STUDENTS ADDICTION ON SOCIAL MEDIA

Importing Libraries

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

Importing Data

```
df = pd.read_csv("C:/Banu for fun/Data 
Analytics/Python/Project/Students addiction on social media.csv")
```

Initial Data Exploration and Structure Overview

```
df.sample(10)

     Student_ID  Age  Gender Academic_Level       Country  \
449         450   21    Male       Graduate        Canada
535         536   22    Male       Graduate      Malaysia
40           41   24    Male       Graduate  South Africa
91           92   19  Female  Undergraduate       Albania
174         175   20  Female  Undergraduate         Nepal
445         446   21    Male       Graduate        Turkey
585         586   23    Male       Graduate        Poland
301         302   21    Male       Graduate            UK
51           52   20  Female  Undergraduate      Paraguay
270         271   20  Female  Undergraduate     Australia

     Avg_Daily_Usage_Hours Most_Used_Platform 
Affects_Academic_Performance  \
449                    4.1          Instagram 
Yes
535                    5.8           WhatsApp 
Yes
40                     2.3           LinkedIn 
No
91                     4.7             TikTok 
Yes
174                    5.7             TikTok 
Yes
445                    4.3          Instagram 
Yes
585                    6.4           Facebook 
Yes
301                    4.8           Facebook 
Yes
51                     4.7             TikTok 
Yes
```

```
270                    4.5          Instagram
No

     Sleep_Hours_Per_Night  Mental_Health_Score Relationship_Status  \
449                    8.1                    6              Single
535                    6.5                    6              Single
40                     7.3                    8     In Relationship
91                     5.8                    6         Complicated
174                    5.6                    6              Single
445                    7.9                    6              Single
585                    6.3                    5              Single
301                    6.8                    6     In Relationship
51                     5.8                    6     In Relationship
270                    7.3                    7              Single

     Conflicts_Over_Social_Media  Addicted_Score
449                            3               7
535                            3               7
40                             1               4
91                             3               7
174                            4               8
445                            3               7
585                            4               8
301                            3               7
51                             3               7
270                            2               5
```

```python
print("No of Rows & Columns :", df.shape)
```

```
No of Rows & Columns : (705, 13)
```

```python
df.dtypes
```

```
Student_ID                        int64
Age                               int64
Gender                           object
Academic_Level                   object
Country                          object
Avg_Daily_Usage_Hours           float64
Most_Used_Platform               object
Affects_Academic_Performance     object
Sleep_Hours_Per_Night           float64
Mental_Health_Score               int64
Relationship_Status              object
Conflicts_Over_Social_Media       int64
Addicted_Score                    int64
dtype: object
```

```python
df.isnull().sum()
```

```
Student_ID                      0
Age                             0
Gender                          0
Academic_Level                  0
Country                         0
Avg_Daily_Usage_Hours           0
Most_Used_Platform              0
Affects_Academic_Performance    0
Sleep_Hours_Per_Night           0
Mental_Health_Score             0
Relationship_Status             0
Conflicts_Over_Social_Media     0
Addicted_Score                  0
dtype: int64
```

```
df.describe()
```

```
       Student_ID         Age  Avg_Daily_Usage_Hours
Sleep_Hours_Per_Night  \
count  705.000000  705.000000             705.000000
705.000000
mean   353.000000   20.659574               4.918723
6.868936
std    203.660256    1.399217               1.257395
1.126848
min      1.000000   18.000000               1.500000
3.800000
25%    177.000000   19.000000               4.100000
6.000000
50%    353.000000   21.000000               4.800000
6.900000
75%    529.000000   22.000000               5.800000
7.700000
max    705.000000   24.000000               8.500000
9.600000

       Mental_Health_Score  Conflicts_Over_Social_Media
Addicted_Score
count           705.000000                   705.000000
705.000000
mean              6.226950                     2.849645
6.436879
std               1.105055                     0.957968
1.587165
min               4.000000                     0.000000
2.000000
25%               5.000000                     2.000000
5.000000
50%               6.000000                     3.000000
7.000000
```

```
75%                  7.000000                     4.000000
8.000000
max                  9.000000                     5.000000
9.000000
```

This section offers a comprehensive initial exploration of the dataset, highlighting its structure, data types, and a sample of entries. It also checks for missing values and provides basic statistical insights to understand the data distribution.

Data Cleaning

```
df.nunique()
```

```
Student_ID                      705
Age                               7
Gender                            2
Academic_Level                    3
Country                         110
Avg_Daily_Usage_Hours            67
Most_Used_Platform               12
Affects_Academic_Performance      2
Sleep_Hours_Per_Night            59
Mental_Health_Score               6
Relationship_Status               3
Conflicts_Over_Social_Media       6
Addicted_Score                    8
dtype: int64
```

```
df.duplicated().any()
```

```
False
```

```
columns = [
    "Academic_Level",
    "Country",
    "Most_Used_Platform",
    "Affects_Academic_Performance",
    "Relationship_Status"
]

for col in columns:
    print(f"\nUnique values in '{col}':")
    print(df[col].unique())
```

```

Unique values in 'Academic_Level':
['Undergraduate' 'Graduate' 'High School']

Unique values in 'Country':
['Bangladesh' 'India' 'USA' 'UK' 'Canada' 'Australia' 'Germany'
'Brazil'
```

```
 'Japan' 'South Korea' 'France' 'Spain' 'Italy' 'Mexico' 'Russia'
'China'
 'Sweden' 'Norway' 'Denmark' 'Netherlands' 'Belgium' 'Switzerland'
 'Austria' 'Portugal' 'Greece' 'Ireland' 'New Zealand' 'Singapore'
 'Malaysia' 'Thailand' 'Vietnam' 'Philippines' 'Indonesia' 'Taiwan'
 'Hong Kong' 'Turkey' 'Israel' 'UAE' 'Egypt' 'Morocco' 'South Africa'
 'Nigeria' 'Kenya' 'Ghana' 'Argentina' 'Chile' 'Colombia' 'Peru'
 'Venezuela' 'Ecuador' 'Uruguay' 'Paraguay' 'Bolivia' 'Costa Rica'
 'Panama' 'Jamaica' 'Trinidad' 'Bahamas' 'Iceland' 'Finland' 'Poland'
 'Romania' 'Hungary' 'Czech Republic' 'Slovakia' 'Croatia' 'Serbia'
 'Slovenia' 'Bulgaria' 'Estonia' 'Latvia' 'Lithuania' 'Ukraine'
'Moldova'
 'Belarus' 'Kazakhstan' 'Uzbekistan' 'Kyrgyzstan' 'Tajikistan'
'Armenia'
 'Georgia' 'Azerbaijan' 'Cyprus' 'Malta' 'Luxembourg' 'Monaco'
'Andorra'
 'San Marino' 'Vatican City' 'Liechtenstein' 'Montenegro' 'Albania'
 'North Macedonia' 'Kosovo' 'Bosnia' 'Qatar' 'Kuwait' 'Bahrain' 'Oman'
 'Jordan' 'Lebanon' 'Iraq' 'Yemen' 'Syria' 'Afghanistan' 'Pakistan'
 'Nepal' 'Bhutan' 'Sri Lanka' 'Maldives']

Unique values in 'Most_Used_Platform':
['Instagram' 'Twitter' 'TikTok' 'YouTube' 'Facebook' 'LinkedIn'
'Snapchat'
 'LINE' 'KakaoTalk' 'VKontakte' 'WhatsApp' 'WeChat']

Unique values in 'Affects_Academic_Performance':
['Yes' 'No']

Unique values in 'Relationship_Status':
['In Relationship' 'Single' 'Complicated']
```

```python
df['Country'] = df['Country'].replace({'USA':'United States of
America','UK' :'United Kingdom', 'UAE' : 'United Arab Emirates'})

columns = [
    "Academic_Level",
    "Country",
    "Most_Used_Platform",
    "Affects_Academic_Performance",
    "Relationship_Status"
]

for col in columns:
    print(f"\nUnique values in '{col}':")
    print(df[col].unique())
```

```
Unique values in 'Academic_Level':
['Undergraduate' 'Graduate' 'High School']
```

```
Unique values in 'Country':
['Bangladesh' 'India' 'United States of America' 'United Kingdom'
'Canada'
 'Australia' 'Germany' 'Brazil' 'Japan' 'South Korea' 'France' 'Spain'
 'Italy' 'Mexico' 'Russia' 'China' 'Sweden' 'Norway' 'Denmark'
 'Netherlands' 'Belgium' 'Switzerland' 'Austria' 'Portugal' 'Greece'
 'Ireland' 'New Zealand' 'Singapore' 'Malaysia' 'Thailand' 'Vietnam'
 'Philippines' 'Indonesia' 'Taiwan' 'Hong Kong' 'Turkey' 'Israel'
 'United Arab Emirates' 'Egypt' 'Morocco' 'South Africa' 'Nigeria'
'Kenya'
 'Ghana' 'Argentina' 'Chile' 'Colombia' 'Peru' 'Venezuela' 'Ecuador'
 'Uruguay' 'Paraguay' 'Bolivia' 'Costa Rica' 'Panama' 'Jamaica'
'Trinidad'
 'Bahamas' 'Iceland' 'Finland' 'Poland' 'Romania' 'Hungary'
 'Czech Republic' 'Slovakia' 'Croatia' 'Serbia' 'Slovenia' 'Bulgaria'
 'Estonia' 'Latvia' 'Lithuania' 'Ukraine' 'Moldova' 'Belarus'
'Kazakhstan'
 'Uzbekistan' 'Kyrgyzstan' 'Tajikistan' 'Armenia' 'Georgia'
'Azerbaijan'
 'Cyprus' 'Malta' 'Luxembourg' 'Monaco' 'Andorra' 'San Marino'
 'Vatican City' 'Liechtenstein' 'Montenegro' 'Albania' 'North
Macedonia'
 'Kosovo' 'Bosnia' 'Qatar' 'Kuwait' 'Bahrain' 'Oman' 'Jordan'
'Lebanon'
 'Iraq' 'Yemen' 'Syria' 'Afghanistan' 'Pakistan' 'Nepal' 'Bhutan'
 'Sri Lanka' 'Maldives']

Unique values in 'Most_Used_Platform':
['Instagram' 'Twitter' 'TikTok' 'YouTube' 'Facebook' 'LinkedIn'
'Snapchat'
 'LINE' 'KakaoTalk' 'VKontakte' 'WhatsApp' 'WeChat']

Unique values in 'Affects_Academic_Performance':
['Yes' 'No']

Unique values in 'Relationship_Status':
['In Relationship' 'Single' 'Complicated']

CountryCode = {
    'Bangladesh': 'BD',
    'India': 'IN',
    'United States of America': 'US',
    'United Kingdom': 'GB',
    'Canada': 'CA',
    'Australia': 'AU',
    'Germany': 'DE',
    'Brazil': 'BR',
    'Japan': 'JP',
    'South Korea': 'KR',
    'France': 'FR',
    'Spain': 'ES',
    'Italy': 'IT',
    'Mexico': 'MX',
    'Russia': 'RU',
    'China': 'CN',
    'Sweden': 'SE',
    'Norway': 'NO',
    'Denmark': 'DK',
    'Netherlands': 'NL',
    'Belgium': 'BE',
    'Switzerland': 'CH',
    'Austria': 'AT',
    'Portugal': 'PT',
    'Greece': 'GR',
    'Ireland': 'IE',
    'New Zealand': 'NZ',
    'Singapore': 'SG',
    'Malaysia': 'MY',
    'Thailand': 'TH',
    'Vietnam': 'VN',
    'Philippines': 'PH',
    'Indonesia': 'ID',
    'Taiwan': 'TW',
    'Hong Kong': 'HK',
    'Turkey': 'TR',
    'Israel': 'IL',
    'United Arab Emirates': 'AE',
    'Egypt': 'EG',
    'Morocco': 'MA',
    'South Africa': 'ZA',
    'Nigeria': 'NG',
    'Kenya': 'KE',
    'Ghana': 'GH',
    'Argentina': 'AR',
    'Chile': 'CL',
    'Colombia': 'CO',
    'Peru': 'PE',
    'Venezuela': 'VE',
    'Ecuador': 'EC',
    'Uruguay': 'UY',
    'Paraguay': 'PY',
    'Bolivia': 'BO',
    'Costa Rica': 'CR',
    'Panama': 'PA',
    'Jamaica': 'JM',
    'Trinidad': 'TT',
    'Bahamas': 'BS',
    'Iceland': 'IS',
    'Finland': 'FI',
    'Poland': 'PL',
    'Romania': 'RO',
    'Hungary': 'HU',
    'Czech Republic': 'CZ',
    'Slovakia': 'SK',
    'Croatia': 'HR',
    'Serbia': 'RS',
    'Slovenia': 'SI',
    'Bulgaria': 'BG',
    'Estonia': 'EE',
    'Latvia': 'LV',
    'Lithuania': 'LT',
    'Ukraine': 'UA',
    'Moldova': 'MD',
    'Belarus': 'BY',
    'Kazakhstan': 'KZ',
    'Uzbekistan': 'UZ',
    'Kyrgyzstan': 'KG',
    'Tajikistan': 'TJ',
    'Armenia': 'AM',
    'Georgia': 'GE',
    'Azerbaijan': 'AZ',
    'Cyprus': 'CY',
    'Malta': 'MT',
    'Luxembourg': 'LU',
    'Monaco': 'MC',
    'Andorra': 'AD',
    'San Marino': 'SM',
    'Vatican City': 'VA',
    'Liechtenstein': 'LI',
    'Montenegro': 'ME',
    'Albania': 'AL',
    'North Macedonia': 'MK',
    'Kosovo': 'XK',
    'Bosnia': 'BA',
    'Qatar': 'QA',
    'Kuwait': 'KW',
    'Bahrain': 'BH',
    'Oman': 'OM',
    'Jordan': 'JO',
    'Lebanon': 'LB',
    'Iraq': 'IQ',
    'Yemen': 'YE',
    'Syria': 'SY',
    'Afghanistan': 'AF',
    'Pakistan': 'PK',
    'Nepal': 'NP',
    'Bhutan': 'BT',
    'Sri Lanka': 'LK',
    'Maldives': 'MV'
}
df['CountryCode'] = df['Country'].map(CountryCode)
print(df['CountryCode'].unique())
```

```
['BD' 'IN' 'US' 'GB' 'CA' 'AU' 'DE' 'BR' 'JP' 'KR' 'FR' 'ES' 'IT' 'MX'
 'RU' 'CN' 'SE' 'NO' 'DK' 'NL' 'BE' 'CH' 'AT' 'PT' 'GR' 'IE' 'NZ' 'SG'
 'MY' 'TH' 'VN' 'PH' 'ID' 'TW' 'HK' 'TR' 'IL' 'AE' 'EG' 'MA' 'ZA' 'NG'
 'KE' 'GH' 'AR' 'CL' 'CO' 'PE' 'VE' 'EC' 'UY' 'PY' 'BO' 'CR' 'PA' 'JM'
 'TT' 'BS' 'IS' 'FI' 'PL' 'RO' 'HU' 'CZ' 'SK' 'HR' 'RS' 'SI' 'BG' 'EE'
 'LV' 'LT' 'UA' 'MD' 'BY' 'KZ' 'UZ' 'KG' 'TJ' 'AM' 'GE' 'AZ' 'CY' 'MT'
 'LU' 'MC' 'AD' 'SM' 'VA' 'LI' 'ME' 'AL' 'MK' 'XK' 'BA' 'QA' 'KW' 'BH'
 'OM' 'JO' 'LB' 'IQ' 'YE' 'SY' 'AF' 'PK' 'NP' 'BT' 'LK' 'MV']
```

```
df.sample(10)
```

```
     Student_ID  Age  Gender Academic_Level     Country  \
441         442   21    Male       Graduate     Denmark
165         166   21    Male       Graduate    Maldives
683         684   23    Male       Graduate       Italy
548         549   19  Female  Undergraduate       India
232         233   19  Female  Undergraduate       Japan
14           15   21    Male  Undergraduate      Russia
410         411   20  Female  Undergraduate       Spain
510         511   20  Female  Undergraduate      Brazil
482         483   20  Female  Undergraduate     Ireland
202         203   20  Female  Undergraduate  Bangladesh

     Avg_Daily_Usage_Hours Most_Used_Platform
Affects_Academic_Performance  \
441                    2.8           Facebook
No
165                    5.4             TikTok
Yes
683                    4.8           Facebook
No
548                    7.2           WhatsApp
Yes
232                    3.5               LINE
No
14                     3.7            YouTube
No
410                    4.3             TikTok
Yes
510                    6.1          Instagram
Yes
482                    3.3             TikTok
Yes
202                    4.3          Instagram
Yes
```

```
     Sleep_Hours_Per_Night  Mental_Health_Score Relationship_Status  \
441                    9.0                    8     In Relationship
165                    6.0                    6     In Relationship
683                    7.1                    7     In Relationship
548                    5.6                    5     In Relationship
232                    8.0                    8              Single
14                     6.8                    7     In Relationship
410                    7.6                    6              Single
510                    6.4                    6              Single
482                    8.6                    7              Single
202                    7.6                    5              Single

     Conflicts_Over_Social_Media  Addicted_Score CountryCode
441                            2               4          DK
165                            4               8          MV
683                            2               5          IT
548                            4               8          IN
232                            1               3          JP
14                             2               5          RU
410                            3               7          ES
510                            3               7          BR
482                            3               6          IE
202                            3               7          BD
```

```
country_code_col = df.pop('CountryCode')
country_index = df.columns.get_loc('Country')
df.insert(country_index + 1, 'CountryCode', country_code_col)
df.sample(10)
```

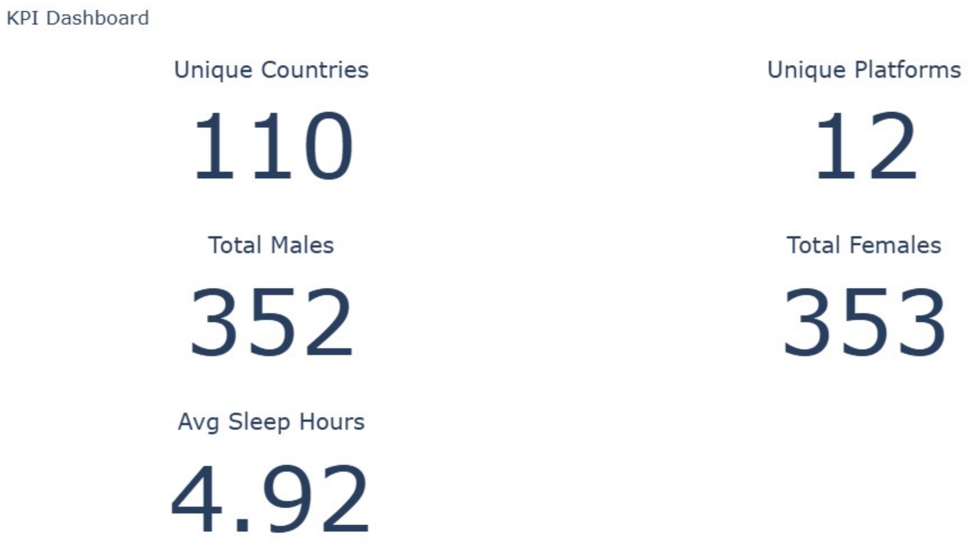
```
     Student_ID  Age  Gender Academic_Level                   Country
\
631         632   21    Male  Undergraduate            United Kingdom

62           63   20    Male  Undergraduate                   Hungary

423         424   22    Male       Graduate                     India

264         265   19  Female  Undergraduate                     Japan

571         572   23    Male       Graduate                   Denmark

602         603   23  Female       Graduate                    Poland

456         457   19  Female  Undergraduate  United States of America

64           65   23    Male       Graduate                  Slovakia

688         689   20  Female  Undergraduate                   Finland

97           98   22  Female       Graduate                   Bahrain
```

```
    CountryCode  Avg_Daily_Usage_Hours Most_Used_Platform  \
631          GB                   6.2           Facebook
62           HU                   4.2             TikTok
423          IN                   6.8           WhatsApp
264          JP                   3.3               LINE
571          DK                   3.8            Twitter
602          PL                   6.2          Instagram
456          US                   8.1          Instagram
64           SK                   2.3           LinkedIn
688          FI                   4.4          Instagram
97           BH                   2.8           LinkedIn

    Affects_Academic_Performance  Sleep_Hours_Per_Night
Mental_Health_Score  \
631                          Yes                    6.3
5
62                           Yes                    6.0
6
423                          Yes                    5.5
5
264                           No                    8.3
8
571                           No                    7.8
8
602                          Yes                    6.4
5
456                          Yes                    4.2
5
64                            No                    7.4
8
688                           No                    7.4
7
97                            No                    7.1
8

    Relationship_Status  Conflicts_Over_Social_Media  Addicted_Score
631              Single                            4               8
62          Complicated                            3               7
423     In Relationship                            4               8
264              Single                            1               3
571     In Relationship                            2               4
602              Single                            4               8
456     In Relationship                            4               9
64      In Relationship                            1               3
688     In Relationship                            2               5
97          Complicated                            1               4
```

Cleaned and standardized the dataset by correcting country names, mapping them to country codes, and exploring key categorical variables.
Removed inconsistencies, verified uniqueness, and reordered columns for improved data structure and readability.

Key Performance Indicator

```python
import plotly.graph_objects as go

unique_countries = df['Country'].nunique()
unique_platforms = df['Most_Used_Platform'].nunique()
male_count = (df['Gender'] == 'Male').sum()
female_count = (df['Gender'] == 'Female').sum()
avg_sleep = round(df['Avg_Daily_Usage_Hours'].mean(), 2)

fig = go.Figure()

fig.add_trace(go.Indicator(
    mode="number",
    value=unique_countries,
    title={"text": "Unique Countries"},
    domain={'row': 0, 'column': 0}
))

fig.add_trace(go.Indicator(
    mode="number",
    value=unique_platforms,
    title={"text": "Unique Platforms"},
    domain={'row': 0, 'column': 1}
))


fig.add_trace(go.Indicator(
    mode="number",
    value=male_count,
    title={"text": "Total Males"},
    domain={'row': 1, 'column': 0}
))


fig.add_trace(go.Indicator(
    mode="number",
    value=female_count,
    title={"text": "Total Females"},
    domain={'row': 1, 'column': 1}
))


fig.add_trace(go.Indicator(
    mode="number",
    value=avg_sleep,
    title={"text": "Avg Sleep Hours"},
    domain={'row': 2, 'column': 0}
))

fig.update_layout(
    grid={'rows': 3, 'columns': 2, 'pattern': "independent"},
    height=600,
    template="plotly_white",
    title="KPI Dashboard"
)

fig.show()
```



KPI Dashboard

Unique Countries

110

Unique Platforms

12

Total Males

352

Total Females

353

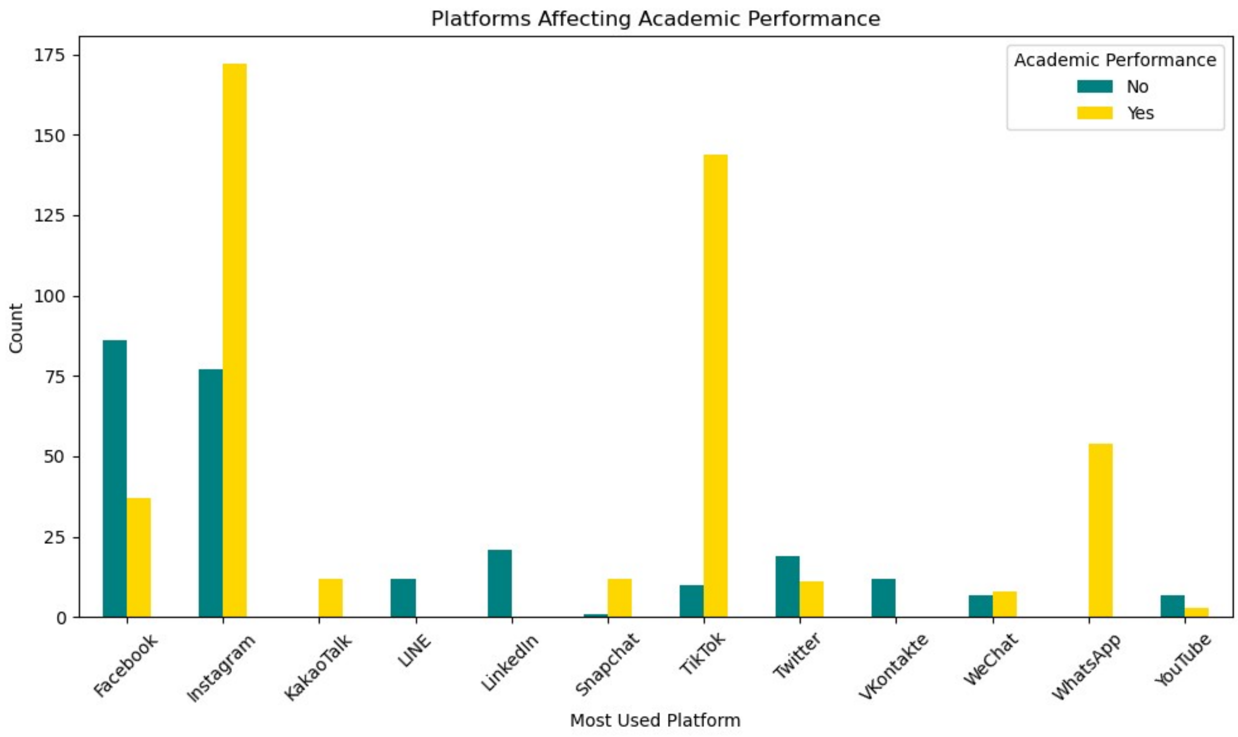
Avg Sleep Hours

4.92

Exploratory Data Analysis (EDA)

Platforms Affecting Academic Performance

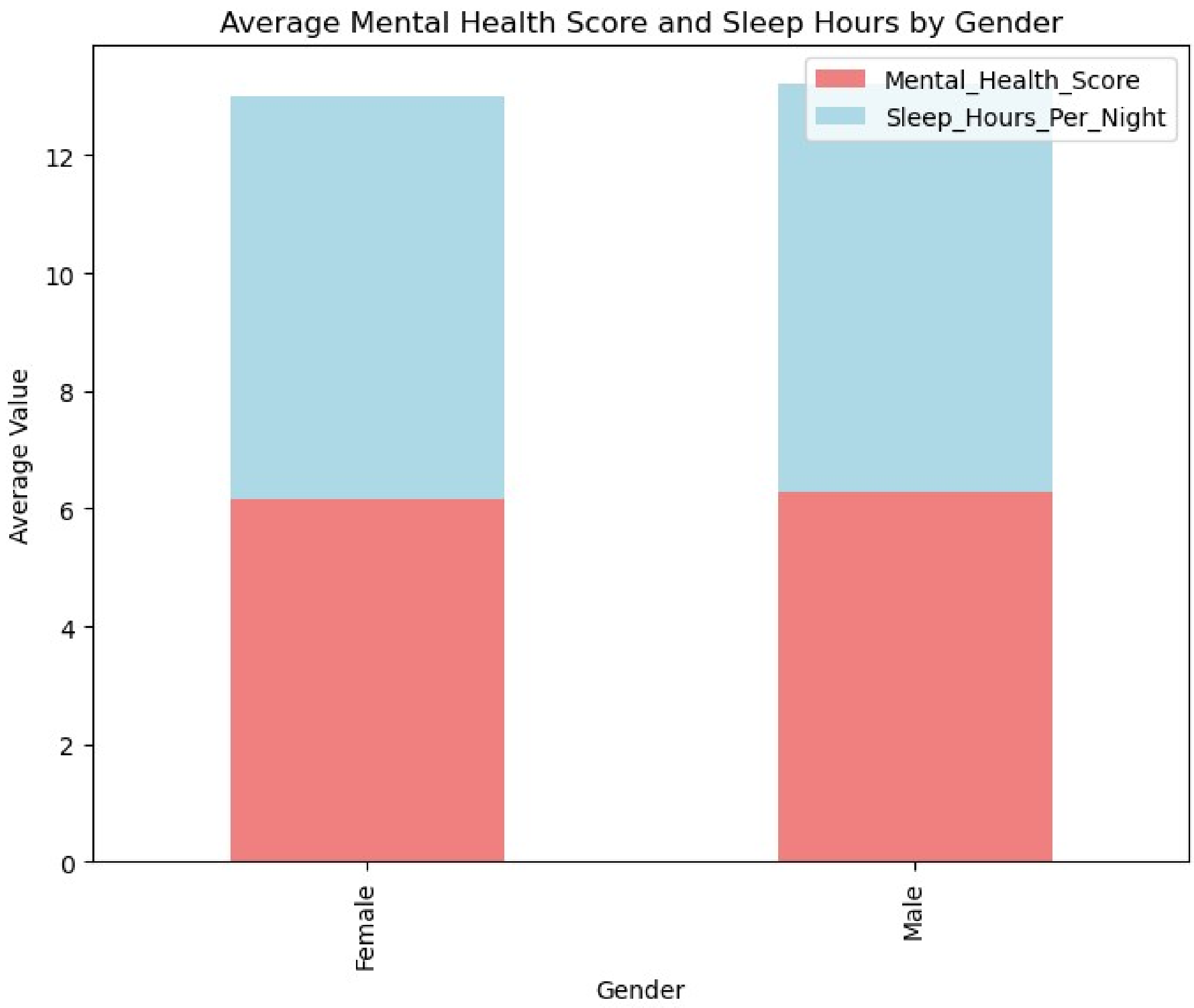
```
cross_tab = pd.crosstab(df['Most_Used_Platform'],
df['Affects_Academic_Performance'])
cross_tab.plot(kind='bar', figsize=(10,6), color=['teal', 'gold'])

plt.title('Platforms Affecting Academic Performance')
plt.xlabel('Most Used Platform')
plt.ylabel('Count')
plt.xticks(rotation=45)
plt.legend(title='Academic Performance')
plt.tight_layout()
plt.show()
```



This bar chart compares how academic performance is affected across different social media platforms. It shows the count of students per platform categorized by their reported academic impact.

Mental Health score by gender

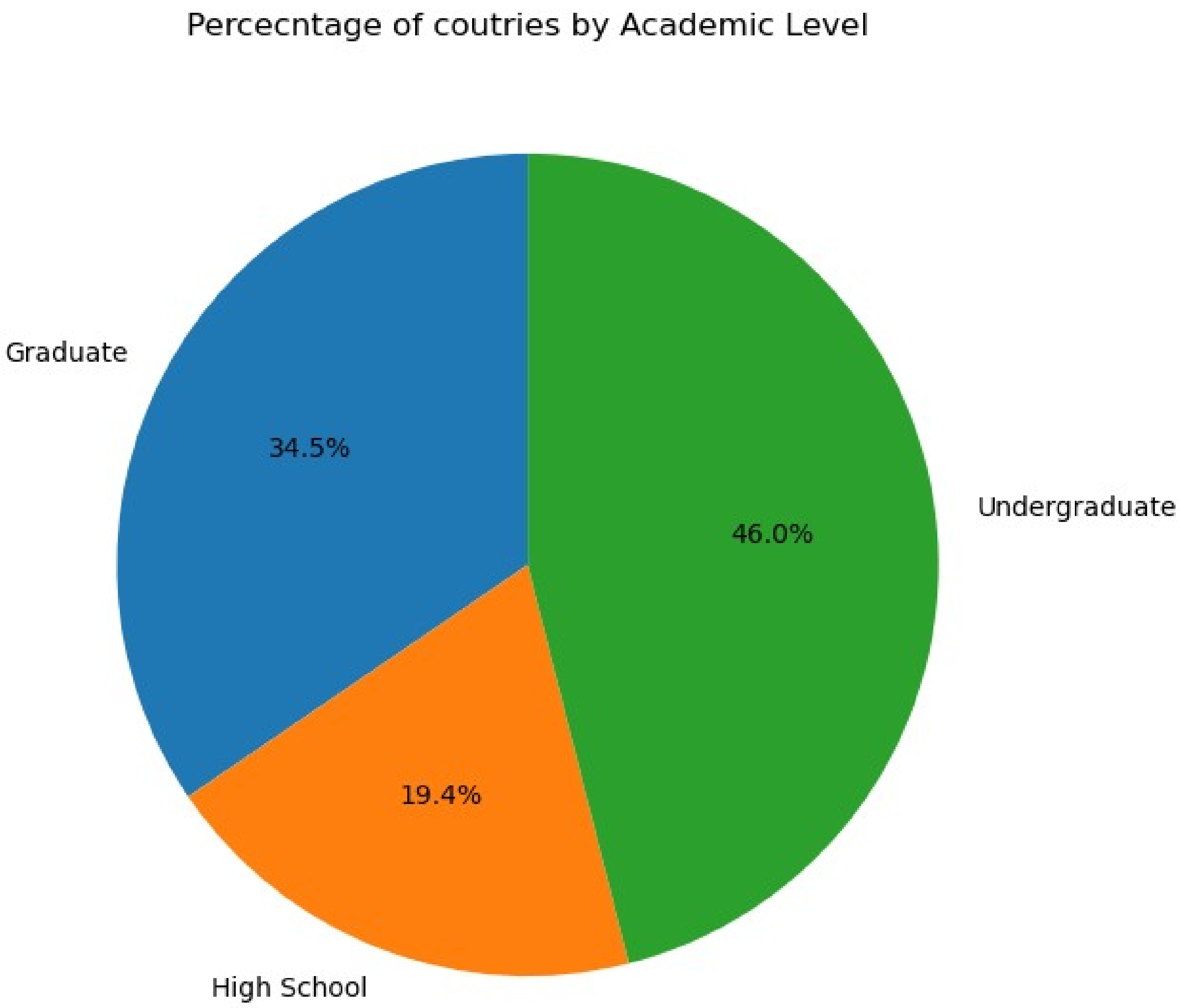
```
grouped = df.groupby('Gender')[['Mental_Health_Score',
'Sleep_Hours_Per_Night']].mean()

grouped.plot(kind='bar', stacked=True, figsize=(8,6),
color=['lightcoral', 'lightblue'])
plt.title('Average Mental Health Score and Sleep Hours by Gender')
plt.xlabel('Gender')
plt.ylabel('Average Value')
plt.show()
```



This stacked bar chart shows the average mental health scores and sleep hours for each gender. It highlights differences in well-being and rest patterns between male and female students.

Countries by Academic Level

```
country_counts_per_level = df.groupby('Academic_Level')
['Country'].nunique()

plt.figure(figsize=(7,7))
country_counts_per_level.plot(kind='pie', autopct='%1.1f%%',
startangle=90)
plt.title('Percecntage of coutries by Academic Level')
plt.ylabel('')
plt.show()
```



This pie chart shows the percentage of countries that have students in each academic level. It highlights how widely each academic level is represented across different countries.