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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

DATA MINING AND ANALYTICS

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MINI PROJECT

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INTRODUCTION

In today's digital world, mobile notifications have become an integral part of students' daily lives. However, frequent interruptions may significantly affect their ability to focus and perform academically. This project aims to analyze how mobile notifications influence student concentration and test performance.

A dataset of 40 students was collected, including attributes such as sleep hours, study hours, coffee intake, number of notifications per hour, and study location. Using **R programming**, various analyses such as correlation, data visualization, and linear regression were performed. The main goal was to identify which lifestyle and environmental factors most strongly affect student focus and outcomes.

METHODOLOGY

Data Collection

Data was collected from 40 undergraduate students through a structured Google Form. Each record represents a student's daily habits, study environment, and performance metrics. The dataset was stored in a CSV file for processing in RStudio.

Data Preprocessing

Before analysis, the data was cleaned and prepared:

- Converted categorical variables such as *Gender*, *Year of Study*, and *Study Location* into factors.
- Checked for missing values (none were found).
- Verified all numerical attributes like *Sleep Hours* and *Notifications per Hour* were properly formatted.

Exploratory Data Analysis (EDA)

EDA was performed using the **ggplot2** package in R. Key analyses included:

- Correlation between notifications and concentration levels.
- Comparison of concentration by study location (Room vs Library).
- Visualization using scatter plots and boxplots to observe behavioral trends.

Regression Modeling

A **multiple linear regression** model was developed to predict *Test Score* using the following variables:

- Sleep Hours
- Study Hours
- Notifications per Hour
- Cups of Coffee
- Study Location

This model helped quantify how each factor contributed to academic performance.

RESULT AND ANALYSIS

Correlation Analysis

A correlation coefficient of **-0.786** was found between *Notifications per Hour* and *Concentration Score*, indicating a strong negative relationship.
This means that as mobile notifications increase, concentration levels tend to decrease.

Study Environment

Students who studied in the **Library** showed higher average concentration and test scores compared to those studying in their **Rooms**. This highlights the importance of a distraction-free environment.

Regression Results

The regression analysis showed:

- **Sleep Hours** and **Study Hours** have a **positive significant effect** on performance.
- **Notifications per Hour** has a **negative significant impact** ($p < 0.001$).
- **Coffee intake** and **Study Location** showed minor or insignificant effects.
  The model achieved an **R^2 value of 0.6438**, meaning it explains about **64% of the variation** in test scores.

Interpretation

Students who maintain consistent sleep and study schedules perform better academically, while frequent notifications lower their concentration and grades. Coffee showed minimal effect, meaning alertness alone cannot compensate for distraction.

CONCLUSION

Based on the analysis, it is evident that **mobile notifications negatively impact student focus and academic performance**. Students studying in quieter environments like libraries demonstrated higher concentration and better results. Adequate **sleep (6–8 hours)** and consistent **study routines** contribute positively to academic success.

The study highlights the need for students to **manage digital distractions**, adopt healthy study habits, and ensure sufficient rest for optimal performance.