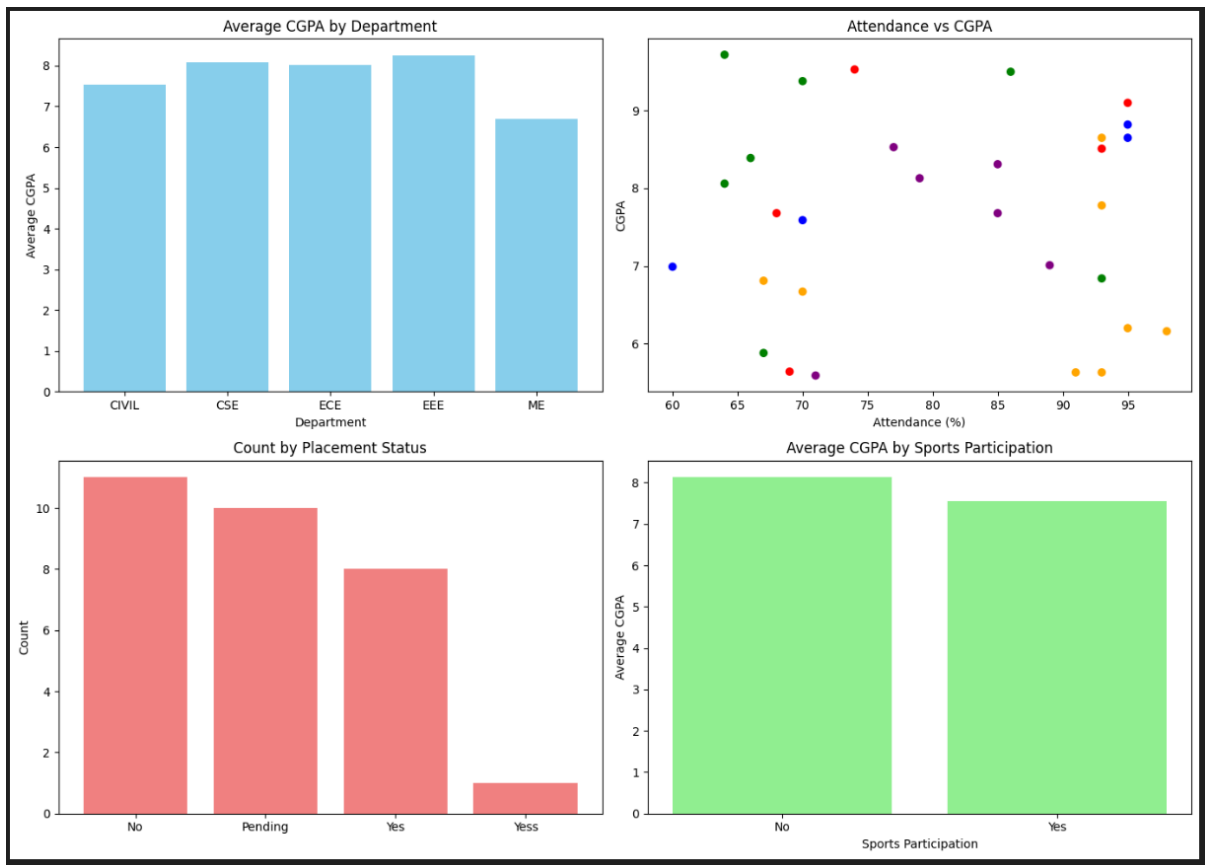


FIGURE 2: Visualization of Student Academic and Co-curricular Metrics