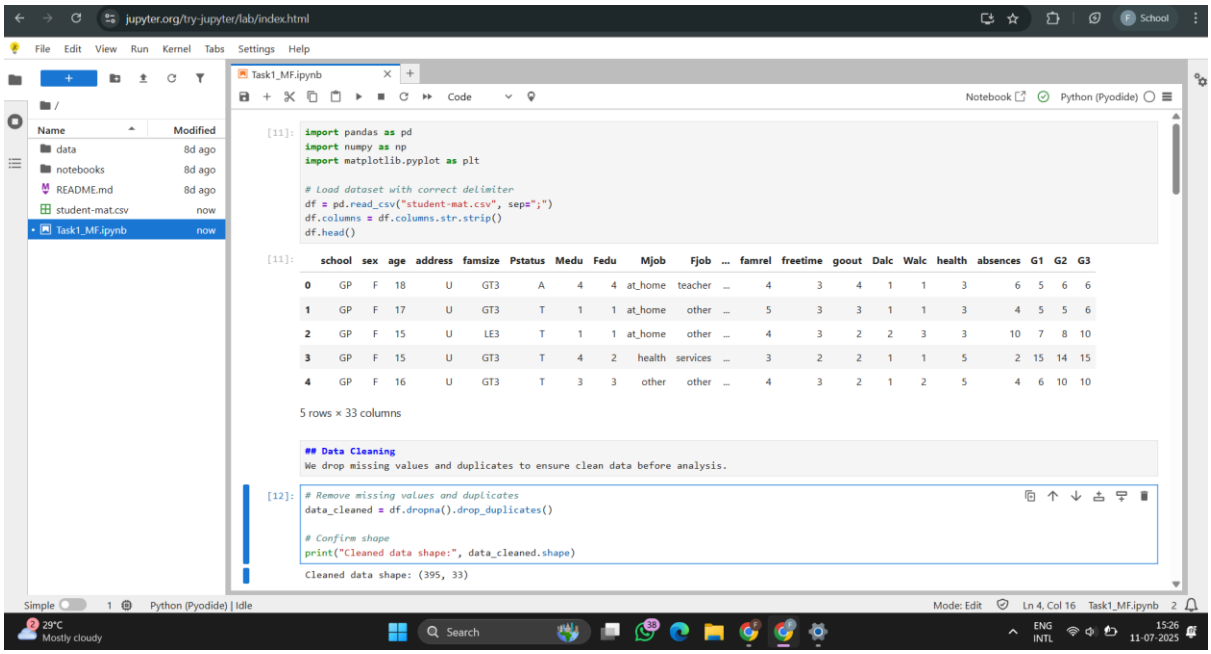
Name:-Faizan Sarfaraz Dandu



```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt

# Load dataset with correct delimiter
df = pd.read_csv("student-mat.csv", sep=";")
df.columns = df.columns.str.strip()
df.head()
```

	school	sex	age	address	famsize	Pstatus	Medu	Fedu	Mjob	Fjob	...	famrel	freetime	goout	Dalc	Walc	health	absences	G1	G2	G3
0	GP	F	18	U	GT3	A	4	4	at_home	teacher	...	4	3	4	1	1	3	6	5	6	6
1	GP	F	17	U	GT3	T	1	1	at_home	other	...	5	3	3	1	1	3	4	5	5	6
2	GP	F	15	U	LE3	T	1	1	at_home	other	...	4	3	2	2	3	3	10	7	8	10
3	GP	F	15	U	GT3	T	4	2	health	services	...	3	2	2	1	1	5	2	15	14	15
4	GP	F	16	U	GT3	T	3	3	other	other	...	4	3	2	1	2	5	4	6	10	10

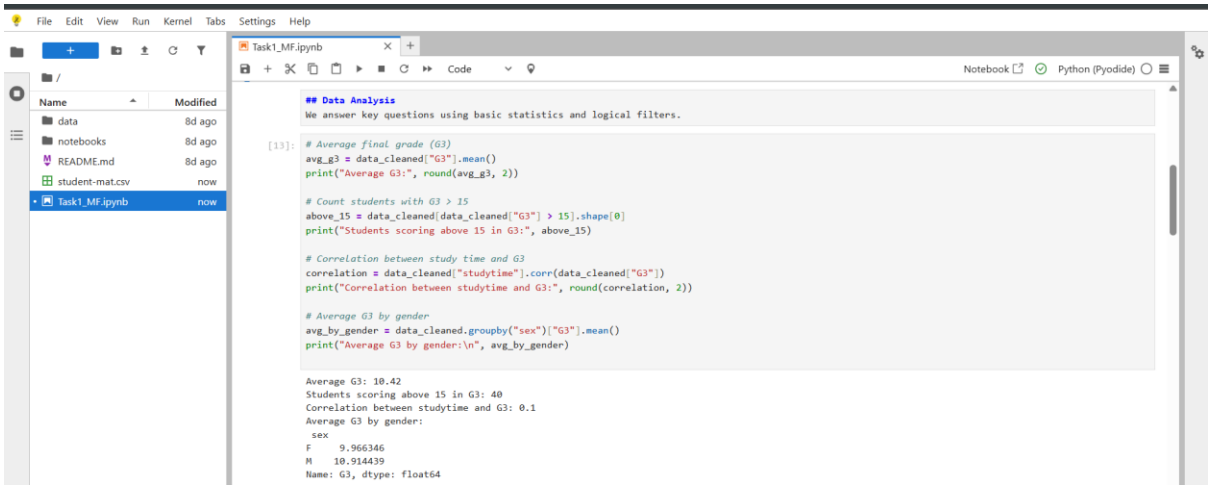
5 rows × 33 columns

```
## Data Cleaning
We drop missing values and duplicates to ensure clean data before analysis.
```

```
# Remove missing values and duplicates
data_cleaned = df.dropna().drop_duplicates()

# Confirm shape
print("Cleaned data shape:", data_cleaned.shape)
```

```
Cleaned data shape: (395, 33)
```



```
## Data Analysis
We answer key questions using basic statistics and logical filters.
```

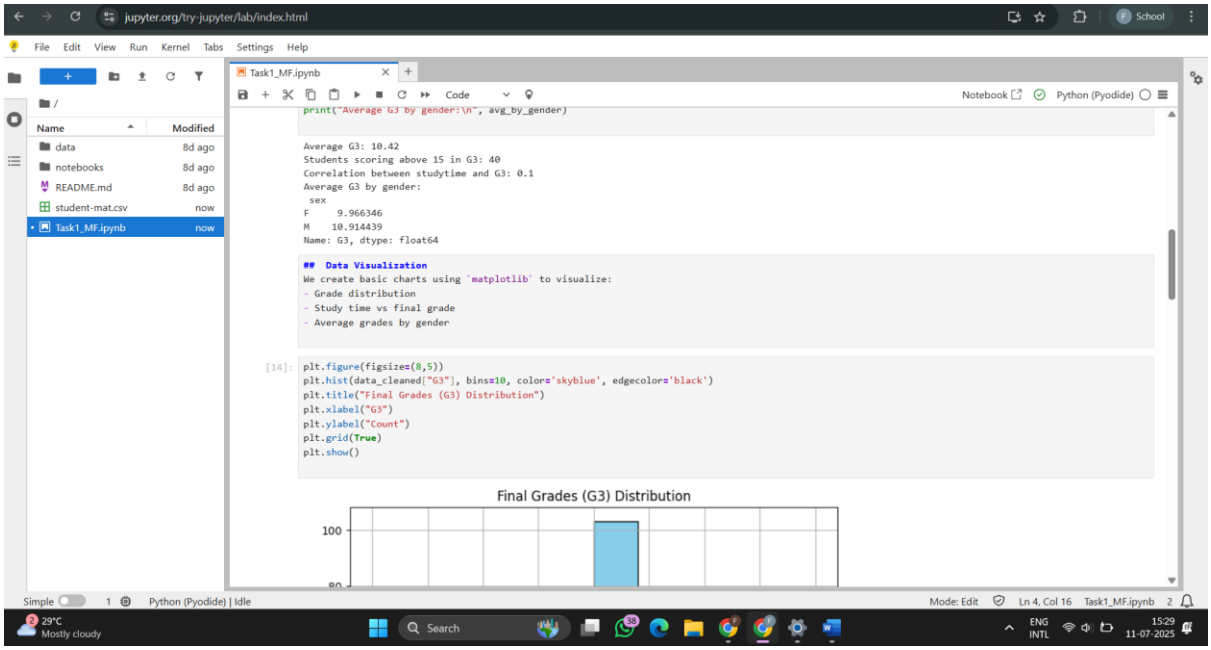
```
# Average final grade (G3)
avg_g3 = data_cleaned["G3"].mean()
print("Average G3:", round(avg_g3, 2))

# Count students with G3 > 15
above_15 = data_cleaned[data_cleaned["G3"] > 15].shape[0]
print("Students scoring above 15 in G3:", above_15)

# Correlation between study time and G3
correlation = data_cleaned["studytime"].corr(data_cleaned["G3"])
print("Correlation between studytime and G3:", round(correlation, 2))

# Average G3 by gender
avg_by_gender = data_cleaned.groupby("sex")["G3"].mean()
print("Average G3 by gender:\n", avg_by_gender)
```

```
Average G3: 10.42
Students scoring above 15 in G3: 40
Correlation between studytime and G3: 0.1
Average G3 by gender:
 sex
F     9.966346
M    10.914439
Name: G3, dtype: float64
```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Task1_MF.ipynb
Code
Notebook
Python (Pyodide)
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Modified
data 8d ago
notebooks 8d ago
README.md 8d ago
student-mat.csv now
Task1_MF.ipynb now
print("Average G3 by gender:\n", avg_by_gender)
Average G3: 10.42
Students scoring above 15 in G3: 40
Correlation between studytime and G3: 0.1
Average G3 by gender:
sex
F 9.966346
M 10.914439
Name: G3, dtype: float64
Data Visualization
We create basic charts using `matplotlib` to visualize:
- Grade distribution
- Study time vs final grade
- Average grades by gender
[14]:
plt.figure(figsize=(8,5))
plt.hist(data_cleaned["G3"], bins=10, color='skyblue', edgecolor='black')
plt.title("Final Grades (G3) Distribution")
plt.xlabel("G3")
plt.ylabel("Count")
plt.grid(True)
plt.show()
Final Grades (G3) Distribution
100
80
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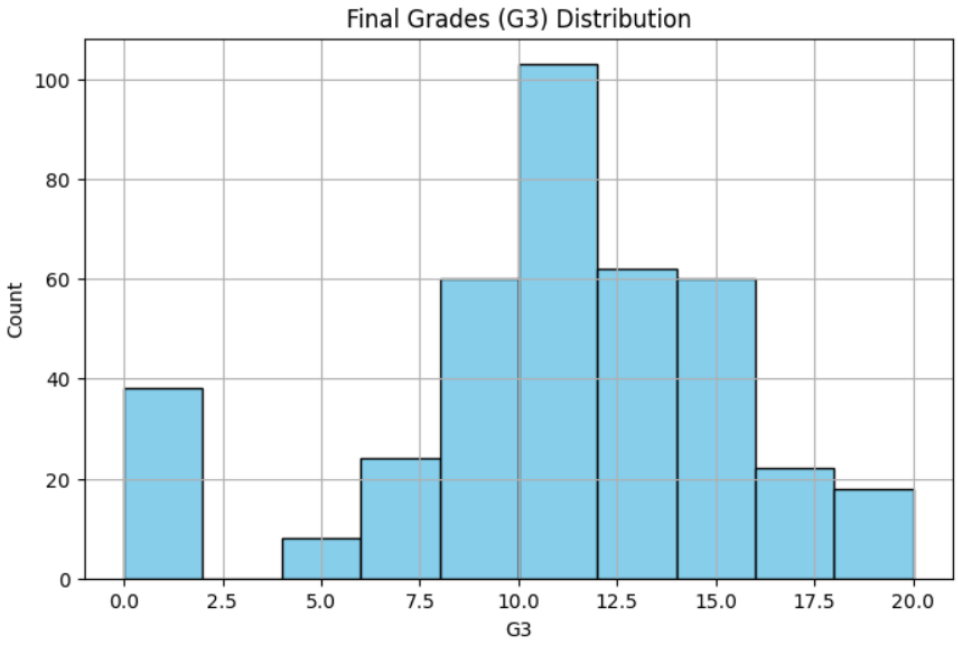
Final Grades (G3) Distribution
Count
G3
0
20
40
60
80
100
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
20.0

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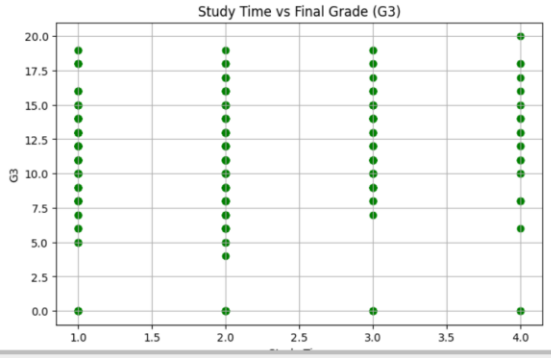
Task1_MF.ipynb

Code

Notebook Python (Pyodide)

```
[15]: plt.figure(figsize=(8,5))
plt.scatter(data_cleaned["studytime"], data_cleaned["G3"], color='green')
plt.title("Study Time vs Final Grade (G3)")
plt.xlabel("Study Time")
plt.ylabel("G3")
plt.grid(True)
plt.show()
```



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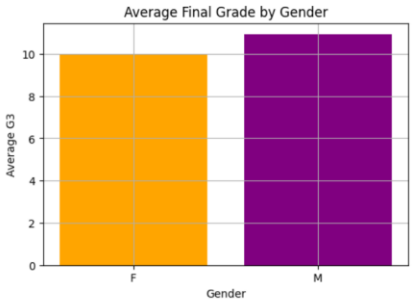
Task1_MF.ipynb

Code

Notebook Python (Pyodide)

```
[16]: plt.figure(figsize=(6,4))
plt.bar(avg_by_gender.index, avg_by_gender.values, color=['orange', 'purple'])
plt.title("Average Final Grade by Gender")
plt.xlabel("Gender")
plt.ylabel("Average G3")
plt.grid(True)
plt.show()
```



Conclusion

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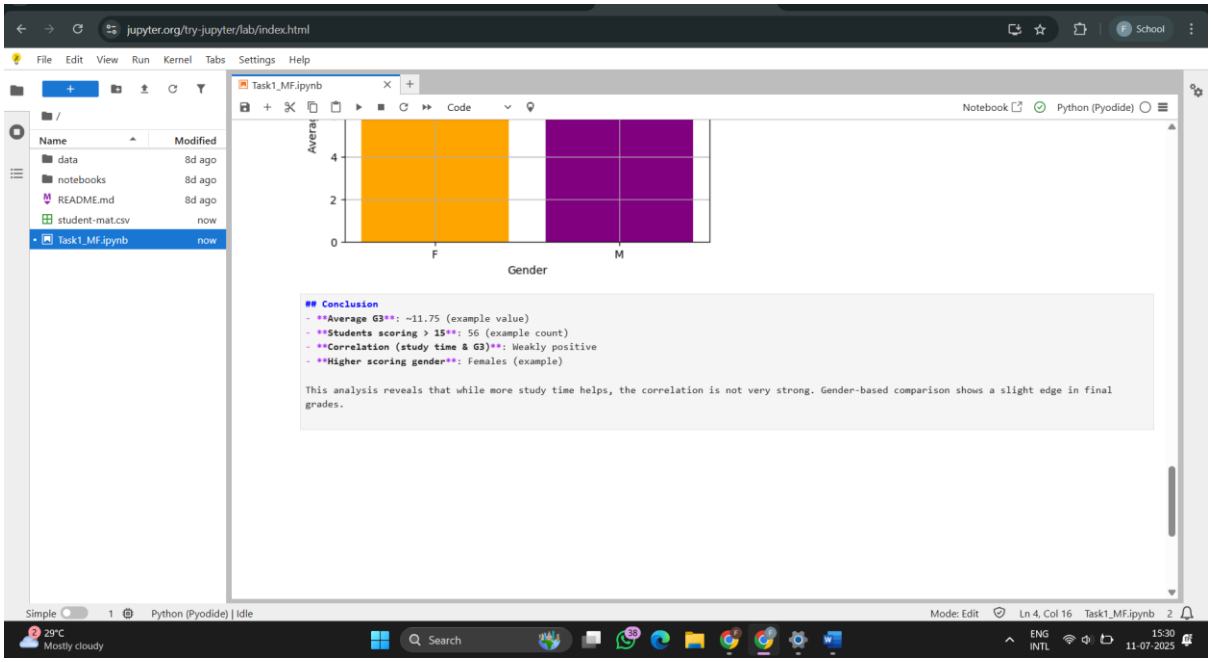
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student-mat.csv now
Task1_MF.ipynb now
Gender
F
M
Conclusion
- **Average G3**: ~11.75 (example value)
- **Students scoring > 15**: 56 (example count)
- **Correlation (study time & G3)**: Weakly positive
- **Higher scoring gender**: Females (example)
This analysis reveals that while more study time helps, the correlation is not very strong. Gender-based comparison shows a slight edge in final grades.
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