Project Report

On

STUDENT SLEEP QUALITY PREDICYION

Submitted in partial fulfilment of the requirements for the award of

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE & ENGINEERING

(Artificial Intelligence & Machine Learning)

by

Ms. M PRASANNA (22WH1A6615)

Ms. S DEEPIKA PRAHARSHINI (22WH1A6623)

Ms. B HEMANYA SAI (22WH1A6636)

Ms. P JAHNAVI (22WH1A6639)

Under the esteemed guidance of

Ms. A Naga Kalyani

Assistant Professor, CSE(AI&ML)

Department of Computer Science & Engineering

(Artificial Intelligence & Machine Learning)

BVRIT HYDERABAD COLLEGE OF ENGINEERING FOR WOMEN

AUTONOMOUS)

(Approved by AICTE, New Delhi and Affiliated to JNTUH, Hyderabad)

Accredited by NBA and NAAC with A Grade

Bachupally, Hyderabad – 500090

2024-25

Department of Computer Science & Engineering

(Artificial Intelligence & Machine Learning)

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Bachupally, Hyderabad – 500090

2023-24

CERTIFICATE

This is to certify that the major project entitled **"Student Sleep Quality Prediction"** is a Bonafide work carried out by **Ms. M Prasanna (22WH1A6615), Ms. S Deepika Praharshini (22WH1A6623)**, **Ms. B Hemanya Sai (22WH1A6636), Ms. P Jahnavi (22WH1A6639**) in partial fulfilment for the award of B. Tech degree in **Computer Science & Engineering (AI&ML)**, **BVRIT HYDERABAD College of Engineering for Women, Bachupally, Hyderabad**, affiliated to Jawaharlal Nehru Technological University Hyderabad, Hyderabad under my guidance and supervision. The results embodied in the project work have not been submitted o any other University or Institute for the award of any degree or diploma.

Supervisor
Ms. A Naga Kalyani
Assistant Professor
Dept of CSE(AI&ML)

Head of the Department
Dr. B. Lakshmi Praveena
HOD & Professor

DECLARATION

We hereby declare that the work presented in this project entitled **"Student Sleep Quality Prediction"** submitted towards completion of Project work in III Year of B.Tech of CSE(AI&ML) at **BVRIT HYDERABAD College of Engineering for Women,** Hyderabad is an authentic record of our original work carried out under the guidance of **Ms. A Naga Kalyani, Assistant Professor, Department of CSE(AI&ML).**

Sign with Date:
M Prasanna
(22WH1A6615)

Sign with Date:
S Deepika Praharshini
(22WH1A6623)

Sign with Date:
B Hemanya Sai
(22WH1A6636)

Sign with Date:
P Jahnavi
(22WH1A6639)

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We are extremely thankful to our Internal Guide, **Ms. A Naga Kalyani, Assistant Professor, CSE(AI&ML), BVRIT HYDERABAD College of Engineering for Women,** for her constant guidance and encouragement throughout the project.

Finally, we would like to thank our Major Project Coordinator, all Faculty and Staff of CSE(AI&ML) department who helped us directly or indirectly. Last but not least, we wish to acknowledge our **Parents** and **Friends** for giving moral strength and constant encouragement.

M Prasanna
(22WH1A6615)

S Deepika Praharshini
(22WH1A6623)

B Hemanya Sai
(22WH1A6636)

P Jahnavi
(22WH1A6639)

PROBLEM STATEMENT

The goal is to develop a Project Management Dashboard mobile application that allows users to manage and track their projects effectively. The app should enable users to:

- Create, view, edit, and delete projects easily, allowing for dynamic project management at every stage.
- Add and manage tasks, team members, and expenses related to each project, ensuring efficient team collaboration and task tracking.
- Track the project's budget and expenses, allowing users to keep a real-time check on spending and ensure it stays within allocated limits.
- Implement password protection for secure access to sensitive project details, ensuring that only authorized users can view or edit project information.
- Provide an intuitive, responsive UI that adapts to different screen sizes and ensures a seamless, user-friendly experience.

The app will offer a comprehensive yet easy-to-use platform for project managers and teams to manage the various facets of their projects, ensuring streamlined operations and control over project-related data.

ABSTRACT

The **Project Management Dashboard** is a Flutter-based app designed to simplify project management by providing a centralized platform to manage project details, tasks, team members, and budgets. The app features a **Project List Screen** that displays active projects, enabling users to add, edit, view, or delete projects securely with password protection. A detailed **Project Details Screen** offers functionality to assign tasks, track expenses, and monitor project progress. The app ensures smooth user experience with responsive layouts, gradient backgrounds, and transparent app bars, complemented by Flutter's setState () for real-time UI updates. Dialogs handle adding or editing tasks, team members, and expenses, while snackbars provide feedback for errors like incorrect passwords. Designed for security and functionality, the app is ideal for individuals or teams seeking an efficient way to organize and track projects from initiation to completion.

DATASET

Students Sleep Pattern– Kaggle

https://www.kaggle.com/datasets/arsalanjamal002/student-sleep patterns?resource=download

SOURCE CODE

```
import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

import seaborn as sns

from sklearn.model_selection import train_test_split

from sklearn.linear_model import LinearRegression

from sklearn.metrics import mean_absolute_error, mean_squared_error, r2_score


# Load the dataset

data = pd.read_csv('/content/drive/MyDrive/student_sleep_patterns.csv')


# Display the first few rows

print(data.head())


# Check for missing values and handle them

data = data.dropna()


# Generate a correlation heatmap for numerical columns

numerical_data = data.select_dtypes(include=[np.number])

plt.figure(figsize=(10, 8))
```

```
sns.heatmap(numerical_data.corr(), annot=True, cmap='coolwarm', fmt='.2f')
plt.title('Correlation Heatmap')
plt.show()

# For Simple Linear Regression, let's say we use 'Study_Hours' as the independent variable
# and 'Sleep_Quality' as the dependent variable
X = data[['Study_Hours']]  # Independent variable
y = data['Sleep_Quality']  # Dependent variable

# Split the data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

# Initialize and train the Linear Regression model
linear_model = LinearRegression()
linear_model.fit(X_train, y_train)

# Predict on the test data
y_pred = linear_model.predict(X_test)

# Calculate errors
mae = mean_absolute_error(y_test, y_pred)
mse = mean_squared_error(y_test, y_pred)
rmse = np.sqrt(mse)

# Define a threshold for acceptable error (e.g., within 10% of actual values)
threshold = 0.1
```

```
# Calculate the percentage of predictions within the threshold
accurate_predictions = np.abs(y_pred - y_test) <= (threshold * y_test)
accuracy = np.mean(accurate_predictions) * 100

print(f"Accuracy of the model: {accuracy:.2f}%")

# Plot the distribution of the target variable
plt.figure(figsize=(8, 6))
sns.histplot(data['Sleep_Quality'], kde=True, bins=10, color='blue')
plt.title('Distribution of Sleep Quality')
plt.xlabel('Sleep Quality')

plt.ylabel('Frequency')
plt.show()

# Normalize MAE and MSE to ensure errors between 0 and 1
mae_normalized = mae / (y_test.max() - y_test.min())
mse_normalized = mse / (y_test.max() - y_test.min())**2

# Calculate R² score and ensure it's non-negative
r2 = max(0, r2_score(y_test, y_pred))

# Print the results
print("Normalized Mean Absolute Error (NMAE):", mae_normalized)
print("Normalized Mean Squared Error (NMSE):", mse_normalized)
```

```
print("Root Mean Squared Error (RMSE):", rmse)

print("R2 Score:", r2)


# Plot the regression line

plt.scatter(X_test, y_test, color='blue', label='Actual data')

plt.plot(X_test, y_pred, color='red', label='Regression line')

plt.title('Simple Linear Regression')

plt.xlabel('Study Hours')

plt.ylabel('Sleep Quality')

plt.legend()

plt.show()
```

OUTPUT

Displaying the Dataset

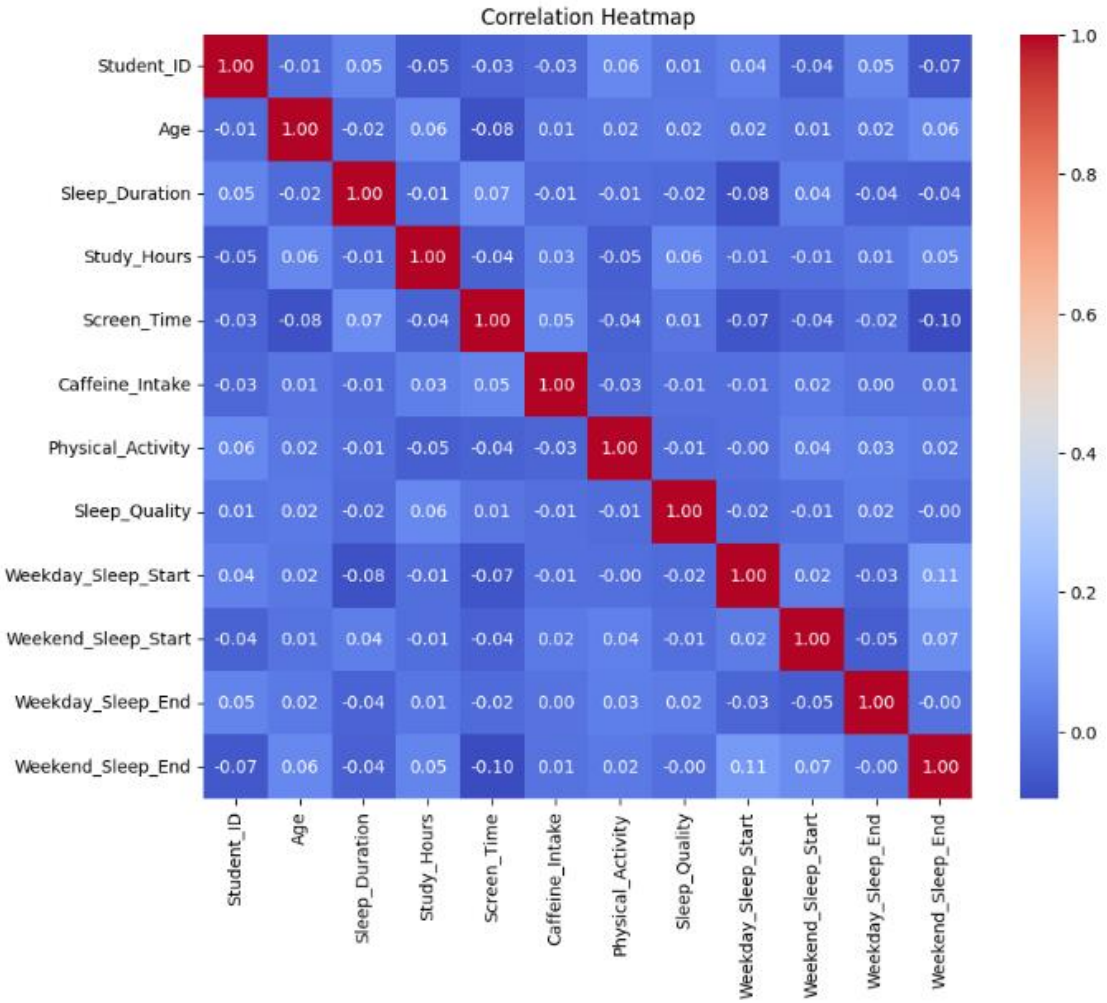
	Student_ID	Age	Gender	University_Year	Sleep_Duration	Study_Hours	\
0	1	24	Other	2nd Year	7.7	7.9	
1	2	21	Male	1st Year	6.3	6.0	
2	3	22	Male	4th Year	5.1	6.7	
3	4	24	Other	4th Year	6.3	8.6	
4	5	20	Male	4th Year	4.7	2.7	

	Screen_Time	Caffeine_Intake	Physical_Activity	Sleep_Quality	\
0	3.4	2	37	10	
1	1.9	5	74	2	
2	3.9	5	53	5	
3	2.8	4	55	9	
4	2.7	0	85	3	

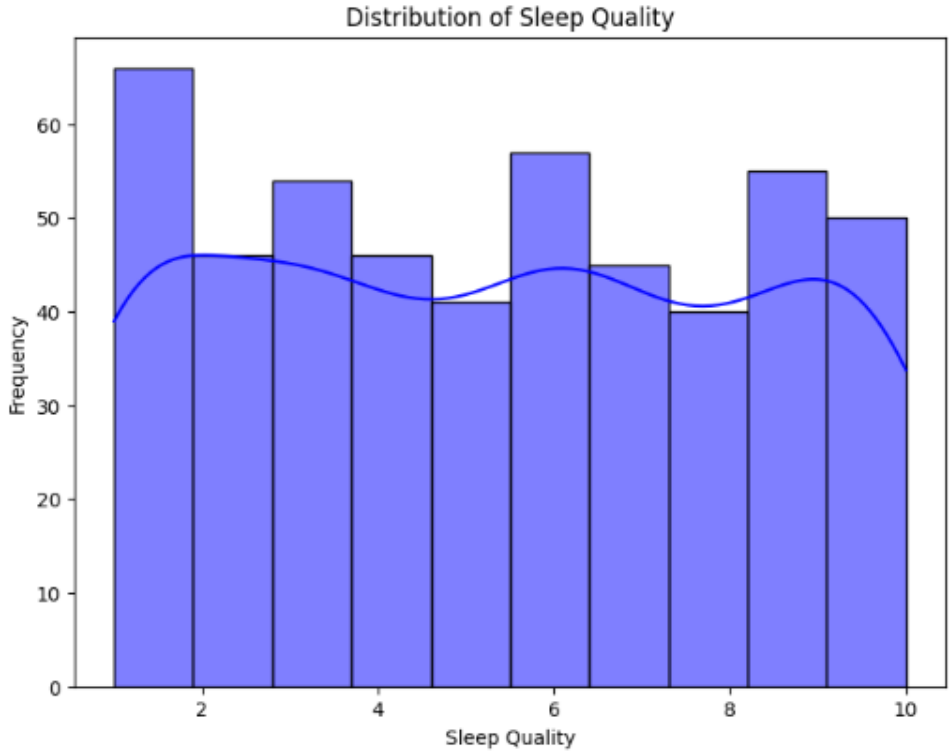
	Weekday_Sleep_Start	Weekend_Sleep_Start	Weekday_Sleep_End	\
0	14.16	4.05	7.41	
1	8.73	7.10	8.21	
2	20.00	20.47	6.88	
3	19.82	4.08	6.69	
4	20.98	6.12	8.98	

	Weekend_Sleep_End
0	7.06
1	10.21
2	10.92
3	9.42
4	9.0

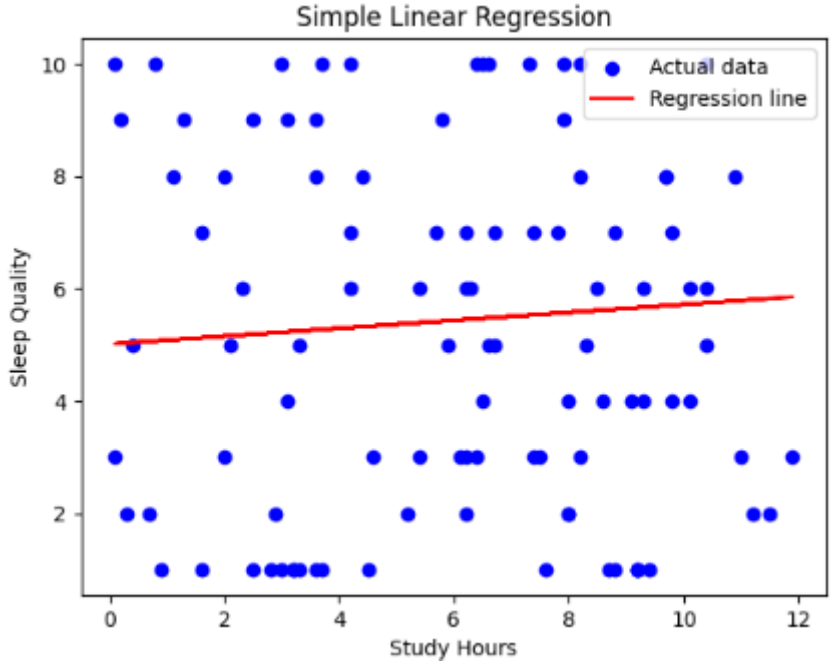
CO-RELATION HEAT MAP



DISTRIBUTION OF TARGET VARIABLE



SCATTER PLOT OF TWO FEATURES



THRESHOLD USING MEAN

Normalized Mean Absolute Error (NMAE): 0.30586139943771706

Normalized Mean Squared Error (NMSE): 0.12075715018841025

Root Mean Squared Error (RMSE): 3.127511657094379

R2 Score