

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY“JNANA  
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**ASSIGNMENT – 1**

**REPORT ON  
“STUDENT PERFORMANCE FACTOR”**

*Submitted by*

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*In partial fulfillment of the requirements for the II semester*

**BACHELOR OF ENGINEERING**

**in**

**COMPUTER SCIENCE & ENGINEERING (DATA SCIENCE)**

*Under the Guidance of*

**Faculty Name**

Designation,

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at



**SAHYADRI**  
COLLEGE OF ENGINEERING & MANAGEMENT  
An Autonomous Institution  
MANGALURU

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# **Assignment Title: *Visualising Social Change: Raising Awareness and Promoting Action***

## **Topic: *Student Performance Factors***

### **Objective:**

The goal of this report is to explore various factors influencing student performance and create visualizations to raise awareness about how different aspects, such as study habits, parental involvement, and socioeconomic status, affect academic outcomes. This information can guide stakeholders like educators, policymakers, and parents to take actions that support student success.

### **Introduction:**

Student performance is influenced by numerous internal and external factors, including personal study habits, school environment, family background, and socioeconomic conditions. Understanding these factors is critical for improving educational outcomes and ensuring that students have the support they need to succeed.

In today's competitive environment, academic performance is a primary concern for students and educators alike. Studies show that factors such as parental involvement, access to resources, and extracurricular activities play a significant role in shaping student outcomes. Data-driven insights from educational research can help identify the most impactful factors and enable targeted interventions.

As educational institutions strive to improve learning outcomes, understanding the factors influencing student performance is critical. This knowledge allows for the development of personalized learning plans and policies to ensure that all students can achieve their full potential. Visualizing these factors helps make complex data more accessible and actionable, thereby promoting awareness among stakeholders like educators, parents, and policymakers.

Visualization makes it easier to grasp the relationships between different variables and their influence on student outcomes. For example, seeing the correlation between hours studied and exam scores or the impact of family income can highlight actionable insights for improving academic achievement.

### **Visualizations and Recommendations:**

#### **1. Correlation Between Hours Studied and Exam Score**

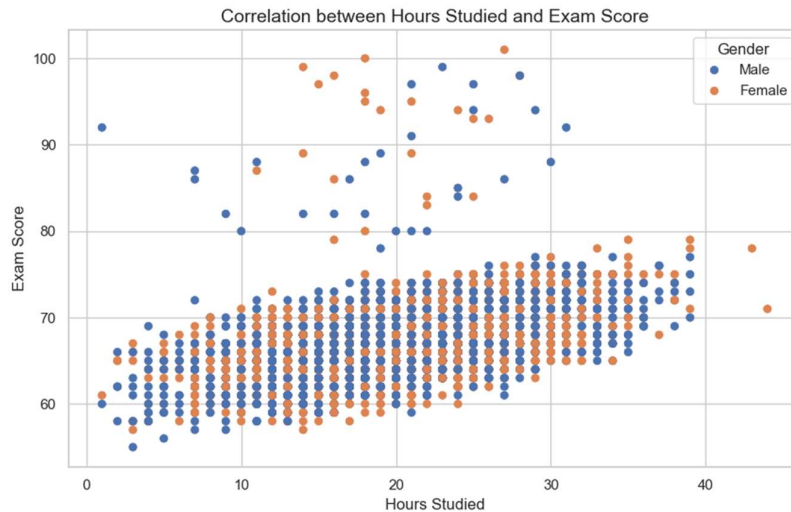
Python Code:

```
import matplotlib.pyplot as plt
import seaborn as sns
sns.set(style="whitegrid")
```

```

plt.figure(figsize=(10, 6))
sns.scatterplot(x='Hours_Studied', y='Exam_Score', data=student_data, hue='Gender', palette='deep',
marker='o', edgecolor=None)
plt.title('Correlation between Hours Studied and Exam Score', fontsize=14)
plt.xlabel('Hours Studied')
plt.ylabel('Exam Score')
plt.legend(title="Gender")
plt.show()

```



This scatter plot shows the relationship between the number of hours students spend studying and their exam scores, with the data also separated by gender. The trend reveals that more study hours generally lead to higher exam scores, though a few outliers show students who studied less but still performed well.

Encouraging students to maintain consistent study hours could significantly improve their exam performance. Schools should provide study skills workshops to help students organize their study time more effectively.

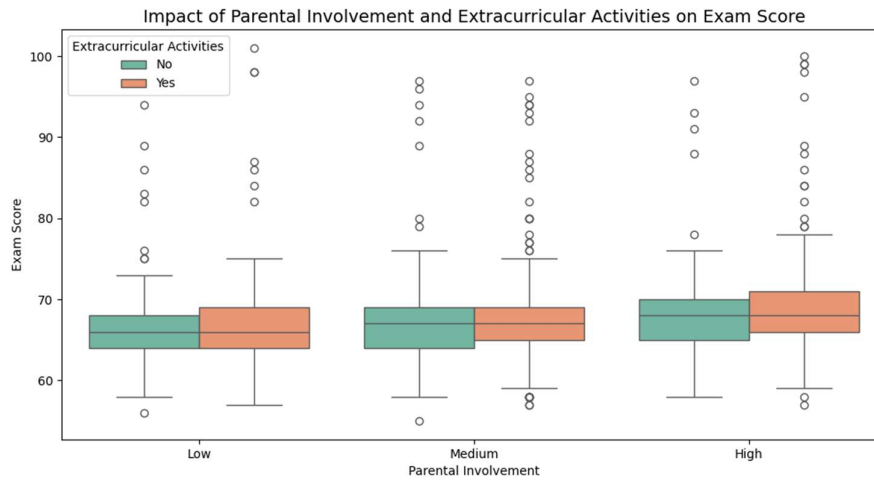
## 2. Impact of Parental Involvement and Extracurricular Activities on Exam Score

Python Code:

```

plt.figure(figsize=(12, 6))
sns.boxplot(x='Parental_Involvement', y='Exam_Score', hue='Extracurricular_Activities',
data=student_data, palette='Set2')
plt.title('Impact of Parental Involvement and Extracurricular Activities on Exam Score', fontsize=14)
plt.xlabel('Parental Involvement')
plt.ylabel('Exam Score')
plt.legend(title="Extracurricular Activities")
plt.show()

```



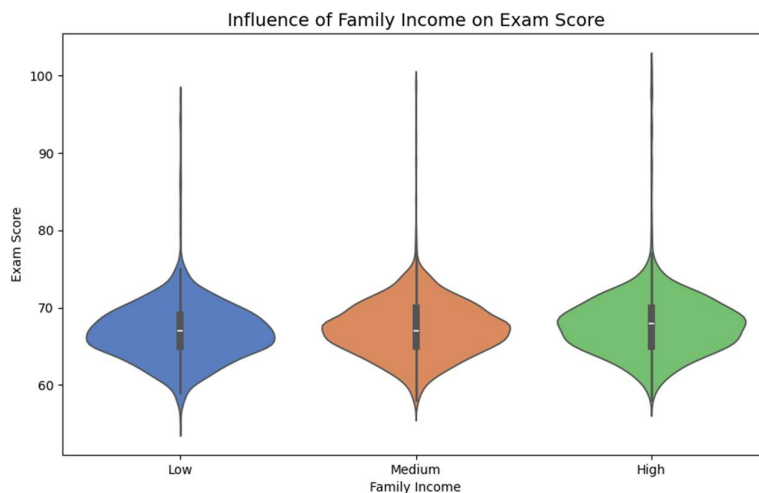
This box plot visualizes how parental involvement and participation in extracurricular activities influence student exam scores. Students with moderate to high levels of parental involvement who also participate in extracurricular activities tend to achieve better academic results.

Schools should encourage parents to take an active role in their children's academic journey. Additionally, promoting extracurricular activities can enhance a student's overall performance by improving time management and social skills.

### 3. Influence of Family Income on Exam Score

Python Code:

```
plt.figure(figsize=(10, 6))
sns.violinplot(x='Family_Income', y='Exam_Score', data=student_data, palette='muted')
plt.title('Influence of Family Income on Exam Score', fontsize=14)
plt.xlabel('Family Income')
plt.ylabel('Exam Score')
plt.show()
```



This violin plot displays how family income impacts exam scores. It shows that students from higher-income families generally achieve better exam scores, likely due to increased access to educational resources like tutoring, better school environments, and more parental support.

Policymakers should implement initiatives that provide additional support to students from lower-income backgrounds, such as scholarship programs, subsidized tutoring, and free access to learning resources.

## **Conclusion:**

The analysis of student performance factors reveals that several variables, such as study hours, parental involvement, extracurricular activities, and family income, play significant roles in determining academic success. Visualizing these relationships highlights the areas where interventions can be most effective. For instance, consistent study habits and higher parental involvement, coupled with engagement in extracurricular activities, correlate with improved exam scores. Moreover, socioeconomic factors like family income have a direct impact on academic outcomes, emphasizing the need for equitable access to resources.

These visualizations not only raise awareness but also offer actionable insights for educators, policymakers, and parents. By understanding these influences, stakeholders can create strategies to support students, especially those from disadvantaged backgrounds. Moving forward, continued research and investment in targeted programs will be essential in closing the performance gap and fostering a more inclusive learning environment. The findings underscore the importance of collaboration among families, schools, and policymakers to enhance the overall educational experience for all students.