```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
# Exam scores of 20 students
scores = {"Alice":78,
          "Bob":85,
          "Virat":99,
          "Charlie": 48,
          "Smith":65,
          "William": 30,
          "George": 88,
          "Jones":95,
          "David": 70,
          "Frank":75,
          "Grace":80,
          "Henry" :82,
          "Isaac":49,
          "Jack":90,
          "Karen":68,
          "Moore": 73,
          "Taylor":69,
          "Noah":93,
          "Thomas": 71,
          "Tara": 76,
          "Sam": 83}
df=pd.DataFrame(list(scores.items()),columns=['Name','Score'])
excel_file_name="student_scores.xlsx"
df.to_excel(excel_file_name,index=False)
print(f"DataFrame saved to {excel_file_name}")
```

```
DataFrame saved to student_scores.xlsx
```

```
df_read = pd.read_excel(excel_file_name)
print("Data read from Excel file:")
print(df_read)
average_score=df['Score'].mean()
print("Average Score:",average_score)
```

```
Data read from Excel file:
       Name  Score
0     Alice     78
1       Bob     85
2     Virat     99
3   Charlie     48
4     Smith     65
5   William     30
6    George     88
7     Jones     95
8     David     70
9     Frank     75
10    Grace     80
11    Henry     82
12    Isaac     49
```

```
13     Jack     90
14    Karen     68
15    Moore     73
16   Taylor     69
17     Noah     93
18   Thomas     71
19     Tara     76
20      Sam     83
Average Score: 74.61904761904762
```

```
passing_score = 50
passed_students = df[df['Score'] >= passing_score]
print("Number of students Passed:",len(passed_students))
print("Scores of students who passed:")
print(passed_students)
```

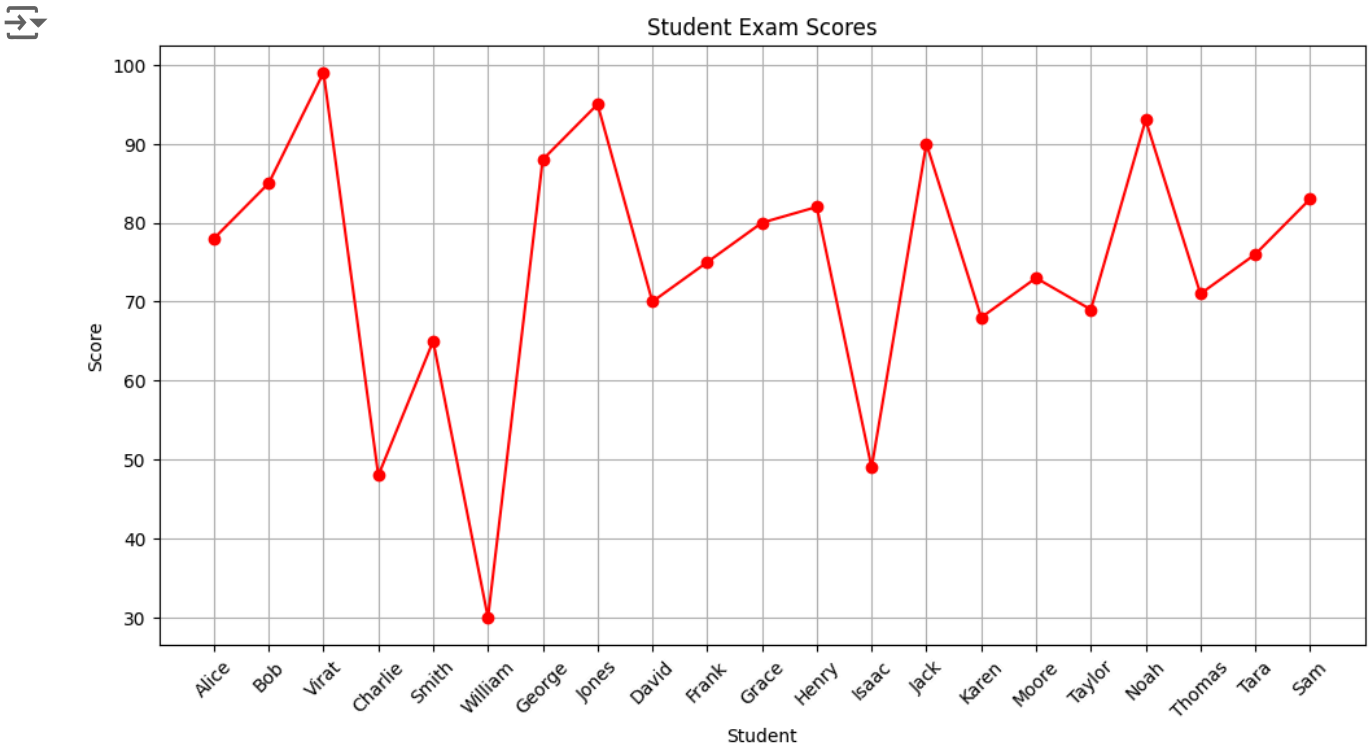
```
Number of students Passed: 18
Scores of students who passed:
      Name  Score
0    Alice     78
1      Bob     85
2    Virat     99
4    Smith     65
6   George     88
7    Jones     95
8    David     70
9    Frank     75
10   Grace     80
11   Henry     82
13    Jack     90
14   Karen     68
15   Moore     73
16  Taylor     69
17    Noah     93
18  Thomas     71
19    Tara     76
20     Sam     83
```

```
def determine_grade(score):
    if score >= 90:
        return '0'
    elif score >= 80:
        return 'A'
    elif score >= 70:
        return 'B'
    elif score >= 60:
        return 'C'
    else:
        return 'F'
df_read['Grade'] = df_read['Score'].apply(determine_grade)
print("Grades:")
print(df_read)
```

```
Grades:
      Name  Score Grade
0    Alice     78     B
```

```
1       Bob     85     A
2     Virat     99     0
3   Charlie     48     F
4     Smith     65     C
5   William     30     F
6    George     88     A
7     Jones     95     0
8     David     70     B
9     Frank     75     B
10    Grace     80     A
11    Henry     82     A
12    Isaac     49     F
13     Jack     90     0
14    Karen     68     C
15    Moore     73     B
16   Taylor     69     C
17     Noah     93     0
18   Thomas     71     B
19     Tara     76     B
20      Sam     83     A
```

```
plt.figure(figsize=(12,6))
plt.plot(df_read['Name'],df_read['Score'],marker='o',color='red')
plt.title('Student Exam Scores')
plt.xlabel('Student')
plt.ylabel('Score')
plt.xticks(rotation=45)
plt.grid(True)
plt.show()
```




```
max_score=df['Score'].max()
curve_amount = 100 - max_score
df['Curved Score'] = df['Score'] + curve_amount
average_curved_score=df['Curved Score'].mean()
```

```
print("Average Curved Score:",average_curved_score)
df['Grade']=df['Curved Score'].apply(determine_grade)
print(df)
```

```
Average Curved Score: 75.61904761904762
       Name  Score  Curved Score Grade
0     Alice     78            79     B
1       Bob     85            86     A
2     Virat     99           100     0
3   Charlie     48            49     F
4     Smith     65            66     C
5   William     30            31     F
6    George     88            89     A
7     Jones     95            96     0
8     David     70            71     B
9     Frank     75            76     B
10    Grace     80            81     A
11    Henry     82            83     A
12    Isaac     49            50     F
13     Jack     90            91     0
14    Karen     68            69     C
15    Moore     73            74     B
16   Taylor     69            70     B
17     Noah     93            94     0
18   Thomas     71            72     B
19     Tara     76            77     B
20      Sam     83            84     A
```