In [ ]:
```
# pip install numpy
# pip install pandas
# pip install matplotlib
# pip install seaborn
```

In [6]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [12]:
```
df = pd.read_csv(r"C:\Users\goswa\OneDrive\Documents\MY PROJECTS\archive (1)
```

In [20]:
```
import os

os.getcwd()

os.chdir(r"C:\Users\goswa\OneDrive\Documents\MY PROJECTS\archive (1)/")
```

In [28]:
```
df = pd.read_csv("student_scores.csv")
print(df.head())
```

```
   Unnamed: 0  Gender EthnicGroup          ParentEduc     LunchType TestPrep
\
0           0  female         NaN   bachelor's degree      standard     none
1           1  female     group C        some college      standard      NaN
2           2  female     group B     master's degree      standard     none
3           3    male     group A  associate's degree  free/reduced     none
4           4    male     group C        some college      standard     none

  ParentMaritalStatus PracticeSport IsFirstChild  NrSiblings TransportMeans
\
0             married     regularly          yes         3.0     school_bus
1             married     sometimes          yes         0.0            NaN
2              single     sometimes          yes         4.0     school_bus
3             married         never           no         1.0            NaN
4             married     sometimes          yes         0.0     school_bus

  WklyStudyHours  MathScore  ReadingScore  WritingScore
0            < 5         71            71            74
1        5 - 10         69            90            88
2            < 5         87            93            91
3        5 - 10         45            56            42
4        5 - 10         76            78            75
```

In [30]:
```
df.describe()
```

Out[30]:

| | Unnamed: 0 | NrSiblings | MathScore | ReadingScore | WritingScore |
|---|---|---|---|---|---|
| **count** | 30641.000000 | 29069.000000 | 30641.000000 | 30641.000000 | 30641.000000 |
| **mean** | 499.556607 | 2.145894 | 66.558402 | 69.377533 | 68.418622 |
| **std** | 288.747894 | 1.458242 | 15.361616 | 14.758952 | 15.443525 |
| **min** | 0.000000 | 0.000000 | 0.000000 | 10.000000 | 4.000000 |
| **25%** | 249.000000 | 1.000000 | 56.000000 | 59.000000 | 58.000000 |
| **50%** | 500.000000 | 2.000000 | 67.000000 | 70.000000 | 69.000000 |
| **75%** | 750.000000 | 3.000000 | 78.000000 | 80.000000 | 79.000000 |
| **max** | 999.000000 | 7.000000 | 100.000000 | 100.000000 | 100.000000 |

In [32]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 30641 entries, 0 to 30640
Data columns (total 15 columns):
 #   Column               Non-Null Count  Dtype  
---  ------               --------------  -----  
 0   Unnamed: 0           30641 non-null  int64  
 1   Gender               30641 non-null  object 
 2   EthnicGroup          28801 non-null  object 
 3   ParentEduc           28796 non-null  object 
 4   LunchType            30641 non-null  object 
 5   TestPrep             28811 non-null  object 
 6   ParentMaritalStatus  29451 non-null  object 
 7   PracticeSport        30010 non-null  object 
 8   IsFirstChild         29737 non-null  object 
 9   NrSiblings           29069 non-null  float64
 10  TransportMeans       27507 non-null  object 
 11  WklyStudyHours       29686 non-null  object 
 12  MathScore            30641 non-null  int64  
 13  ReadingScore         30641 non-null  int64  
 14  WritingScore         30641 non-null  int64  
dtypes: float64(1), int64(4), object(10)
memory usage: 3.5+ MB
```

In [36]:
```
df.isnull().sum()
```

Out[36]:
```
Unnamed: 0               0
Gender                   0
EthnicGroup           1840
ParentEduc            1845
LunchType                0
TestPrep              1830
ParentMaritalStatus   1190
PracticeSport          631
IsFirstChild           904
NrSiblings            1572
TransportMeans        3134
WklyStudyHours         955
MathScore                0
ReadingScore             0
WritingScore             0
dtype: int64
```

# Drop Unname column

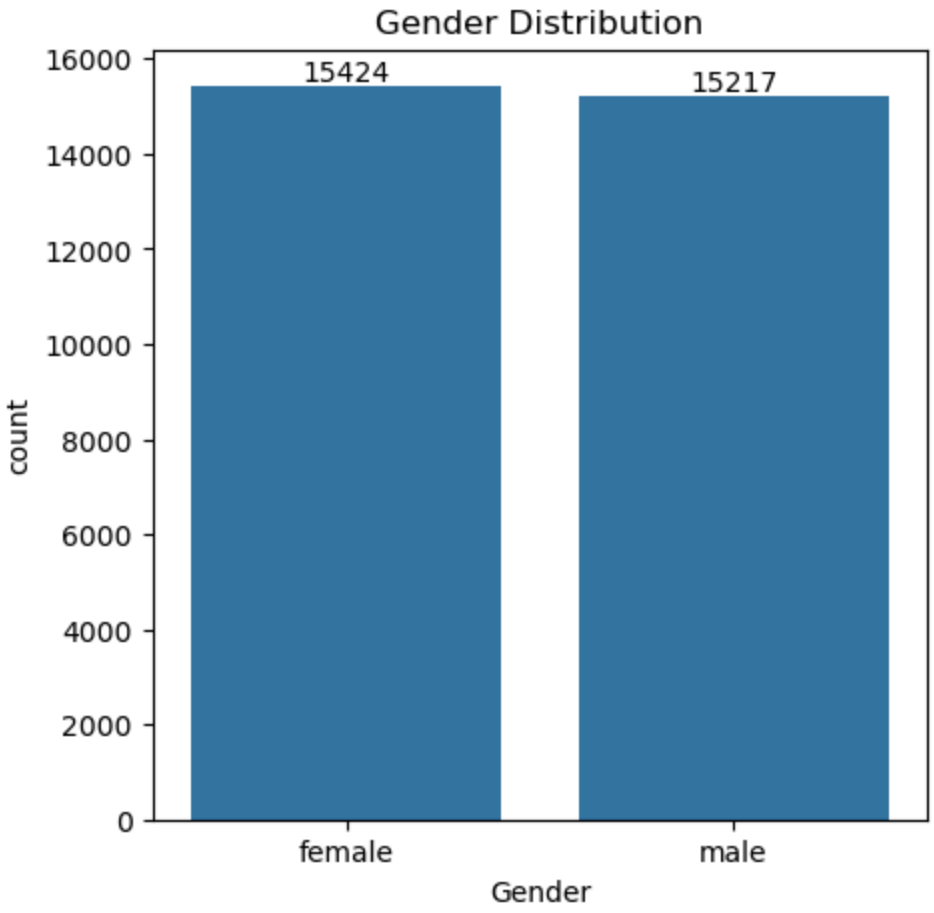
In [47]:
```
df = df.drop("Unnamed: 0", axis = 1)
print(df.head())
```

```
   Gender EthnicGroup          ParentEduc     LunchType TestPrep  \
0  female         NaN   bachelor's degree      standard     none
1  female     group C        some college      standard      NaN
2  female     group B     master's degree      standard     none
3    male     group A  associate's degree  free/reduced     none
4    male     group C        some college      standard     none

  ParentMaritalStatus PracticeSport IsFirstChild  NrSiblings TransportMeans
\
0             married     regularly          yes         3.0     school_bus
1             married     sometimes          yes         0.0            NaN
2              single     sometimes          yes         4.0     school_bus
3             married         never           no         1.0            NaN
4             married     sometimes          yes         0.0     school_bus

  WklyStudyHours  MathScore  ReadingScore  WritingScore
0            < 5         71            71            74
1        5 - 10         69            90            88
2            < 5         87            93            91
3        5 - 10         45            56            42
4        5 - 10         76            78            75
```

# Gender Distribution

In [103…
```
plt.figure(figsize =(5,5))
ax = sns.countplot(data = df, x = "Gender")
ax.bar_label(ax.containers[0])
plt.title("Gender Distribution")
plt.show
```

Out[103… <function matplotlib.pyplot.show(close=None, block=None)>

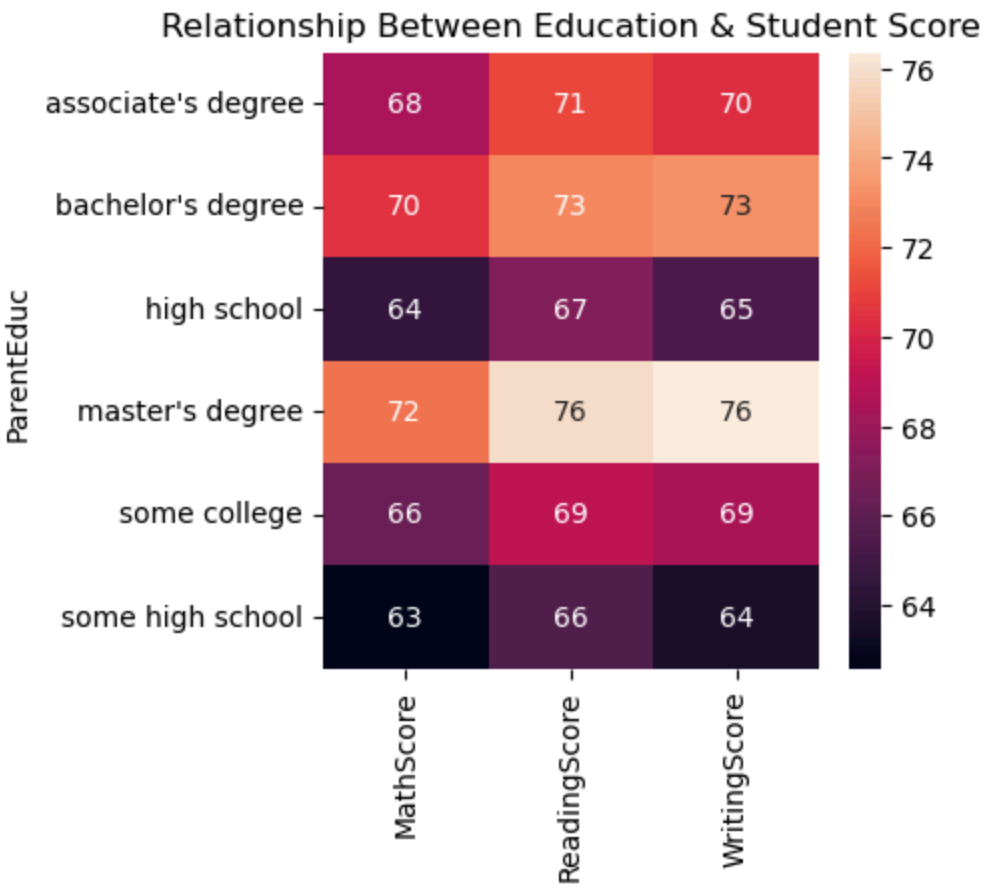



In [ ]:
```
#from the above chart we have analyzed that
# the numbers of female is in the data is more then the number of males
```

In [83]:
```
gb = df.groupby("ParentEduc").agg({"MathScore":'mean',"ReadingScore":"mean",
print(gb)
```

```
                   MathScore  ReadingScore  WritingScore
ParentEduc
associate's degree  68.365586     71.124324     70.299099
bachelor's degree   70.466627     73.062020     73.331069
high school         64.435731     67.213997     65.421136
master's degree     72.336134     75.832921     76.356896
some college        66.390472     69.179708     68.501432
some high school    62.584013     65.510785     63.632409
```

In [105…
```
plt.figure(figsize =(4,4))
sns.heatmap(gb, annot = True)
plt.title("Relationship Between Education & Student Score")
plt.show()
```

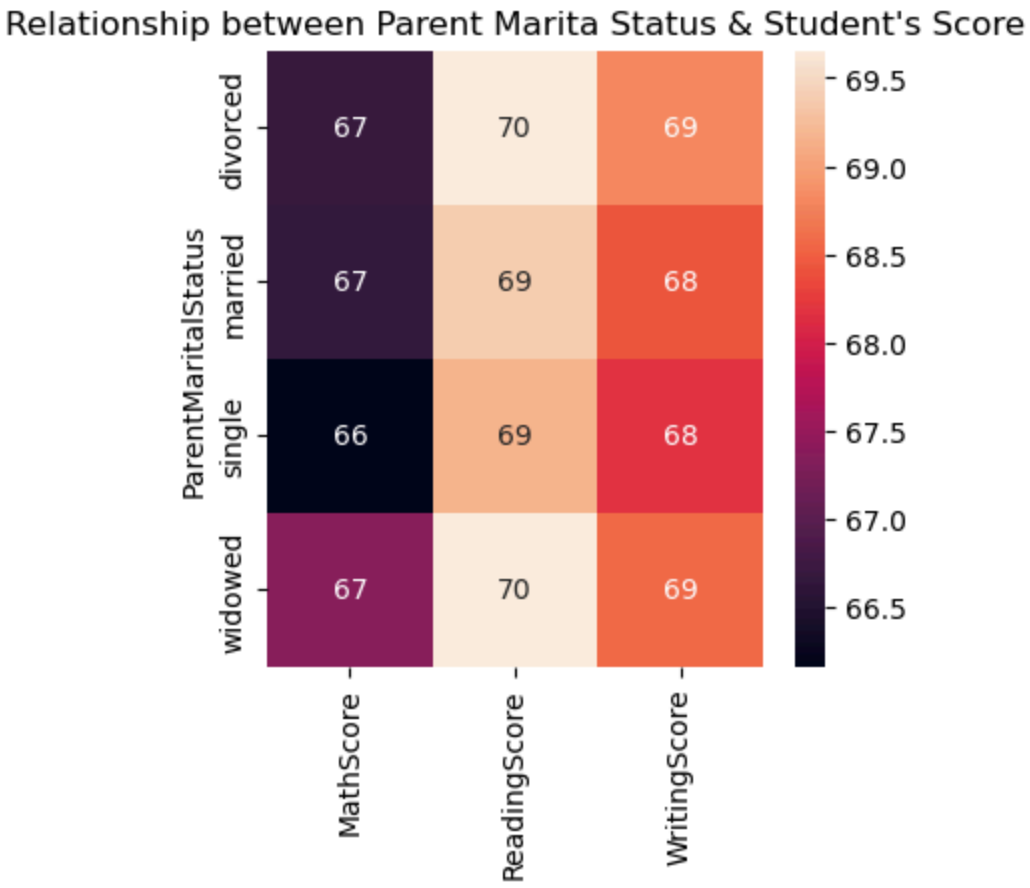



In [ ]:
```
#from the above chart we have calculated that the ducation of the parent hav
```

In [97]:
```
gb1 = df.groupby("ParentMaritalStatus").agg({"MathScore":'mean',"ReadingScor
print(gb1)
```

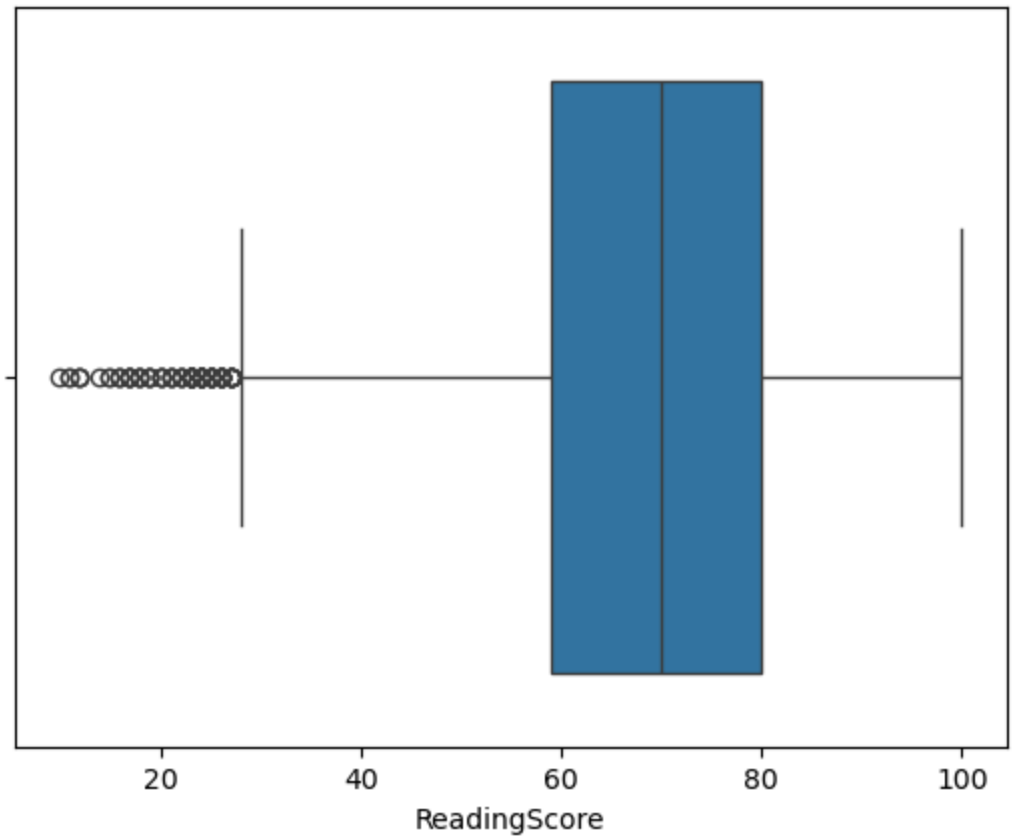
```
                    MathScore  ReadingScore  WritingScore
ParentMaritalStatus
divorced            66.691197     69.655011     68.799146
married             66.657326     69.389575     68.420981
single              66.165704     69.157250     68.174440
widowed             67.368866     69.651438     68.563452
```

In [107…
```
plt.figure(figsize = (4,4))
sns.heatmap(gb1,annot = True)
plt.title("Relationship between Parent Marita Status & Student's Score")
plt.show()
```



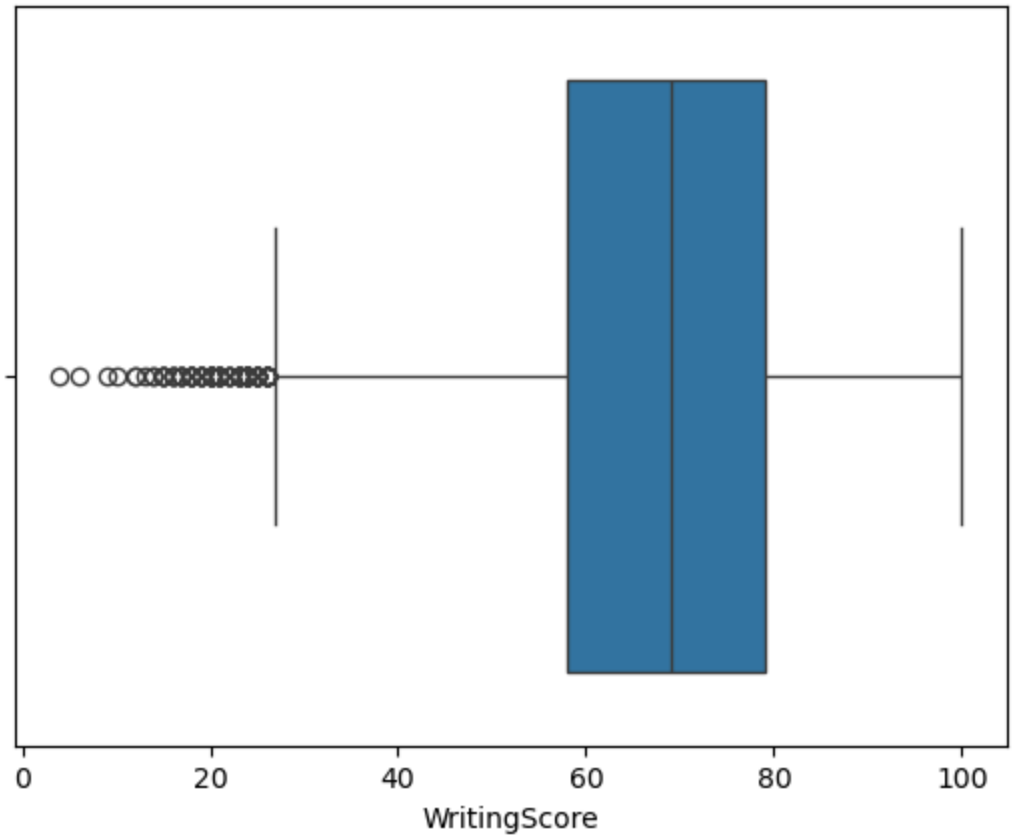

In [ ]:
```
# from the above chart we have calculated that there are no/negligible impac
# due to their marital status
```

In [126…
```
sns.boxplot(data = df, x = "ReadingScore")
plt.show()
```

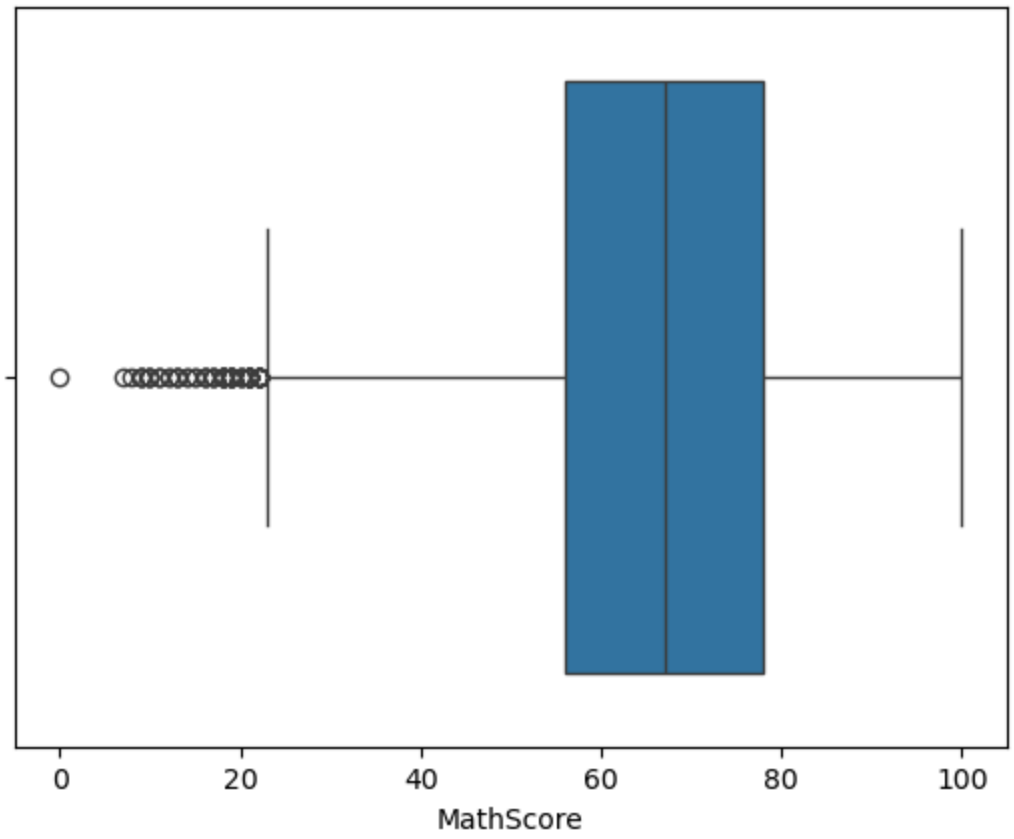



In [128…

```
sns.boxplot(data = df, x = "WritingScore")
plt.show()
```



In [130…
```
sns.boxplot(data = df, x = "MathScore")
plt.show()
```



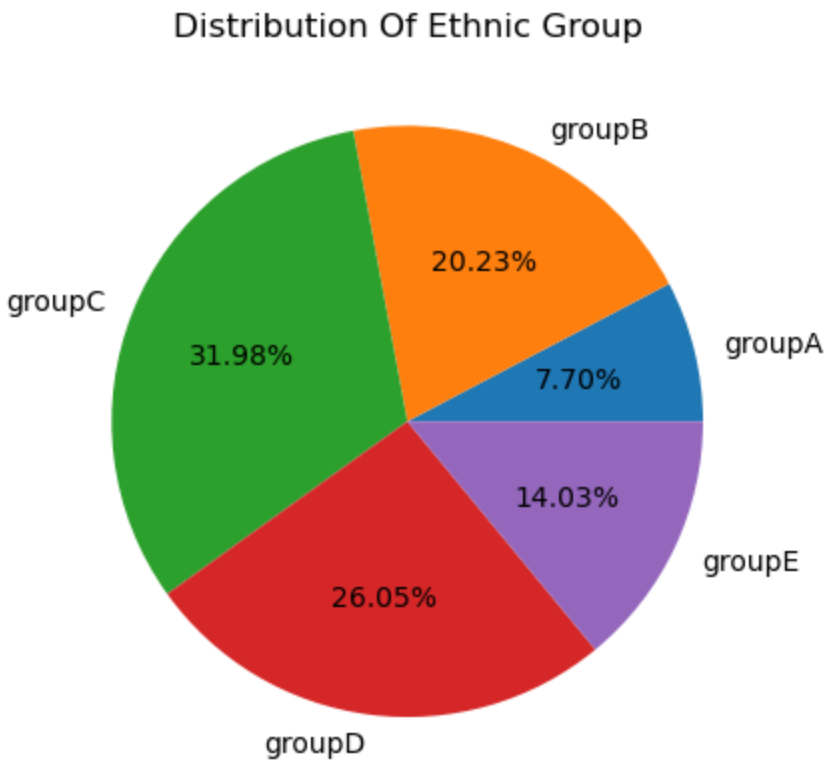

In [134…
```
print(df["EthnicGroup"].unique())
```

```
[nan 'group C' 'group B' 'group A' 'group D' 'group E']
```

# Distribution Of Ethnic Group

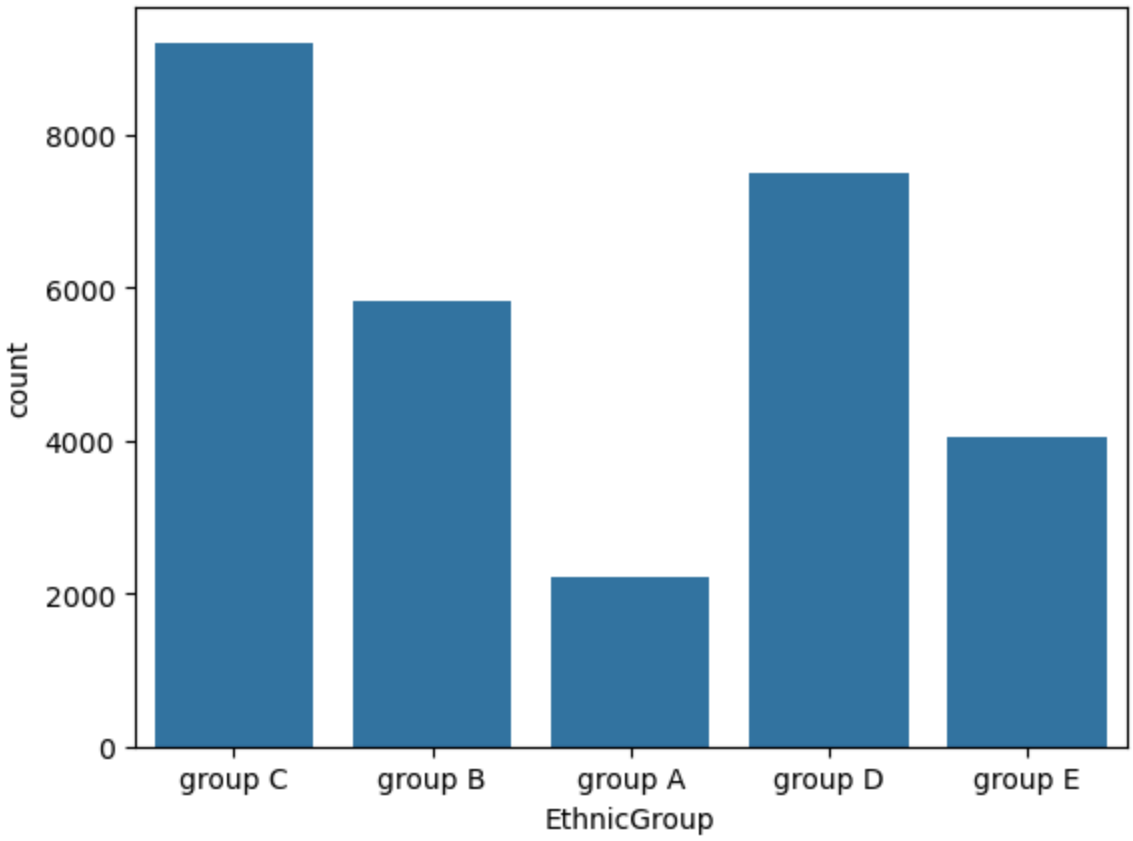
In [161…
```
groupA = df.loc[(df['EthnicGroup'] == "group A")].count()
groupB = df.loc[(df['EthnicGroup'] == "group B")].count()
groupC = df.loc[(df['EthnicGroup'] == "group C")].count()
groupD = df.loc[(df['EthnicGroup'] == "group D")].count()
groupE = df.loc[(df['EthnicGroup'] == "group E")].count()


l = ["groupA", "groupB", "groupC", "groupD", "groupE"]
mlist = [groupA["EthnicGroup"], groupB["EthnicGroup"], groupC["EthnicGroup"]
plt.pie(mlist, labels = l, autopct = "%1.2f%%")
plt.title("Distribution Of Ethnic Group")
plt.show()
```

```
[2219, 5826, 9212, 7503, 4041]
```




In [159…
```
sns.countplot(data = df, x= 'EthnicGroup')
ax.bar_label(ax.containers[0])
```

Out[159…
```
[Text(0, 0, '15424'), Text(0, 0, '15217')]
```



In [ ]:

In [ ]: