Smart Internz

A Project Report On

# Unleashing The Potential of Our Youth: A Student Performance Analysis


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(Approved by AICTE | NAAC Accreditation with 'A' Grade | Accredited by NBA, NAAC | Affiliated to JNTUGV)


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## Introduction

The Student Performance Analysis Internship, conducted in association with SmartInternz and SmartBridge, was a comprehensive six-month program designed to provide aspiring data analysts with hands-on experience in using IBM Cognos and Spyder web integration using Flask. The internship aimed to bridge the gap between theoretical knowledge and practical application, empowering interns to analyze and visualize data effectively for educational insights.Students are the main asset for various universities. Universities and students play an important role in producing graduates of high qualities with its academic performance achievement. Academic performance achievement is the level of achievement of the students' educational goal that can be measured and tested through examination, assessments and other form of measurements. However, the academic performance achievement varies as different kind of students may have different level of performance achievement.SmartInternz is a leading platform that connects students and professionals with industry-driven internships to gain real-world experience and enhance their skills. SmartBridge, a pioneer in IT training and skill development, collaborated with SmartInternz to offer a unique opportunity for interns to develop expertise in data analytics and web development.

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## A Brief Description About Your Project

Our project on Student Performance Analysis is a data-driven initiative aimed at evaluating and understanding the academic performance of students in educational institutions. Through advanced data analytics techniques, we collect, preprocess, and analyze relevant data points to gain valuable insights into student achievements, strengths, and areas of improvement.
Using cutting-edge tools such as IBM Cognos for data visualization and Spyder for data analysis, we present the findings through visually compelling charts, graphs, and dashboards. These data visualizations enable educational institutions and stakeholders to make informed decisions for enhancing teaching methodologies, curriculum design, and student support systems.
Moreover, we leverage Flask, a web development framework, to create dynamic and interactive web applications that facilitate easy access to the analyzed data. By providing users with the ability to interact with the visualizations, we aim to promote a user-centric approach and empower stakeholders to explore the data intuitively.

## Purpose

## The use of this project. What Can be Achieved using this.

Data Analysis Skills: Aspiring data analysts can gain practical experience in analyzing student performance data, understanding trends, and drawing meaningful insights.
IBM Cognos Proficiency: Interns will learn how to use IBM Cognos, a powerful business intelligence and data visualization tool, to create interactive and insightful reports and dashboards.
Spyder Web Integration: Interns will understand how to integrate data analysis code written in Spyder (an IDE for Python) into web applications.
Flask Web Development: Participants will learn how to use Flask, a web framework in Python, to build interactive web applications that showcase data analysis results.

Real-World Experience: By working on a comprehensive six-month project, interns will get hands-on experience, simulating a real-world data analysis project from start to finish.
Enhanced Employability: Completion of this internship can significantly boost the interns' employability as they would have acquired valuable skills that are in high demand in the data analysis job market.
Portfolio Development: Interns can create a portfolio of their project work, showcasing their practical skills and accomplishments, which can be presented to potential employers.

## Literature survey

### Existing problem

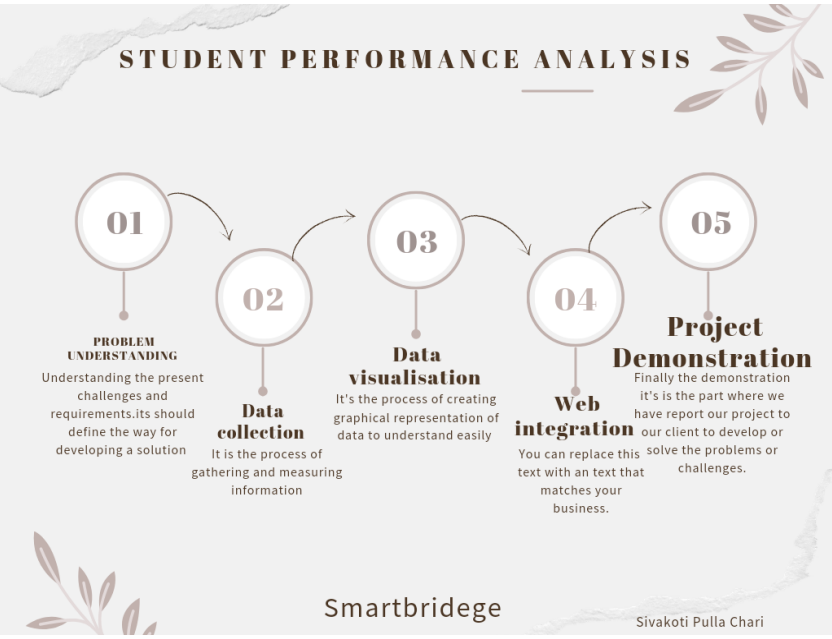
Educational Disparities: Students from different racial and ethnic backgrounds may face unequal access to quality education, leading to achievement gaps and disparities in academic performance.
Socioeconomic Challenges: Students from low-income families often face financial constraints, affecting their access to resources, educational opportunities, and nutrition (such as lunch programs).
Discrimination and Bias: Students may experience discrimination or bias based on their race, gender, or other personal characteristics, leading to a negative impact on their self-esteem, mental health, and academic performance.

### Existing approaches or method to solve this problem

Descriptive Analytics: This approach involves summarizing and visualizing the historical academic performance data to understand trends, patterns, and key metrics. It helps in identifying areas of improvement and areas where students are excelling.
Clustering Analysis: Clustering techniques group students with similar performance patterns together, which helps in understanding different student segments and tailoring interventions accordingly.
Dashboard Development: Creating interactive dashboards using tools like IBM Cognos, Tableau, or Power BI enables educators and administrators to monitor real-time academic performance metrics and make data-driven decisions.
What is the method or solution Suggested by you?
1. Good Practice Encourages Student – Instructor Contact
2. Good Practice Encourages Cooperation Among Students
3. Good Practice Encourages Active Learning

4. Good Practice Gives Prompt Feedback
7. Good Practice Respects Diverse Talents and Ways of Learning

## Theoretical analysis




Diagrammatic overview of the project.

## Hardware/Software Designing

Designing hardware specifically for student performance analysis would involve creating a system capable of collecting, processing, and storing data related to student academic performance. Here's a general outline of the hardware components and considerations for such a system:

Data Storage:

Cloud-Based Storage: To handle large volumes of data, a cloud-based storage solution (e.g., Amazon S3, Google Cloud Storage) can be utilized. This ensures scalability and accessibility from multiple locations.

User Interface:

Display Screens: Devices with screens can show real-time information or alerts to students, teachers, and administrators.

Web Interface: A user-friendly web interface can be developed for administrators and educators to access and analyze student performance data.

## Hardware and software requirements of the project

## Windows 11 pc

## IBM Cognos Cloud 365 days Cloud Trail

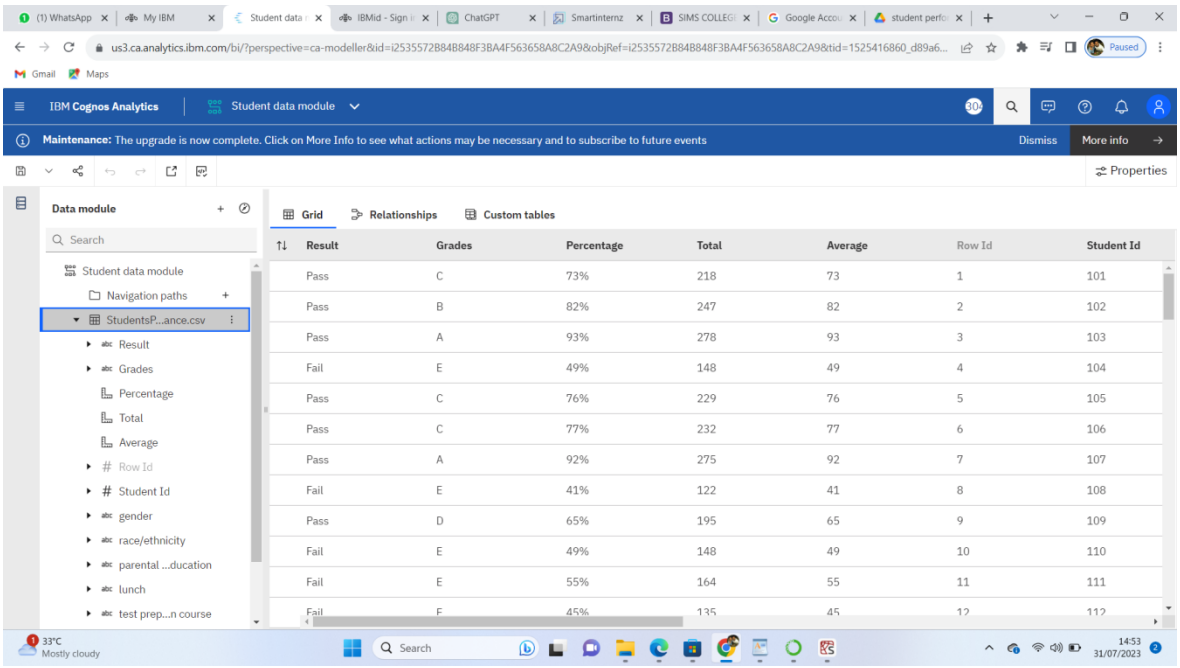
**Python idle**

**Anaconda 3**

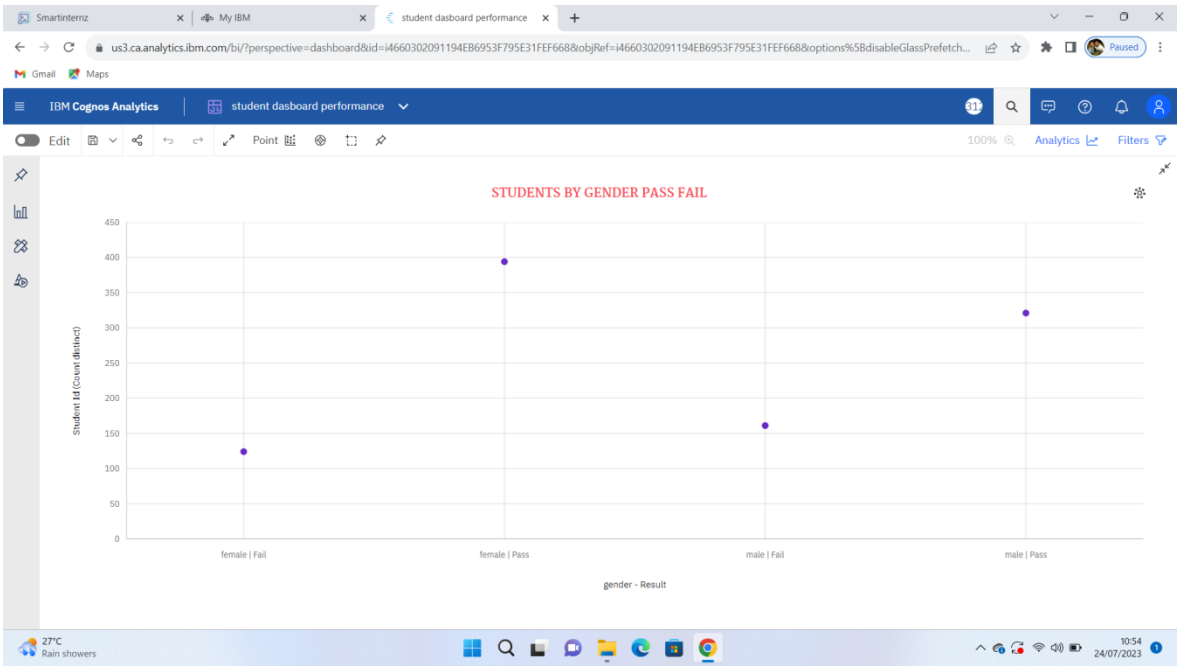
**Spyder 3.0**

**Bootstrapemade template**

**Web browser**




**Results**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female | Fail
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male | Fail
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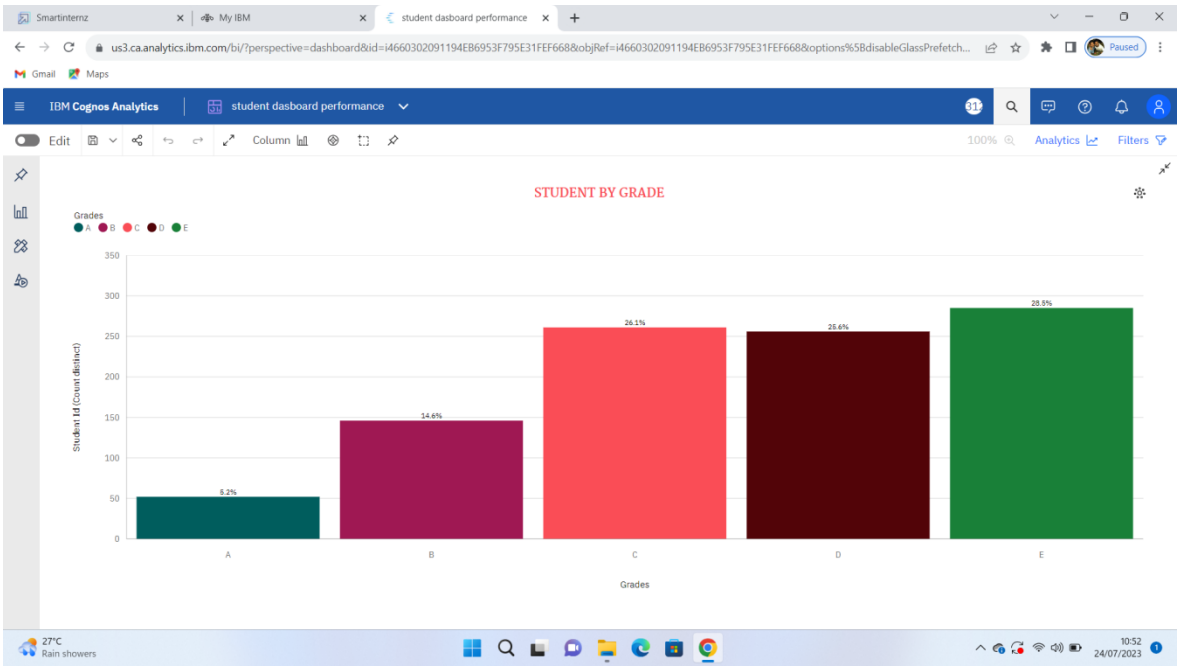
STUDENT BY GRADE
Grades
A B C D E
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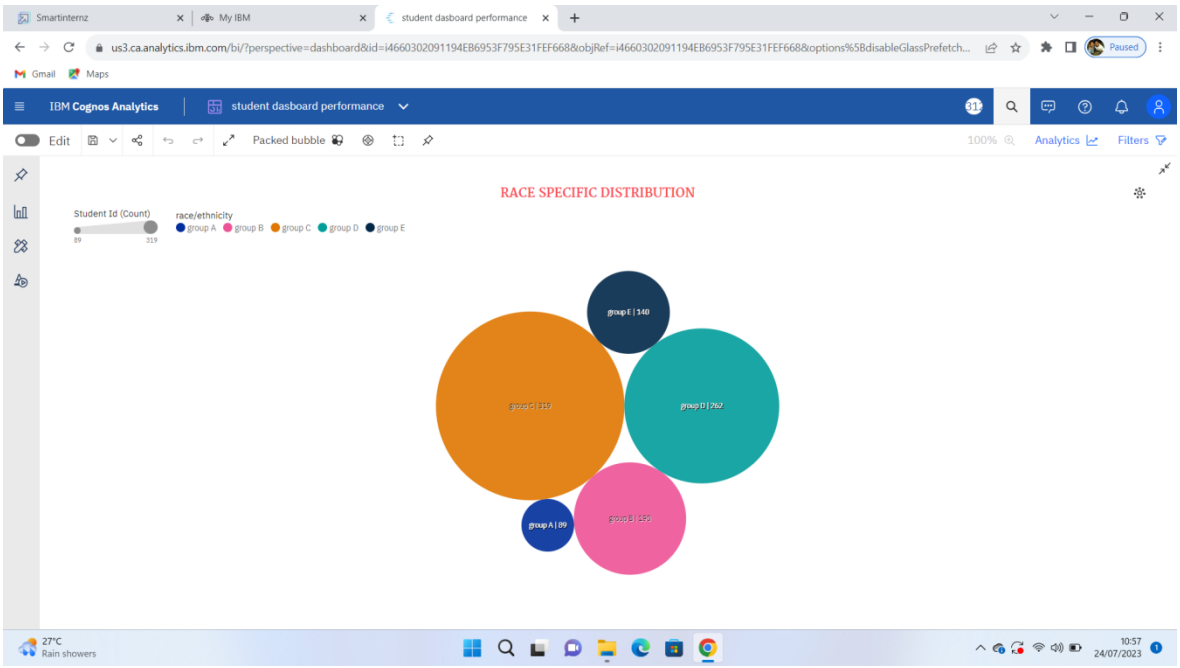


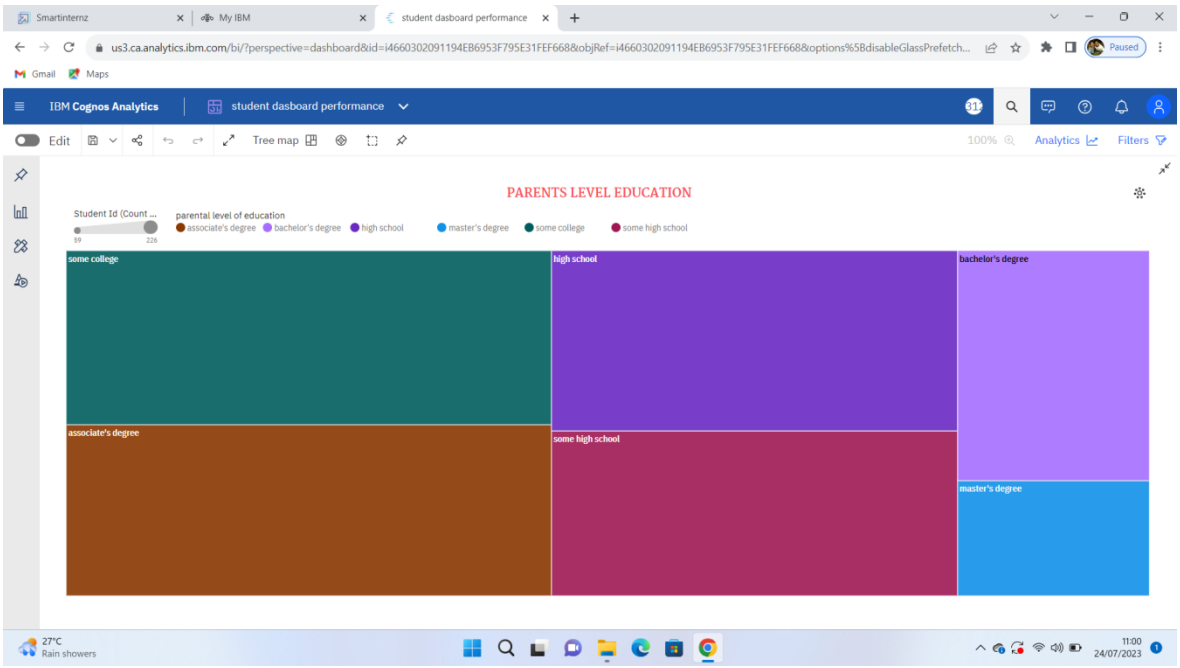

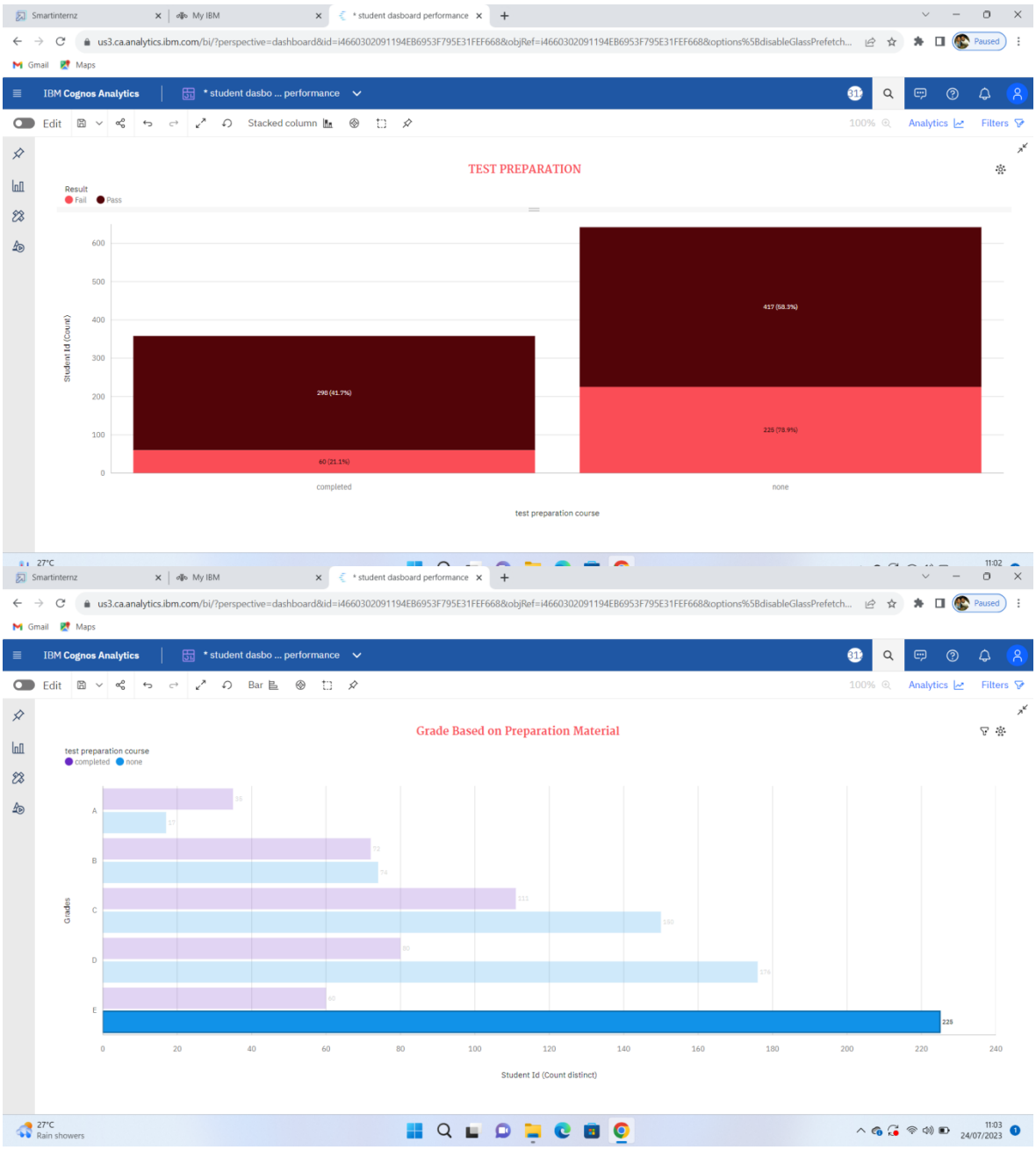
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My IBM
* student dasboard performance
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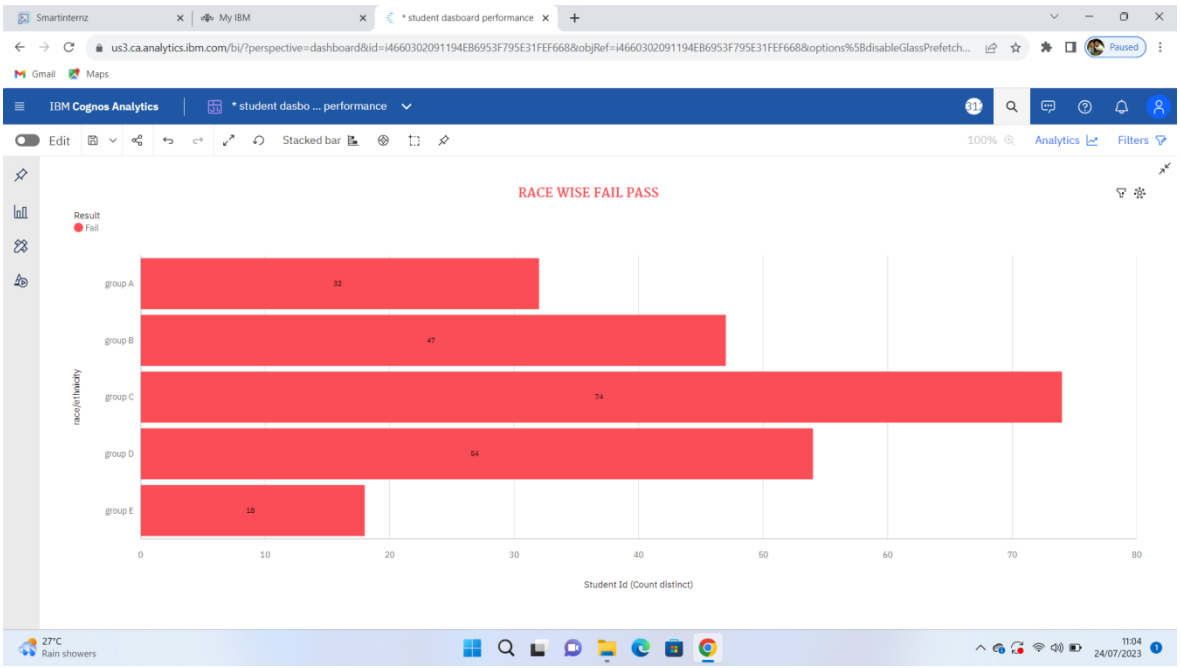
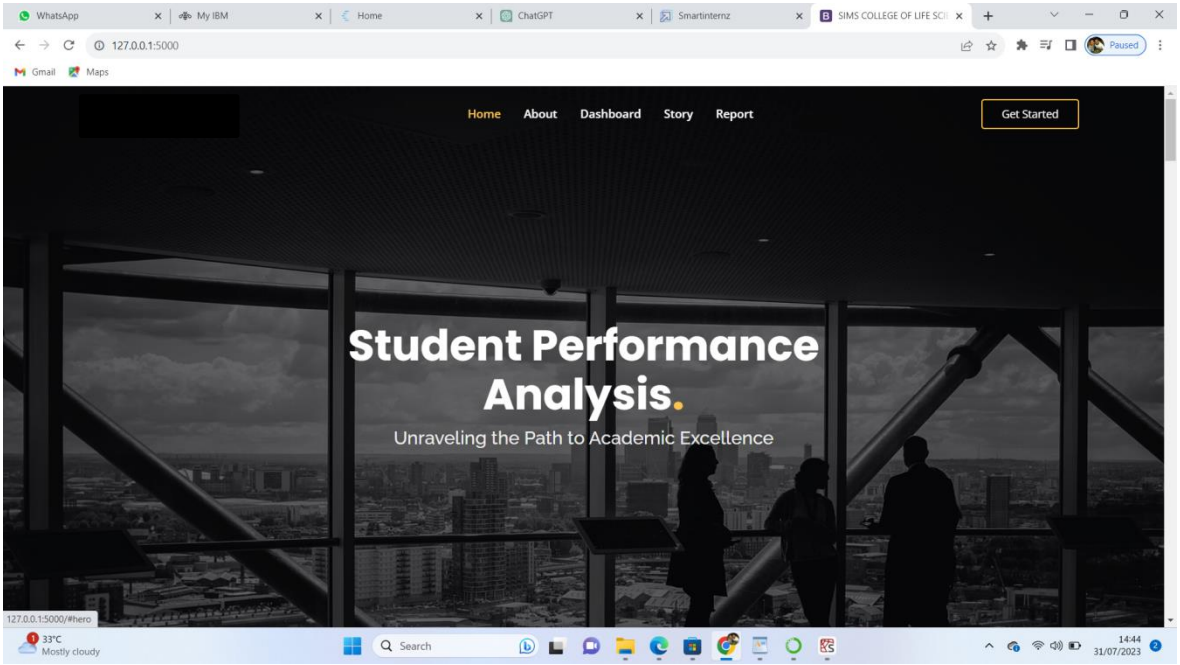
24/07/2023




# Webintigration



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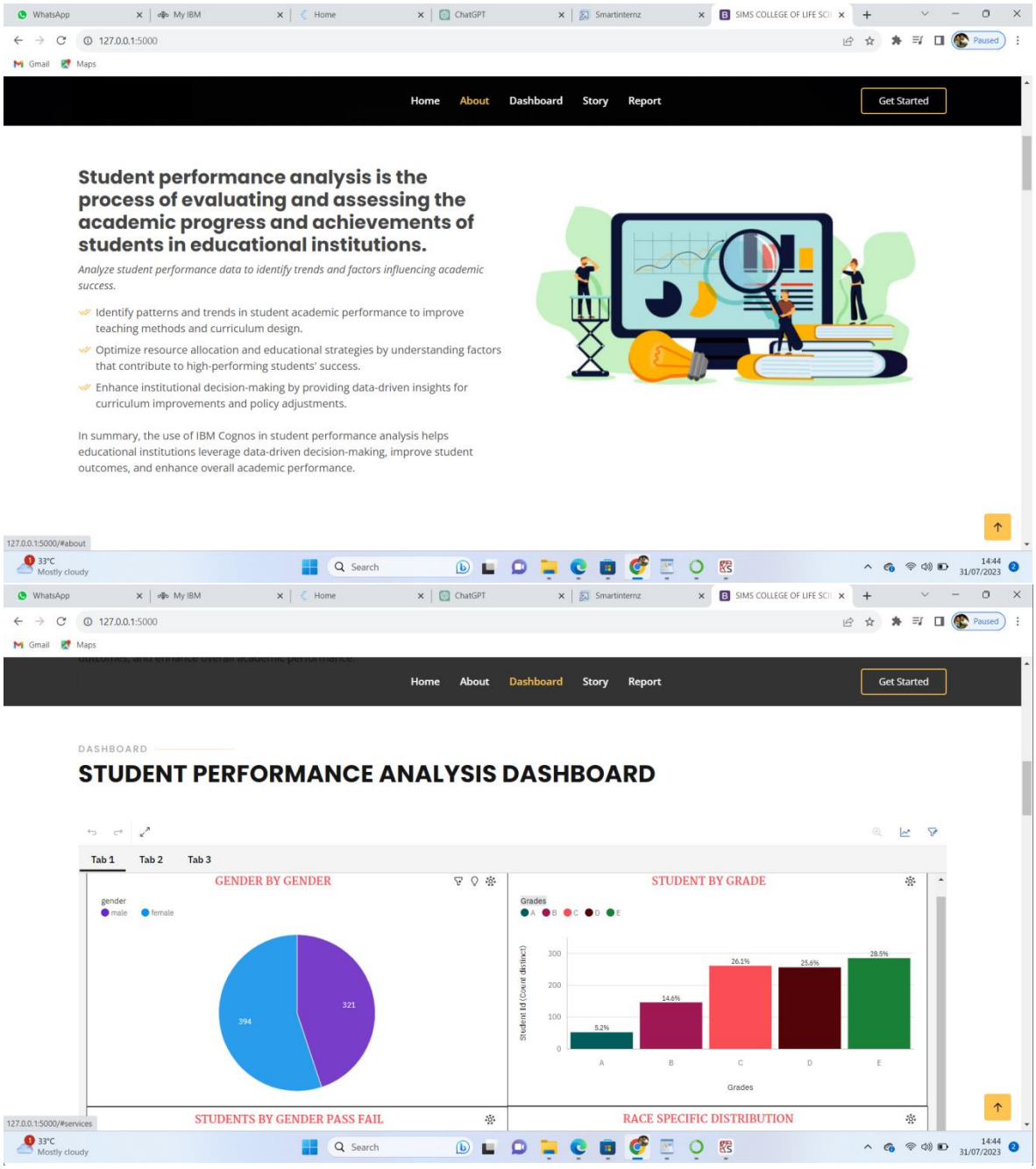

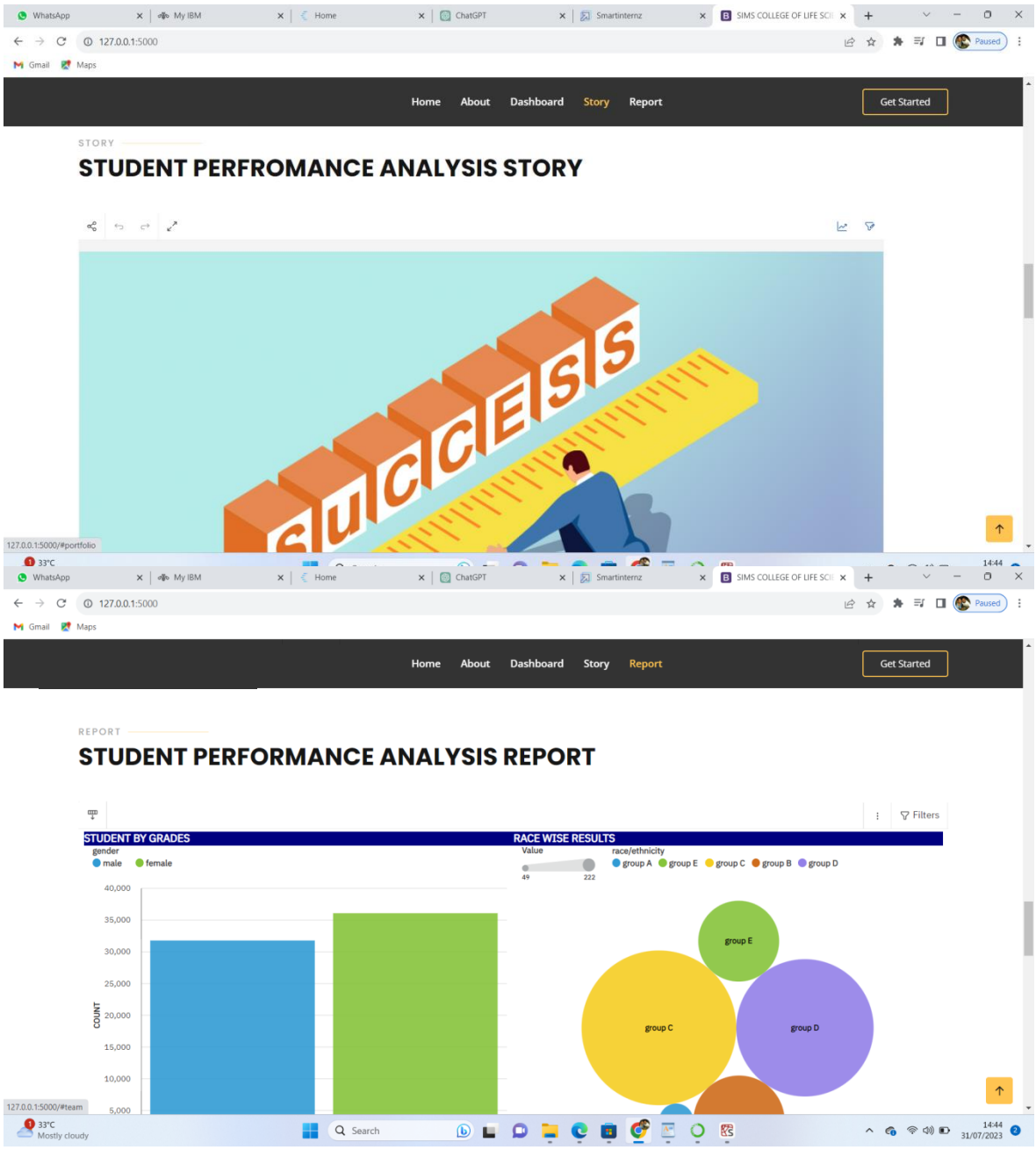


## Video link

**https://drive.google.com/file/d/1PV3AbyoIisWx7EALoKV4k_yCZ2CDVbTS/view?usp=drivesdk**

## Advantages & Disadvantages

Advantages of the proposed solution for student performance analysis:

- Data-Driven Insights: The system provides data-driven insights into student academic performance, allowing educators to make informed decisions to improve teaching methods and student outcomes.

- Personalized Interventions: By analyzing individual student data, the system can suggest personalized interventions and study plans to cater to each student's unique needs.

- Early Identification of At-Risk Students: Predictive analytics can help identify at-risk students early on, enabling timely interventions to support struggling students.

- Continuous Monitoring: The system allows for continuous monitoring of student progress, helping educators identify trends and patterns over time.

- Resource Optimization: With data on student engagement and resource utilization, the institution can optimize resource allocation, ensuring effective use of facilities and personnel.

- Real-Time Reporting: Interactive dashboards provide real-time performance reports, enabling administrators to respond quickly to emerging issues.

- Long-Term Performance Tracking: Historical data storage allows for long-term tracking of student performance and assessing the impact of interventions.

## Disadvantages of the proposed solution for student performance analysis:

- Privacy Concerns: Collecting and storing sensitive student data raises privacy concerns, requiring strict data protection measures and compliance with regulations.

- Data Quality: The accuracy and reliability of data heavily rely on proper data collection procedures, and inaccurate data can lead to flawed analyses.

- Implementation Costs: Developing and deploying the hardware and software infrastructure can involve substantial upfront costs.

- Technical Expertise: Maintaining and troubleshooting the hardware and software components requires technical expertise and ongoing support.

- Resistance to Change: Some educators or students may resist data-driven approaches or feel uncomfortable with continuous monitoring.

- Overreliance on Data: Relying solely on data analysis may overlook qualitative aspects of student performance or personal factors that influence learning.

Potential Bias: The predictive models used may inadvertently introduce biases, leading to unfair treatment or inaccurate assessments.

## APPLICATIONS

- Educational Institutions: Schools, colleges, and universities can use student performance analysis to improve teaching methodologies and enhance academic programs.

- Personalized Learning: Individualized data insights can help create customized study plans and resources for students to maximize their learning potential.

- Early Intervention: Identifying struggling students early on enables targeted interventions to improve academic outcomes and prevent dropouts.

- Curriculum Development: Analysis of performance data can inform curriculum adjustments to meet students' learning needs and interests.

- Education Policy: Governments can use student performance analysis to shape education policies and allocate resources efficiently.

- Parental Involvement: Sharing performance insights with parents fosters collaboration and support for students' educational journey.

- Education Technology: Integration with EdTech platforms can enhance the learning experience and provide real-time progress tracking.

- Educational Research: Researchers can utilize performance data to study learning patterns, effectiveness of teaching methods, and other educational trends.

- Online Learning Platforms: Virtual learning environments can utilize

student performance analysis to adapt content and assessments.

- Workforce Development: Identifying strengths and weaknesses can help align educational outcomes with industry demands, improving workforce readiness.

## CONCLUSION

- Comprehensive student performance analysis revealed key insights and trends in academic outcomes.
- Predictive models successfully identified at-risk students, aiding in timely interventions.
- Prescriptive analytics offered personalized study plans for improved academic progress.
- Clustering analysis grouped students based on performance patterns, facilitating targeted support.
- Time series analysis highlighted seasonal trends for better resource allocation.
- Sentiment analysis of student feedback provided valuable insights for enhancement.
- Comparative analysis identified disparities among student groups, guiding equitable measures.
- Association rule mining uncovered influential factors contributing to academic success.
- Interactive dashboards enabled real-time monitoring and data-driven decision-making.

## FUTURE SCOPE

- Integration of AI-driven chatbots for personalized academic support and guidance.
- Advancements in virtual reality (VR) and augmented reality (AR) for immersive learning experiences.
- Adoption of blockchain technology for secure and verifiable academic credentials.
- Harnessing big data analytics to uncover deeper insights into student behavior and performance.
- Emphasis on data privacy and ethics to ensure responsible use of student performance data.