Student Performance dataset

Importng Important libararies

In [2]:

```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline
import warnings
warnings.filterwarnings('ignore')
```

Importing CSV as dataframe

In [3]:

```
df = pd.read_csv('StudentsPerformance.csv')
```

In [4]:

```
#Checking records, first 5
df.head()
```

Out[4]:

	gender	race/ethnicity	parental level of education	lunch	test preparation course	math score	reading score	writing score
0	female	group B	bachelor's degree	standard	none	72	72	74
1	female	group C	some college	standard	completed	69	90	88
2	female	group B	master's degree	standard	none	90	95	93
3	male	group A	associate's degree	free/reduced	none	47	57	44
4	male	group C	some college	standard	none	76	78	75

In [5]:

```
df.shape
```

Out[5]:

```
(1000, 8)
```

Dataset information

1.gender : sex of students -> (Male/female)

2.race/ethnicity : ethnicity of students -> (Group A, B,C, D,E)

3.parental level of education : parents' final education ->(bachelor's degree,some college,master's degree,associate's

4.degree,high school)

5.lunch : having lunch before test (standard or free/reduced)

6.test preparation course : complete or not complete before test

7.math score

8.writing score

In [6]:

```
#checking missing values
df.isna().sum()
```

Out[6]:

```
gender                         0
race/ethnicity                 0
parental level of education    0
lunch                          0
test preparation course        0
math score                     0
reading score                  0
writing score                  0
dtype: int64
```

There are no missing values in the dataset

In [7]:

```
#checking duplicate values
df.duplicated().sum()
```

Out[7]:

```
0
```

There are no duplicate values in the dataset

In [8]:

```
#checking datatypes
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1000 entries, 0 to 999
Data columns (total 8 columns):
 #   Column                       Non-Null Count  Dtype 
---  ------                       --------------  ----- 
 0   gender                       1000 non-null   object
 1   race/ethnicity               1000 non-null   object
 2   parental level of education  1000 non-null   object
 3   lunch                        1000 non-null   object
 4   test preparation course      1000 non-null   object
 5   math score                   1000 non-null   int64 
 6   reading score                1000 non-null   int64 
 7   writing score                1000 non-null   int64 
dtypes: int64(3), object(5)
memory usage: 62.6+ KB
```

In [9]:

```
#checking the uniques values in the dataset
df.nunique()
```

Out[9]:

```
gender                          2
race/ethnicity                  5
parental level of education     6
lunch                           2
test preparation course         2
math score                     81
reading score                  72
writing score                  77
dtype: int64
```

In [10]:

```
#checking the statistica of the data
df.describe()
```

Out[10]:

	math score	reading score	writing score
count	1000.00000	1000.000000	1000.000000

	math score	reading score	writing score
mean	66.08900	69.169000	68.054000
std	15.16308	14.600192	15.195657
min	0.00000	17.000000	10.000000
25%	57.00000	59.000000	57.750000
50%	66.00000	70.000000	69.000000
75%	77.00000	79.000000	79.000000
max	100.00000	100.000000	100.000000

Insights

- Men for math score, reading score and writing score are nearly equal, between 66 to 70.
- minimum values for math is 0 , reading scores is 17 and writing scores is 10 approx.
- SD for math score, reading score and writing score is almost rqual for all three numerical column

Data Exploration

In [11]:

```
df.head()
```

Out[11]:

	gender	race/ethnicity	parental level of education	lunch	test preparation course	math score	reading score	writing score
0	female	group B	bachelor's degree	standard	none	72	72	74
1	female	group C	some college	standard	completed	69	90	88
2	female	group B	master's degree	standard	none	90	95	93
3	male	group A	associate's degree	free/reduced	none	47	57	44
4	male	group C	some college	standard	none	76	78	75

In [12]:

```
print(f"Categories in gender : {df['gender'].unique()}")
print(f"Categories in race/ethnicity : {df['race/ethnicity'].unique()}")
print(f"Categories in parental level of education : {df['parental level of education'].uni
print(f"Categories in lunch : {df['lunch'].unique()}")
print(f"Categories in test preparation course : {df['test preparation course'].unique()}")
```

```
Categories in gender : ['female' 'male']
Categories in race/ethnicity : ['group B' 'group C' 'group A' 'group D' 'group E']
Categories in parental level of education : ["bachelor's degree" 'some college' "master's
degree" "associate's degree"
 'high school' 'some high school']
Categories in lunch : ['standard' 'free/reduced']
Categories in test preparation course : ['none' 'completed']
```

In [13]:

```
# Segrregating numericl and categoricl columns

numerical_columns = [feature for feature in df.columns if df[feature].dtypes!='O']
calegorical_columns = [feature for feature in df.columns if df[feature].dtypes=='O']

#getting values, features
```

```
print(f" numerical columns {len(numerical_columns)} :{numerical_columns}")
print(f" calegorical columns {len(calegorical_columns)} :{calegorical_columns}")
```

```
 numerical columns 3 :['math score', 'reading score', 'writing score']
 calegorical columns 5 :['gender', 'race/ethnicity', 'parental level of education', 'lunc
h', 'test preparation course']
```

Increasing features to get more features, may get better accuracy in modeling stage

In [14]:

```
df['total_score']=df['math score']+df['reading score']+df['writing score']
df['average']=df['total_score']/3
df.head()
```

Out[14]:

	gender	race/ethnicity	parental level of education	lunch	test preparation course	math score	reading score	writing score	total_score	average
0	female	group B	bachelor's degree	standard	none	72	72	74	218	72.666667
1	female	group C	some college	standard	completed	69	90	88	247	82.333333
2	female	group B	master's degree	standard	none	90	95	93	278	92.666667
3	male	group A	associate's degree	free/reduced	none	47	57	44	148	49.333333
4	male	group C	some college	standard	none	76	78	75	229	76.333333

How many students got full marks on their respective categories

In [15]:

```
maths_full = df[df['math score']==100]['average'].count()
reading_full = df[df['reading score']==100]['average'].count()
writing_full = df[df['writing score']==100]['average'].count()

print(f"Number of students with full marks in maths: {maths_full}")
print(f"Number of students with full marks in reading: {reading_full}")
print(f"Number of students with full marks in writing: {writing_full}")
```

```
Number of students with full marks in maths: 7
Number of students with full marks in reading: 17
Number of students with full marks in writing: 14
```

How many students got less than 20 in respective categories

In [16]:

```
maths_less_20 = df[df['math score']<=20]['average'].count()
reading_less_20 = df[df['reading score']<=20]['average'].count()
writing_less_20 = df[df['writing score']<=20]['average'].count()

print(f"Number of students with less than 20 marks in maths: {maths_less_20}")
print(f"Number of students with less than 20 marks in reading: {reading_less_20}")
print(f"Number of students with less than 20 marks in writing: {writing_less_20}")
```

```
Number of students with less than 20 marks in maths: 4
Number of students with less than 20 marks in reading: 1
Number of students with less than 20 marks in writing: 3
```

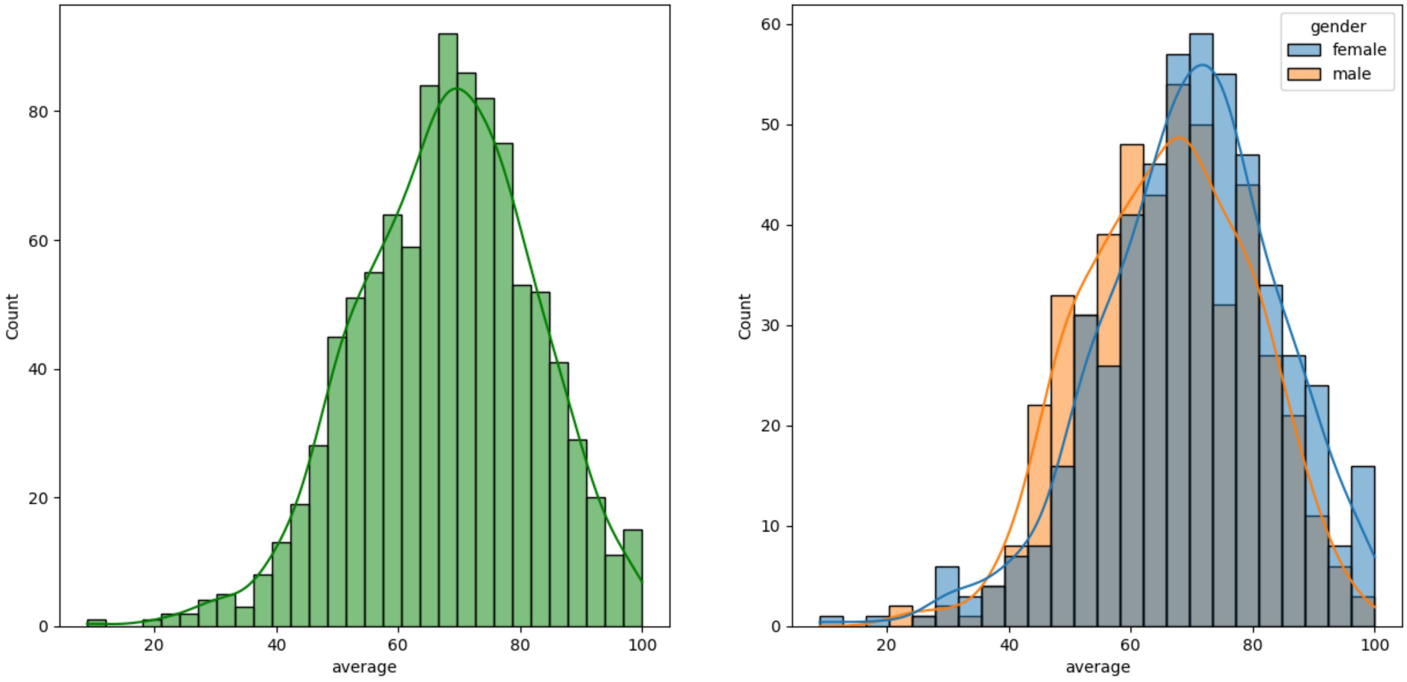
Insights

-Students performed well in reading section and worst in maths

Data visualization

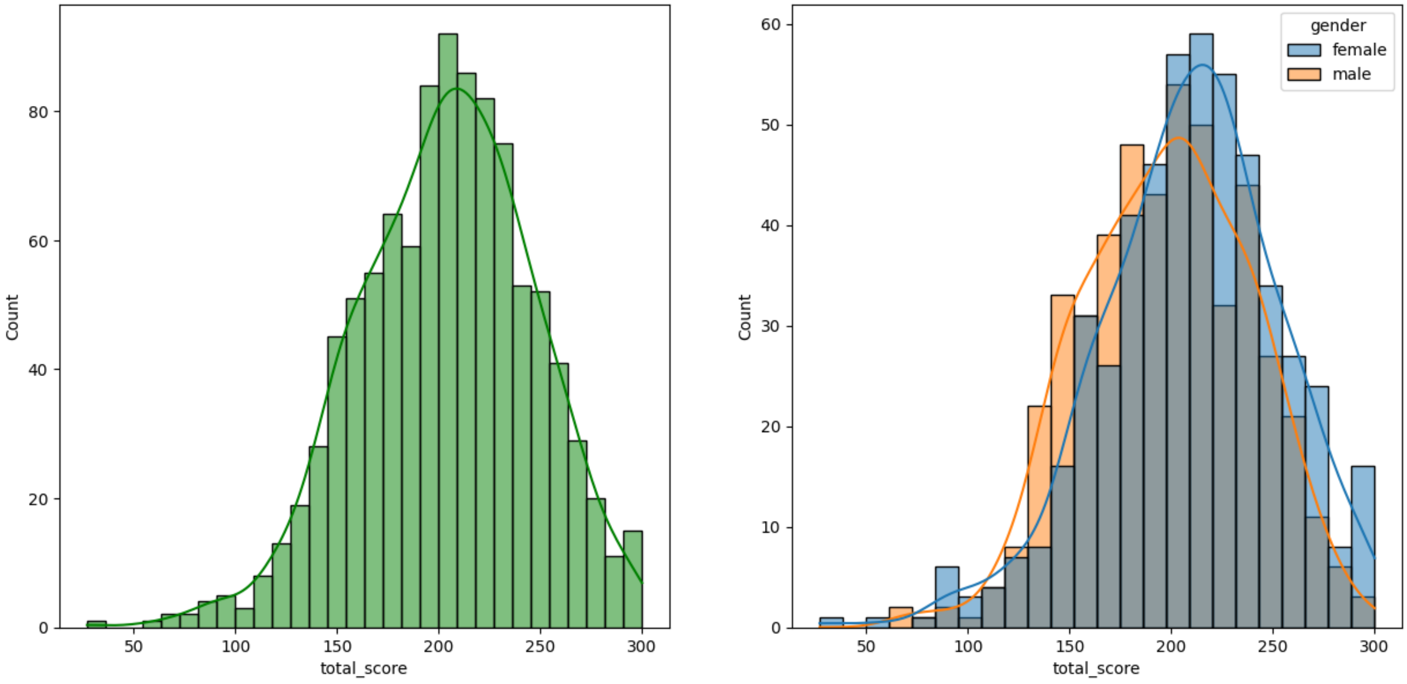
In [17]:

```
#checking avearge and total score got by students w.r.t gender

fig,axs=plt.subplots(1,2,figsize=(15,7))
plt.subplot(121)
sns.histplot(data=df,x='average',bins=30,kde=True,color='g')
plt.subplot(122)
sns.histplot(data=df,x='average',kde=True,hue='gender')
plt.show()
```



In [18]:

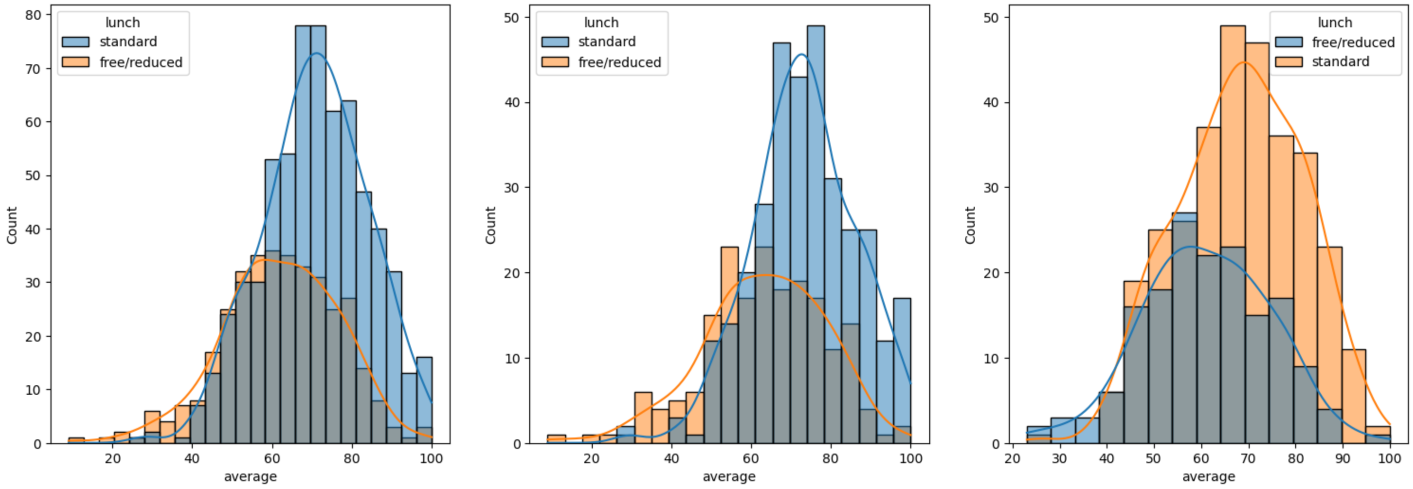
```
fig,axs=plt.subplots(1,2,figsize=(15,7))
plt.subplot(121)
sns.histplot(data=df,x='total_score',bins=30,kde=True,color='g')
plt.subplot(122)
sns.histplot(data=df,x='total_score',kde=True,hue='gender')
plt.show()
```



Insight: In terms of avearge and total score female students seems to attain good scores than male counterpart

In [19]:

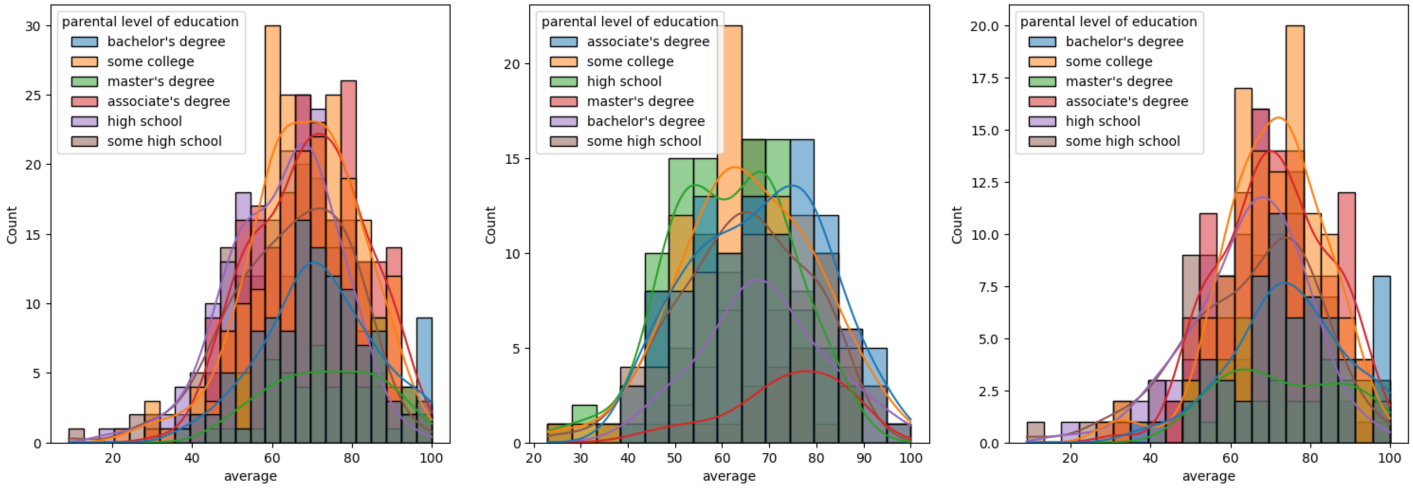
```
# score comparing w.r.t lunch

plt.subplots(1,3,figsize=(25,6))
plt.subplot(141)
sns.histplot(data=df,x='average',kde=True,hue='lunch')
plt.subplot(142)
sns.histplot(data=df[df.gender=='female'],x='average',kde=True,hue='lunch')
plt.subplot(143)
sns.histplot(data=df[df.gender=='male'],x='average',kde=True,hue='lunch')
plt.show()
```



Insight : Standard luch boost the male and female in scoring good marks

In [20]:

```
# scores with respect to parent edu

plt.subplots(1,3,figsize=(25,6))
plt.subplot(141)
ax =sns.histplot(data=df,x='average',kde=True,hue='parental level of education')
plt.subplot(142)
ax =sns.histplot(data=df[df.gender=='male'],x='average',kde=True,hue='parental level of ec
plt.subplot(143)
ax =sns.histplot(data=df[df.gender=='female'],x='average',kde=True,hue='parental level of
plt.show()
```

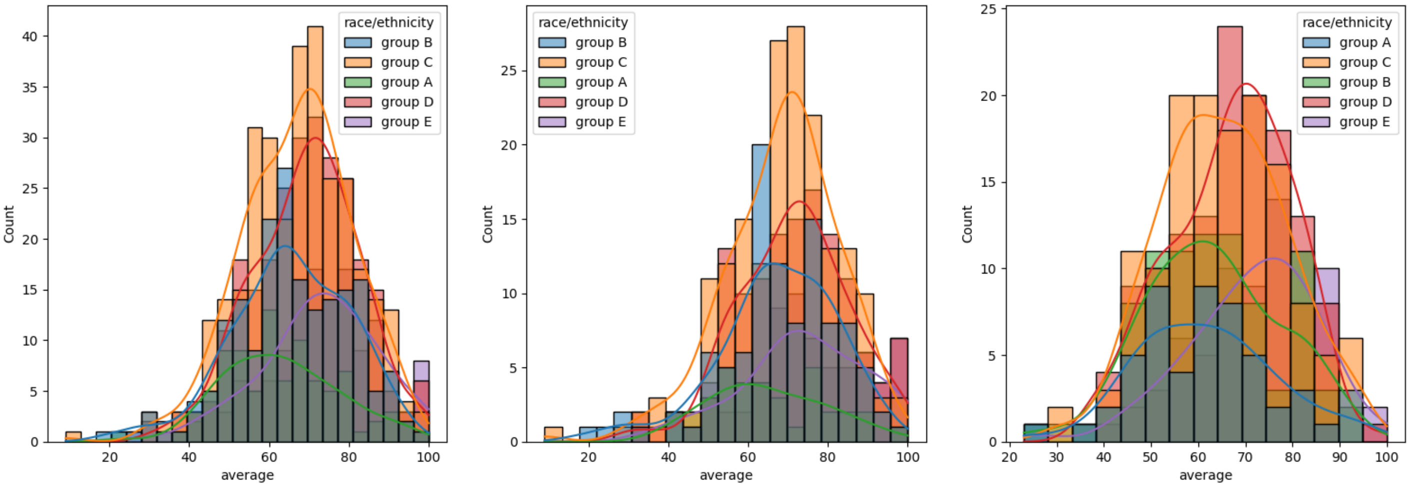


Insight:

```
Parents with associate degree or some degree gives a positive feedback
in males and females parents with some degree tends to give some positive results.
```

In [21]:

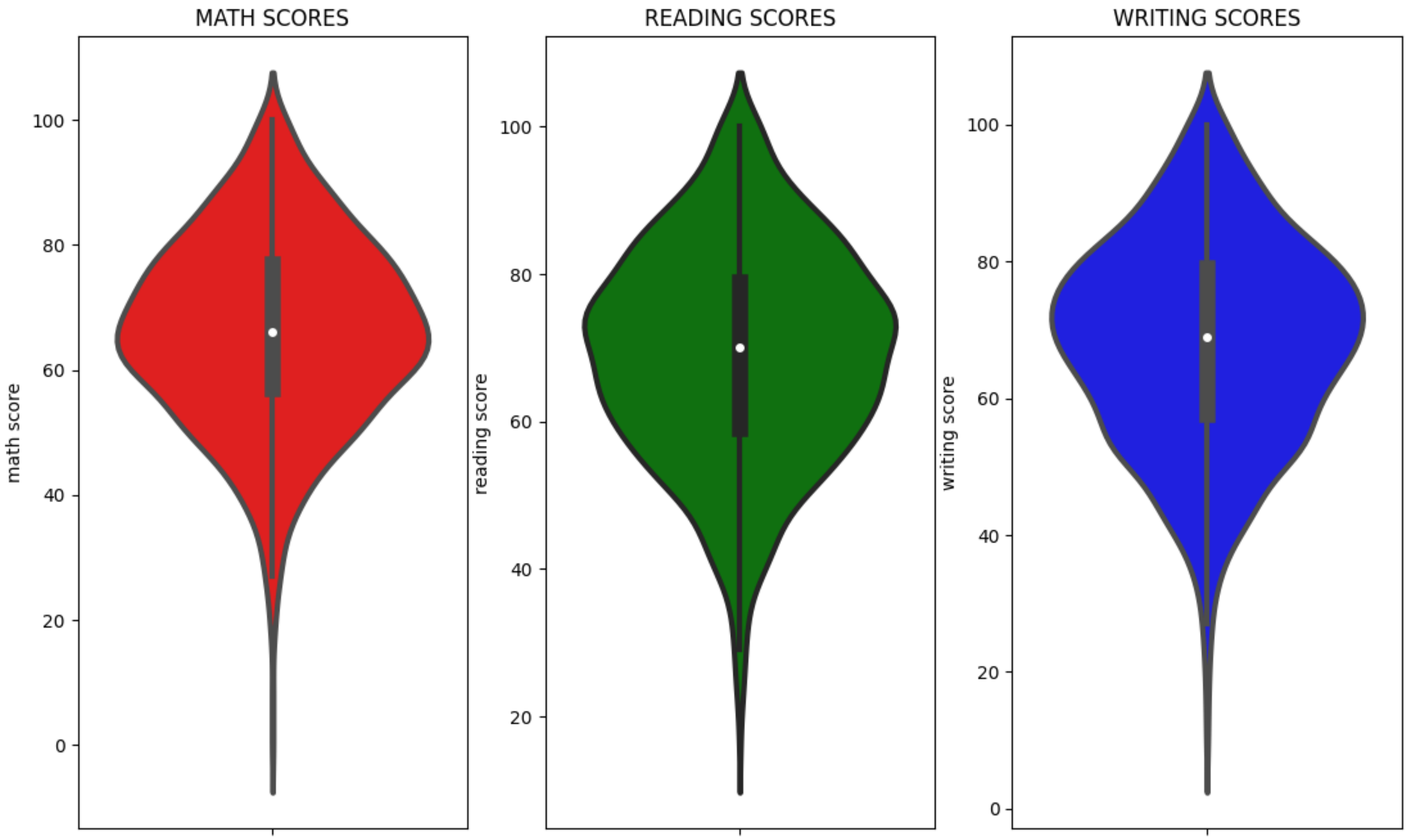
```
#scores w.r.t race/ethnecity

plt.subplots(1,3,figsize=(25,6))
plt.subplot(141)
ax =sns.histplot(data=df,x='average',kde=True,hue='race/ethnicity')
plt.subplot(142)
ax =sns.histplot(data=df[df.gender=='female'],x='average',kde=True,hue='race/ethnicity')
plt.subplot(143)
ax =sns.histplot(data=df[df.gender=='male'],x='average',kde=True,hue='race/ethnicity')
plt.show()
```



Insight: Overall it seems group C race scores good marks. In males also group c have a positive feedback while in females group c and D are dominant

In [22]:

```
#comparing all three subjects

plt.figure(figsize=(18,8))
plt.subplot(1, 4, 1)
plt.title('MATH SCORES')
sns.violinplot(y='math score',data=df,color='red',linewidth=3)
plt.subplot(1, 4, 2)
plt.title('READING SCORES')
sns.violinplot(y='reading score',data=df,color='green',linewidth=3)
plt.subplot(1, 4, 3)
plt.title('WRITING SCORES')
sns.violinplot(y='writing score',data=df,color='blue',linewidth=3)
plt.show()
```



Insight: we can see from above distribution that in maths most of the students scored between 60-80, while in reading and writing 50-80

Multivariate analysis

In [23]:

```
df.head(2)
```

Out[23]:

	gender	race/ethnicity	parental level of education	lunch	test preparation course	math score	reading score	writing score	total_score	average
0	female	group B	bachelor's degree	standard	none	72	72	74	218	72.666667
1	female	group C	some college	standard	completed	69	90	88	247	82.333333

In [24]:

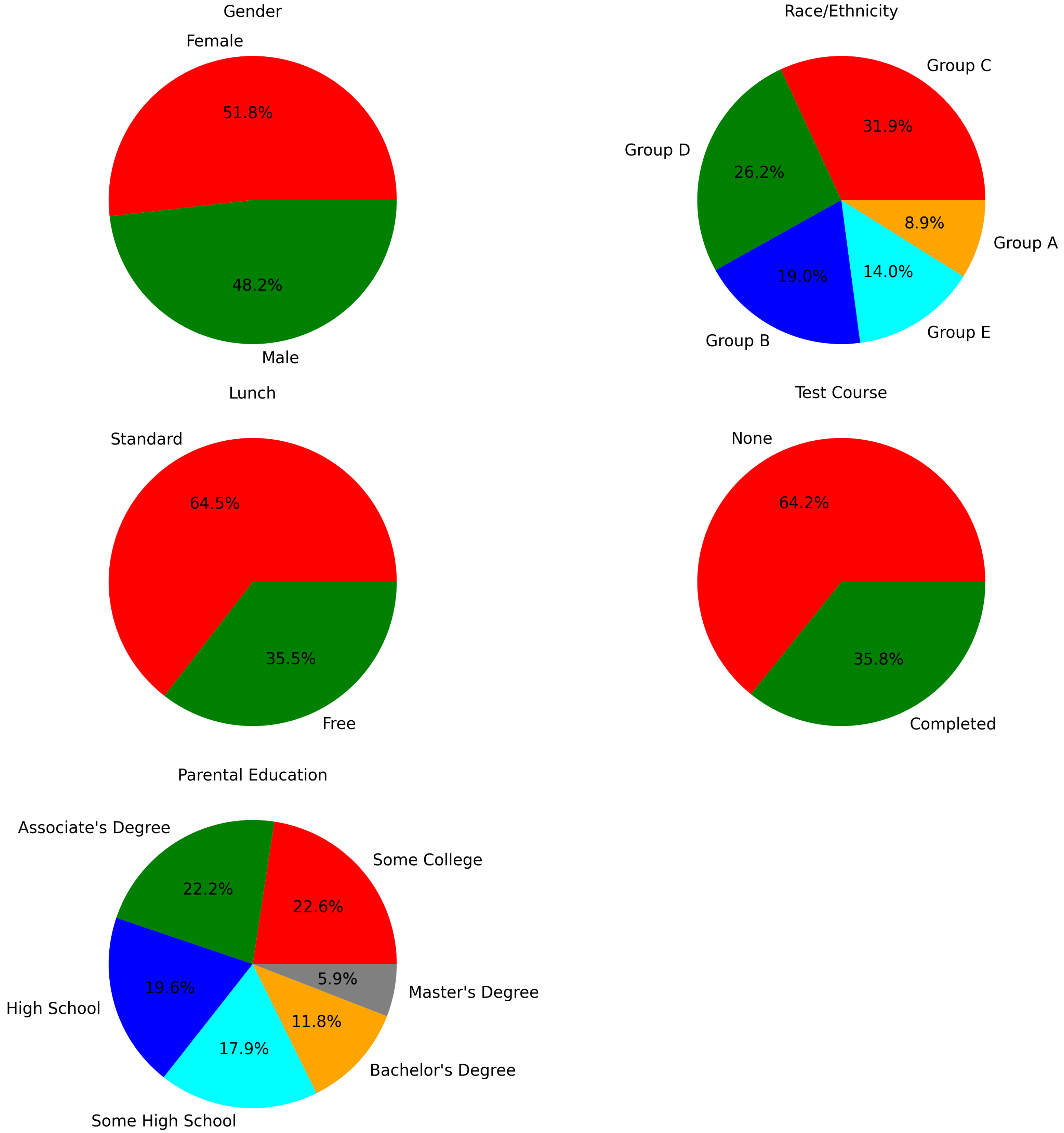
```
print(f"Categories in gender : {df['gender'].unique()}")
print(f"Categories in race/ethnicity : {df['race/ethnicity'].unique()}")
print(f"Categories in parental level of education : {df['parental level of education'].uni
print(f"Categories in lunch : {df['lunch'].unique()}")
print(f"Categories in test preparation course : {df['test preparation course'].unique()}")
```

```
Categories in gender : ['female' 'male']
Categories in race/ethnicity : ['group B' 'group C' 'group A' 'group D' 'group E']
Categories in parental level of education : ["bachelor's degree" 'some college' "master's
degree" "associate's degree"
 'high school' 'some high school']
Categories in lunch : ['standard' 'free/reduced']
Categories in test preparation course : ['none' 'completed']
```

In [25]:

```
plt.rcParams['figure.figsize'] = (30, 30)
textprops = {"fontsize":30}
```

```
plt.subplot(3, 2,1)
size = df['gender'].value_counts()
labels = 'Female', 'Male'
color = ['red','green']


plt.pie(size, colors = color, labels = labels,autopct = '%2.1f%%',textprops =textprops)
plt.title('Gender', fontsize = 30)
plt.axis('off')



plt.subplot(3,2,2)
size = df['race/ethnicity'].value_counts()
labels = 'Group C', 'Group D','Group B','Group E','Group A'
color = ['red', 'green', 'blue', 'cyan','orange']

plt.pie(size, colors = color,labels = labels,autopct = '%2.1f%%',textprops =textprops)
plt.title('Race/Ethnicity', fontsize = 30)
plt.axis('off')



plt.subplot(3,2,3)
size = df['lunch'].value_counts()
labels = 'Standard', 'Free'
color = ['red','green']

plt.pie(size, colors = color,labels = labels,autopct = '%2.1f%%',textprops =textprops)
plt.title('Lunch', fontsize = 30)
plt.axis('off')


plt.subplot(3,2,4)
size = df['test preparation course'].value_counts()
labels = 'None', 'Completed'
color = ['red','green']

plt.pie(size, colors = color,labels = labels,autopct = '%2.1f%%',textprops =textprops)
plt.title('Test Course', fontsize = 30)
plt.axis('off')


plt.subplot(3,2,5)
size = df['parental level of education'].value_counts()
labels = 'Some College', "Associate's Degree",'High School','Some High School',"Bachelor's
color = ['red', 'green', 'blue', 'cyan','orange','grey']

plt.pie(size, colors = color,labels = labels,autopct = '%2.1f%%',textprops =textprops)
plt.title('Parental Education', fontsize = 30)
plt.axis('off')


plt.tight_layout()
plt.grid()

plt.show()
```



Insight:

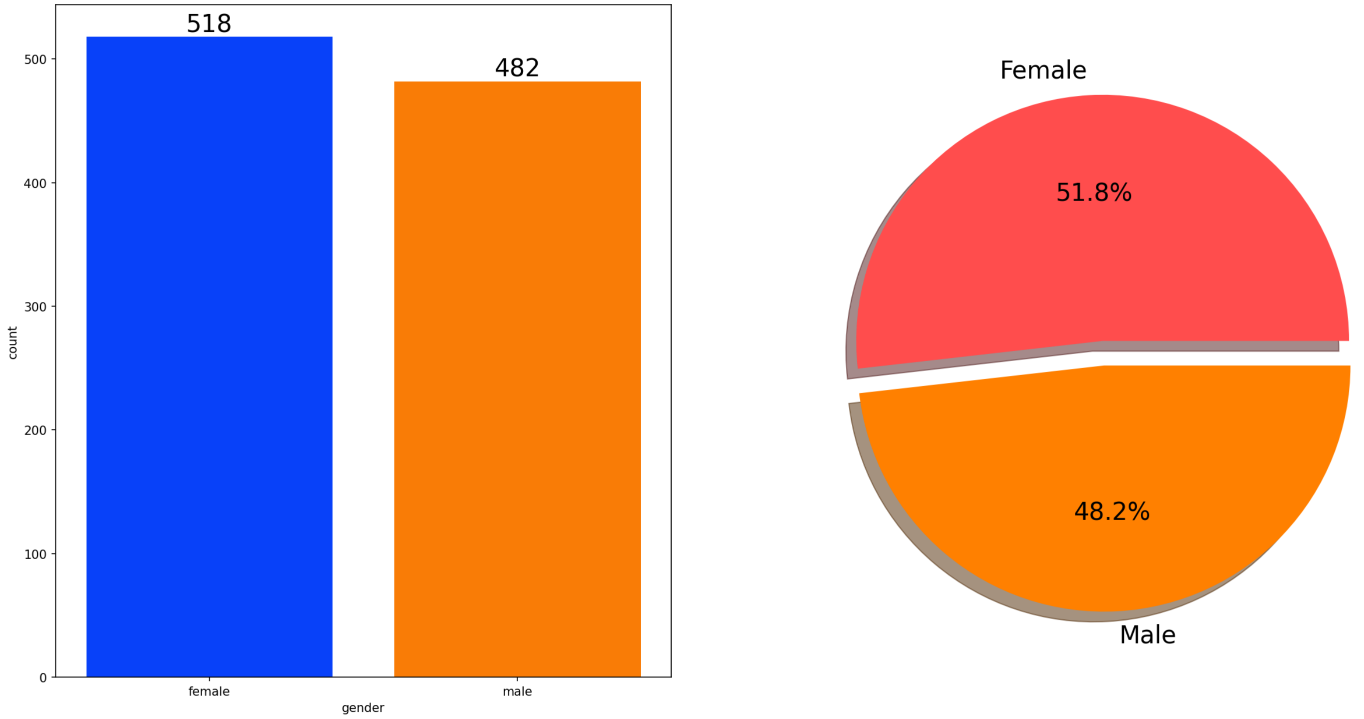
```
Male and female are same in number

Grop C has more number of students

standard lunch consumer are more

students opted for no test are more

some degree and associate degree parets are more than oter qualification
```

Distribution - Gender Univariate and bivariate

analysis

In [26]:

```
f,ax=plt.subplots(1,2,figsize=(20,10),dpi=150)
sns.countplot(x=df['gender'],data=df,palette='bright',ax=ax[0],saturation=0.95)

for container in ax[0].containers:
    ax[0].bar_label(container,color='black',size=20)

plt.pie(x=df['gender'].value_counts(),labels=['Female','Male'],explode=[0,0.1],autopct='%1
plt.show()
```



Data is balanced Male- 48.2%,518 and Female - 51.8%,482

In [27]:

```
#bivariate analysis based on gender
gender_group = df.groupby('gender').mean()
```

In [28]:

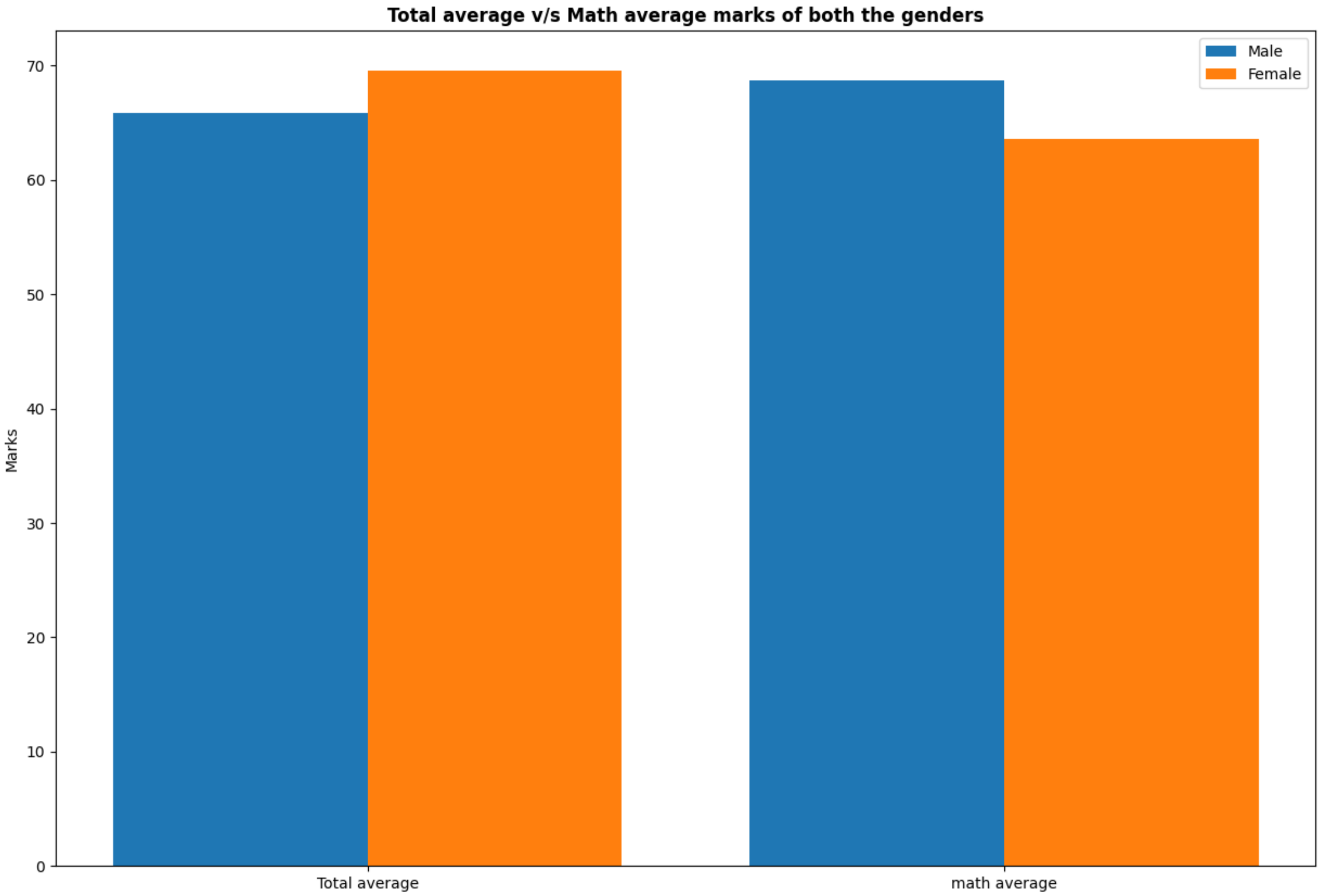
```
gender_group
```

Out[28]:

	math score	reading score	writing score	total_score	average
gender					
female	63.633205	72.608108	72.467181	208.708494	69.569498
male	68.728216	65.473029	63.311203	197.512448	65.837483

In [29]:

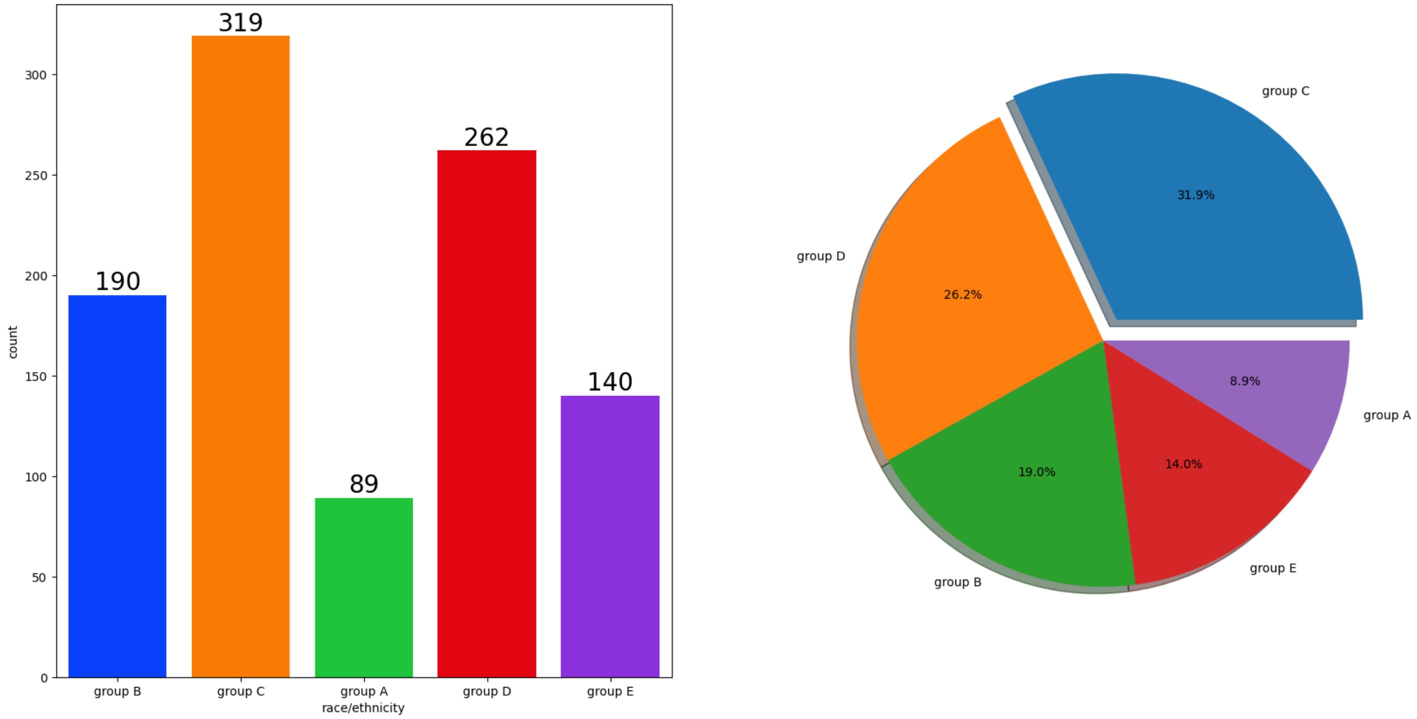
```
plt.figure(figsize=(15,10))

X = ['Total average','math average']

female_scores = [gender_group['average'][0],gender_group['math score'][0]]
male_scores = [gender_group['average'][1],gender_group['math score'][1]]

X_axis= np.arange(len(X))

plt.bar(X_axis-0.2,male_scores,0.4,label='Male')
plt.bar(X_axis+0.2,female_scores,0.4,label='Female')

plt.xticks(X_axis,X)
plt.ylabel("Marks")
plt.title("Total average v/s Math average marks of both the genders", fontweight='bold')
plt.legend()
plt.show()
```



Univariate and bivariate analysis - race/ethnicity

In [30]:

```
f,ax=plt.subplots(1,2,figsize=(20,10))
sns.countplot(x=df['race/ethnicity'],data=df,palette = 'bright',ax=ax[0],saturation=0.95)
for container in ax[0].containers:
    ax[0].bar_label(container,color='black',size=20)

plt.pie(x = df['race/ethnicity'].value_counts(),labels=df['race/ethnicity'].value_counts()
plt.show()
```



Insight:

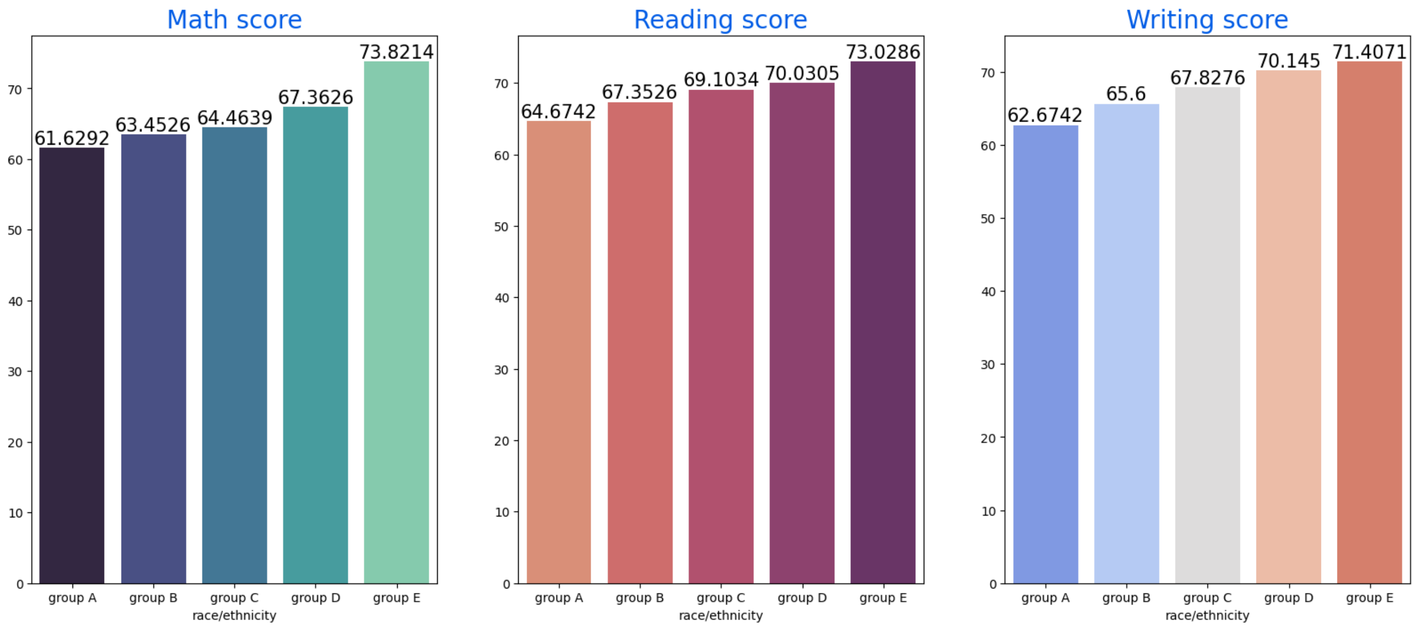
```
Group c and D have more represemtation in racewise

group A is lowlest
```

In [31]:

```
#bivariate analysis w.r.t race/ethnicity
```

In [32]:

```
Group_data2=df.groupby('race/ethnicity')
f,ax=plt.subplots(1,3,figsize=(20,8))
sns.barplot(x=Group_data2['math score'].mean().index,y=Group_data2['math score'].mean().va
ax[0].set_title('Math score',color='#005ce6',size=20)

for container in ax[0].containers:
    ax[0].bar_label(container,color='black',size=15)

sns.barplot(x=Group_data2['reading score'].mean().index,y=Group_data2['reading score'].mea
ax[1].set_title('Reading score',color='#005ce6',size=20)

for container in ax[1].containers:
    ax[1].bar_label(container,color='black',size=15)

sns.barplot(x=Group_data2['writing score'].mean().index,y=Group_data2['writing score'].mea
ax[2].set_title('Writing score',color='#005ce6',size=20)

for container in ax[2].containers:
    ax[2].bar_label(container,color='black',size=15)
```



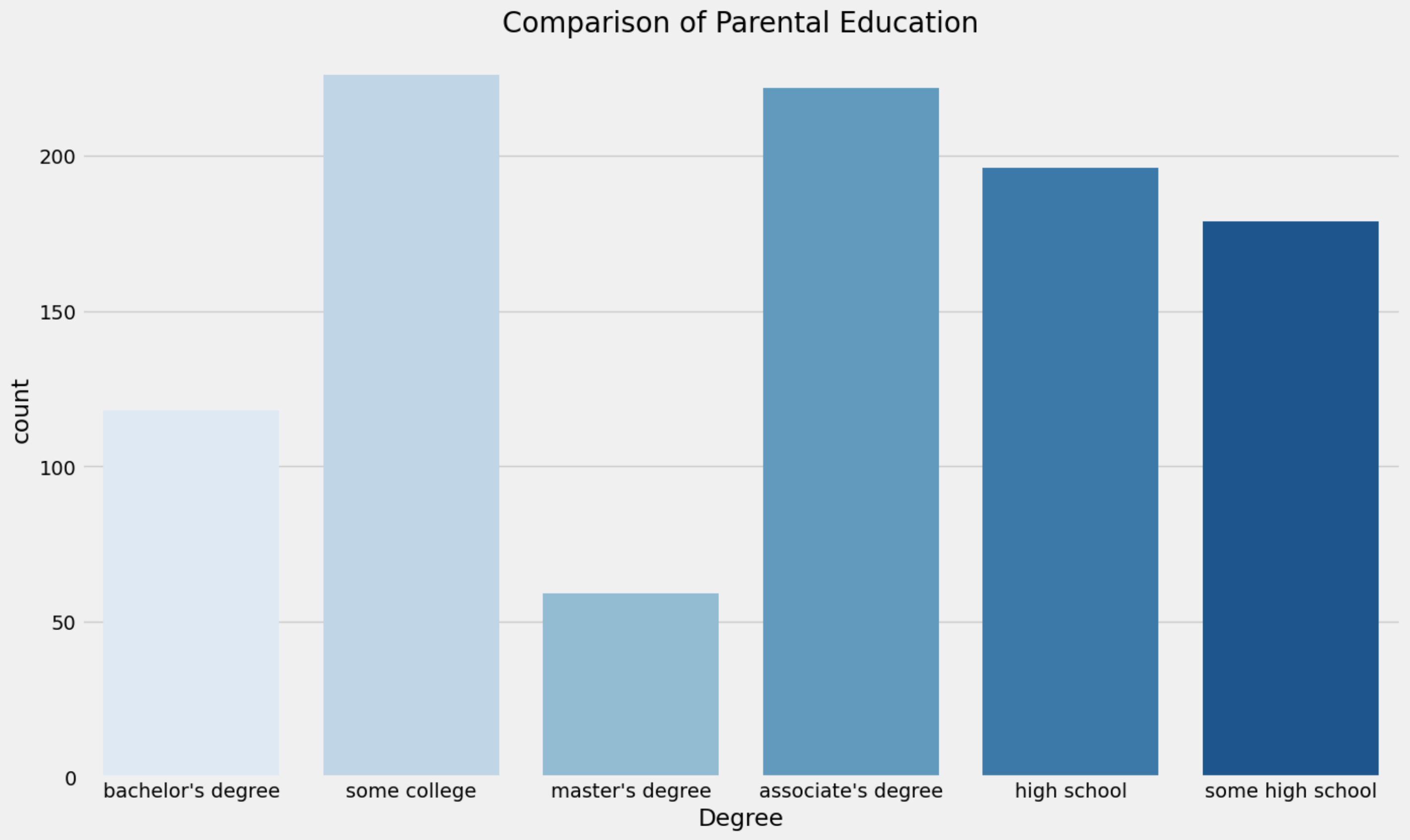
Insight:

```
Group E performed well in math, reading and writing

Group A performed low in all
```

Univariate and bivariate analysis - Parental level of education

In [37]:

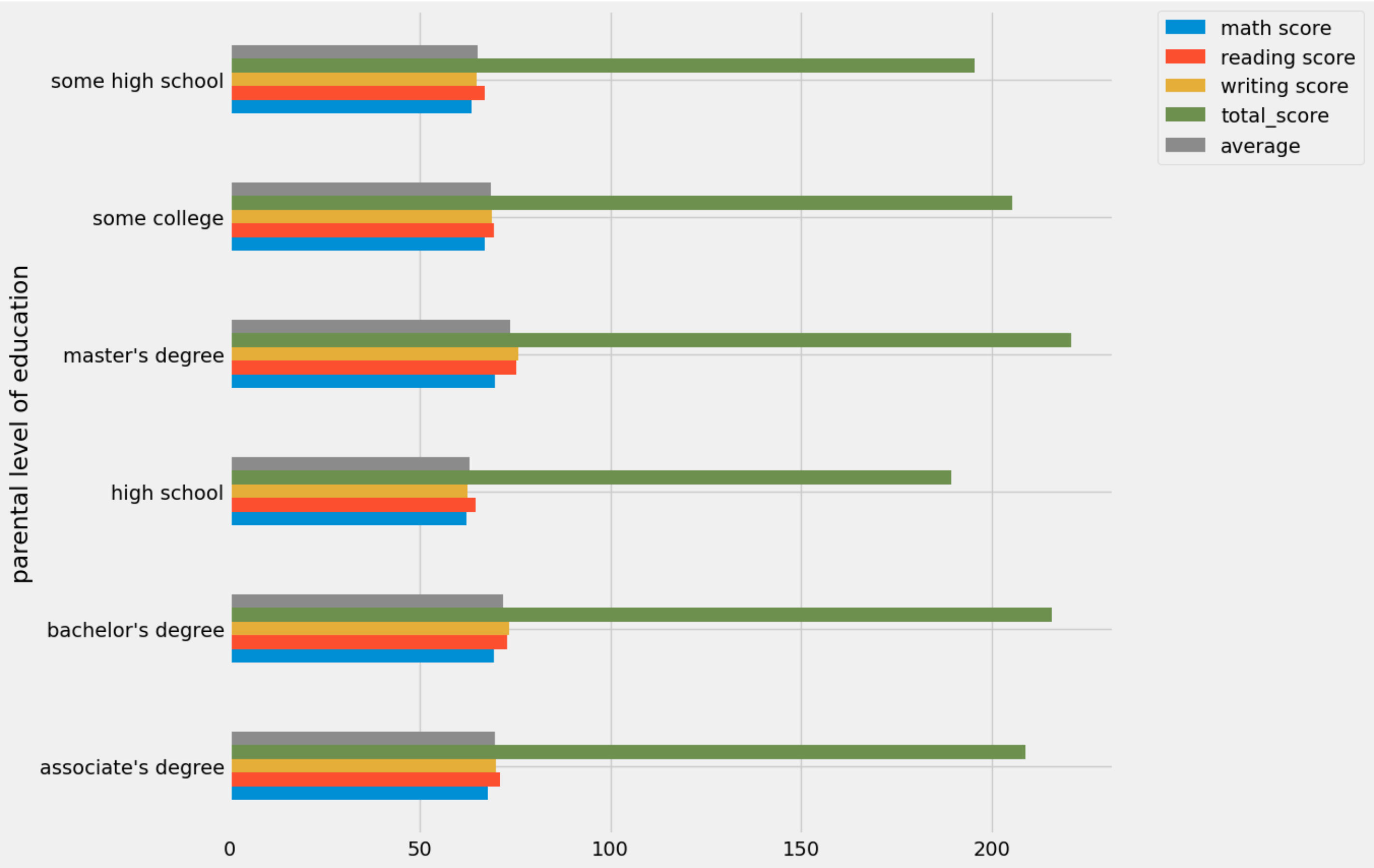
```
plt.rcParams['figure.figsize'] = (15, 9)
plt.style.use('fivethirtyeight')
sns.countplot(x=df['parental level of education'],data=df, palette = 'Blues')
plt.title('Comparison of Parental Education', fontweight = 30, fontsize = 20)
plt.xlabel('Degree')
plt.ylabel('count')
plt.show()
```



Largest number of student's parents level of education os from some college

In [38]:

```
#bivariate analysis
df.groupby('parental level of education').agg('mean').plot(kind='barh',figsize=(10,10))
plt.legend(bbox_to_anchor=(1.05, 1), loc=2, borderaxespad=0.)
plt.show()
```

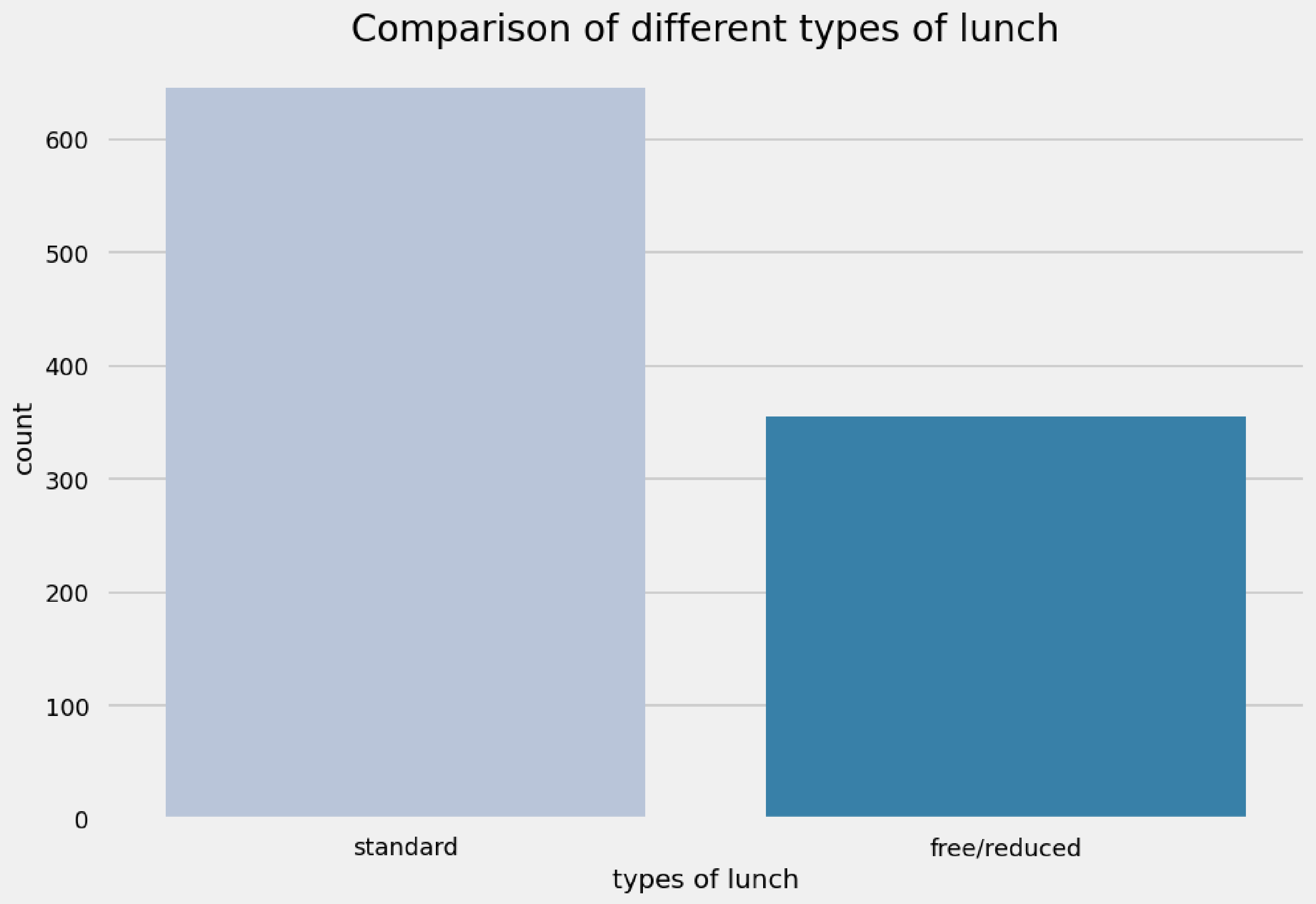


Total scores of students is higher whose parents are having bachelores or masters degree

Lunch - Bivariate and multivariate analysis

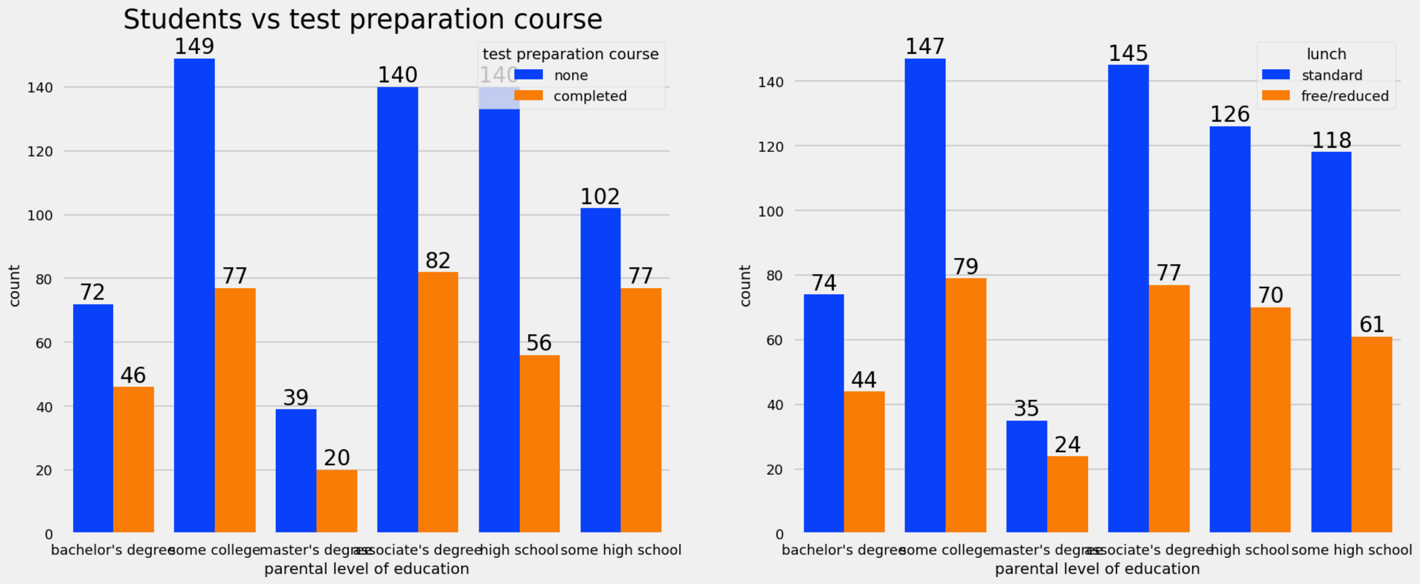
In [39]:

```
plt.rcParams['figure.figsize'] = (15, 9)
plt.style.use('seaborn-talk')
sns.countplot(x=df['lunch'], data=df,palette = 'PuBu')
plt.title('Comparison of different types of lunch', fontweight = 30, fontsize = 20)
plt.xlabel('types of lunch')
plt.ylabel('count')
plt.show()
```



In [40]:

```
#bivariate analysis

f,ax=plt.subplots(1,2,figsize=(20,8))
sns.countplot(x=df['parental level of education'],data=df,palette = 'bright',hue='test pre
ax[0].set_title('Students vs test preparation course ',color='black',size=25)
for container in ax[0].containers:
    ax[0].bar_label(container,color='black',size=20)

sns.countplot(x=df['parental level of education'],data=df,palette = 'bright',hue='lunch',s
for container in ax[1].containers:
    ax[1].bar_label(container,color='black',size=20)
```



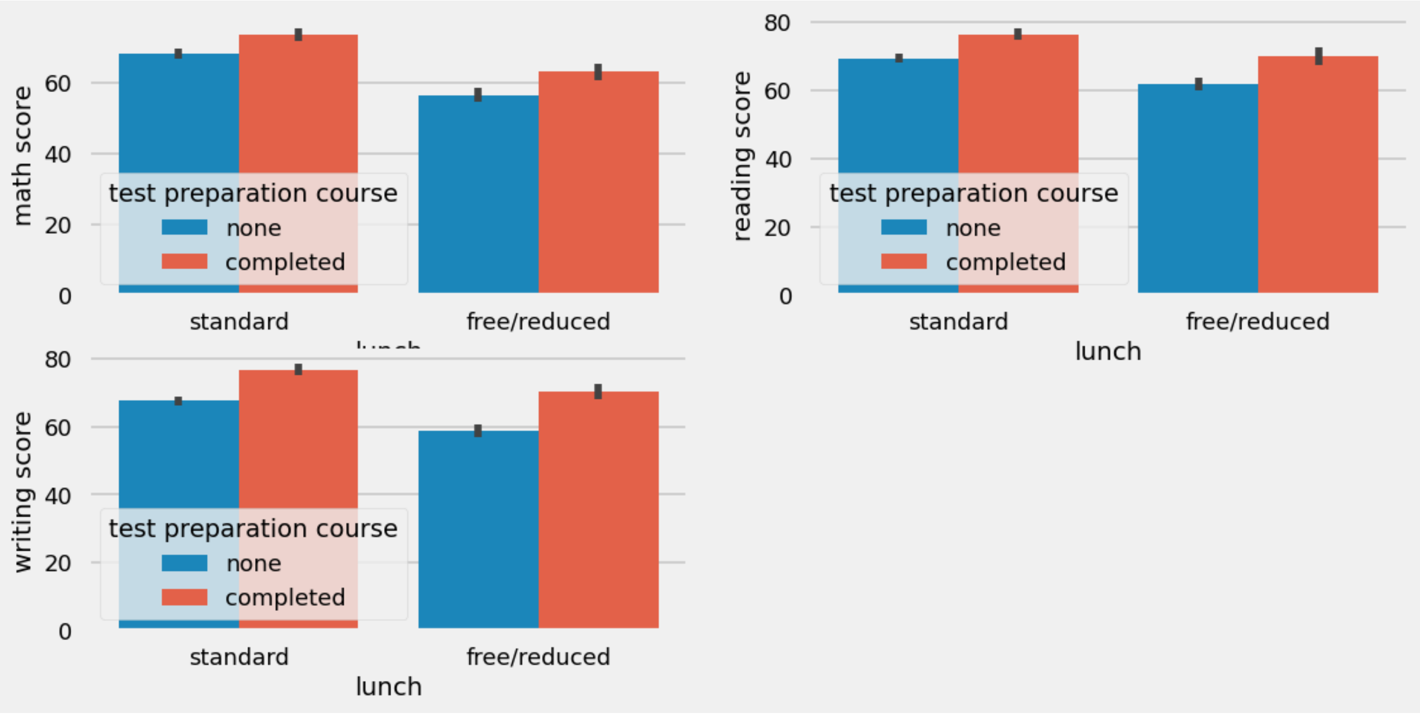
Is test preparation has any impact on student performance

In [41]:

```
plt.figure(figsize=(12,6))
plt.subplot(2,2,1)
sns.barplot (x=df['lunch'], y=df['math score'], hue=df['test preparation course'])
plt.subplot(2,2,2)
sns.barplot (x=df['lunch'], y=df['reading score'], hue=df['test preparation course'])
plt.subplot(2,2,3)
sns.barplot (x=df['lunch'], y=df['writing score'], hue=df['test preparation course'])
```

Out[41]:

```
<Axes: xlabel='lunch', ylabel='writing score'>
```

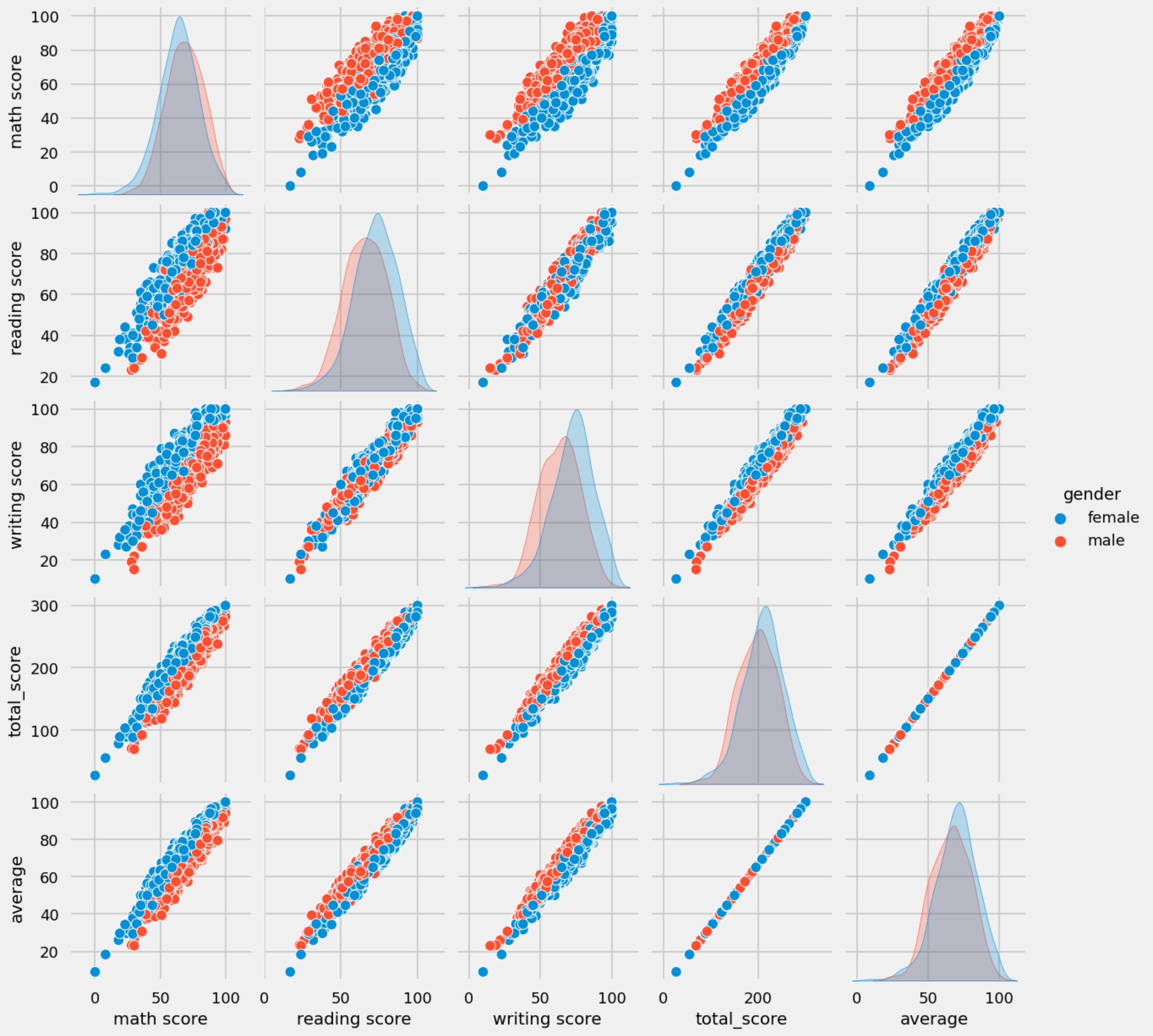


Standard lunch has an positive impact on student performance

Multivariate analysis - pairplot

In [43]:

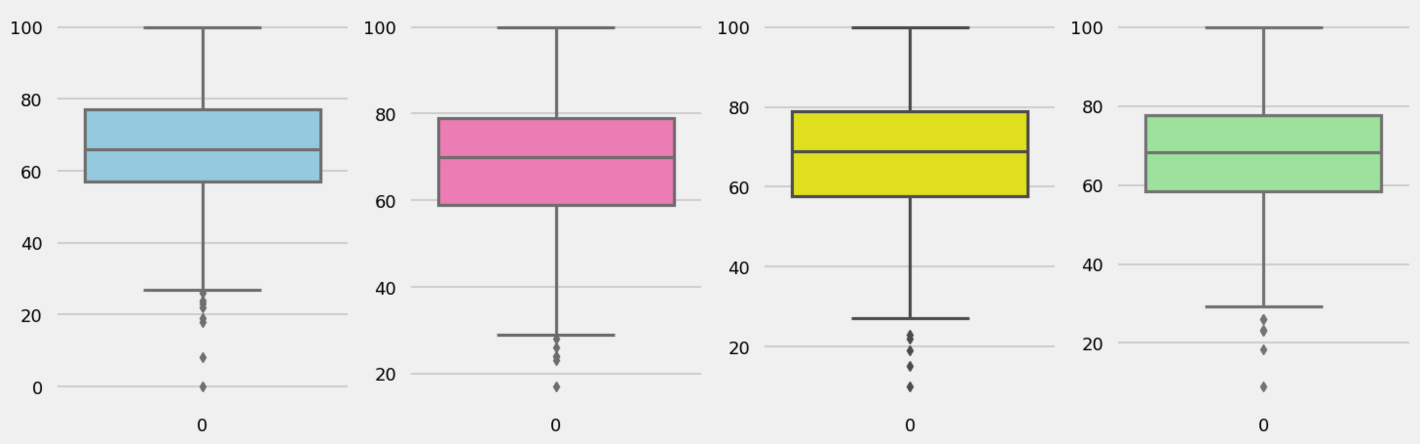
```
sns.pairplot(df,hue = 'gender')
plt.show()
```



We can see a linear trend in the data, it can tell us how we can build a model wround this data.

Checking for outlier

```
In [42]:
plt.subplots(1,4,figsize=(16,5))
plt.subplot(141)
sns.boxplot(df['math score'],color='skyblue')
plt.subplot(142)
sns.boxplot(df['reading score'],color='hotpink')
plt.subplot(143)
sns.boxplot(df['writing score'],color='yellow')
plt.subplot(144)
sns.boxplot(df['average'],color='lightgreen')
plt.show()
```



Conclusion:

- Student's performance is related with lunch, race, parental education
- Females candidates are good performer

In [1]:

```
pip install -U notebook-as-pdf
```

```
Collecting notebook-as-pdf
  Using cached notebook_as_pdf-0.5.0-py3-none-any.whl (6.5 kB)
Collecting PyPDF2
  Using cached pypdf2-3.0.1-py3-none-any.whl (232 kB)
Requirement already satisfied: nbconvert in c:\ana\anaconda3\lib\site-packages (from noteb
ook-as-pdf) (6.1.0)
Collecting pyppeteer
  Using cached pyppeteer-1.0.2-py3-none-any.whl (83 kB)
Requirement already satisfied: traitlets>=5.0 in c:\ana\anaconda3\lib\site-packages (from
nbconvert->notebook-as-pdf) (5.1.0)
Requirement already satisfied: jupyter-core in c:\ana\anaconda3\lib\site-packages (from nb
convert->notebook-as-pdf) (4.8.1)
Requirement already satisfied: jinja2>=2.4 in c:\ana\anaconda3\lib\site-packages (from nbc
onvert->notebook-as-pdf) (2.11.3)
Requirement already satisfied: nbformat>=4.4 in c:\ana\anaconda3\lib\site-packages (from n
bconvert->notebook-as-pdf) (5.1.3)
Requirement already satisfied: bleach in c:\ana\anaconda3\lib\site-packages (from nbconver
t->notebook-as-pdf) (4.0.0)
Requirement already satisfied: pandocfilters>=1.4.1 in c:\ana\anaconda3\lib\site-packages
(from nbconvert->notebook-as-pdf) (1.4.3)
Requirement already satisfied: jupyterlab-pygments in c:\ana\anaconda3\lib\site-packages
(from nbconvert->notebook-as-pdf) (0.1.2)
Requirement already satisfied: testpath in c:\ana\anaconda3\lib\site-packages (from nbconv
ert->notebook-as-pdf) (0.5.0)
Requirement already satisfied: defusedxml in c:\ana\anaconda3\lib\site-packages (from nbco
nvert->notebook-as-pdf) (0.7.1)
Requirement already satisfied: pygments>=2.4.1 in c:\ana\anaconda3\lib\site-packages (from
nbconvert->notebook-as-pdf) (2.10.0)
Requirement already satisfied: entrypoints>=0.2.2 in c:\ana\anaconda3\lib\site-packages (f
rom nbconvert->notebook-as-pdf) (0.3)
Requirement already satisfied: mistune<2,>=0.8.1 in c:\ana\anaconda3\lib\site-packages (fr
om nbconvert->notebook-as-pdf) (0.8.4)
Requirement already satisfied: nbclient<0.6.0,>=0.5.0 in c:\ana\anaconda3\lib\site-package
s (from nbconvert->notebook-as-pdf) (0.5.3)
Requirement already satisfied: typing_extensions>=3.10.0.0 in c:\ana\anaconda3\lib\site-pa
ckages (from PyPDF2->notebook-as-pdf) (3.10.0.2)
Requirement already satisfied: certifi>=2021 in c:\ana\anaconda3\lib\site-packages (from p
yppeteer->notebook-as-pdf) (2021.10.8)
Requirement already satisfied: urllib3<2.0.0,>=1.25.8 in c:\ana\anaconda3\lib\site-package
s (from pyppeteer->notebook-as-pdf) (1.26.7)
Collecting websockets<11.0,>=10.0
```

```
  Downloading websockets-10.4-cp39-cp39-win_amd64.whl (101 kB)
     -------------------------------------- 101.4/101.4 kB 6.1 MB/s eta 0:00:00
Collecting pyee<9.0.0,>=8.1.0
  Using cached pyee-8.2.2-py2.py3-none-any.whl (12 kB)
Requirement already satisfied: tqdm<5.0.0,>=4.42.1 in c:\ana\anaconda3\lib\site-packages
(from pyppeteer->notebook-as-pdf) (4.62.3)
Requirement already satisfied: appdirs<2.0.0,>=1.4.3 in c:\ana\anaconda3\lib\site-packages
(from pyppeteer->notebook-as-pdf) (1.4.4)
Requirement already satisfied: importlib-metadata>=1.4 in c:\ana\anaconda3\lib\site-packag
es (from pyppeteer->notebook-as-pdf) (4.8.1)
Requirement already satisfied: zipp>=0.5 in c:\ana\anaconda3\lib\site-packages (from impor
tlib-metadata>=1.4->pyppeteer->notebook-as-pdf) (3.6.0)
Requirement already satisfied: MarkupSafe>=0.23 in c:\ana\anaconda3\lib\site-packages (fro
m jinja2>=2.4->nbconvert->notebook-as-pdf) (1.1.1)
Requirement already satisfied: jupyter-client>=6.1.5 in c:\ana\anaconda3\lib\site-packages
(from nbclient<0.6.0,>=0.5.0->nbconvert->notebook-as-pdf) (6.1.12)
Requirement already satisfied: nest-asyncio in c:\ana\anaconda3\lib\site-packages (from nb
client<0.6.0,>=0.5.0->nbconvert->notebook-as-pdf) (1.5.1)
Requirement already satisfied: async-generator in c:\ana\anaconda3\lib\site-packages (from
nbclient<0.6.0,>=0.5.0->nbconvert->notebook-as-pdf) (1.10)
Requirement already satisfied: jsonschema!=2.5.0,>=2.4 in c:\ana\anaconda3\lib\site-packag
es (from nbformat>=4.4->nbconvert->notebook-as-pdf) (3.2.0)
Requirement already satisfied: ipython-genutils in c:\ana\anaconda3\lib\site-packages (fro
m nbformat>=4.4->nbconvert->notebook-as-pdf) (0.2.0)
Requirement already satisfied: colorama in c:\ana\anaconda3\lib\site-packages (from tqdm<
5.0.0,>=4.42.1->pyppeteer->notebook-as-pdf) (0.4.4)
Requirement already satisfied: six>=1.9.0 in c:\ana\anaconda3\lib\site-packages (from blea
ch->nbconvert->notebook-as-pdf) (1.16.0)
Requirement already satisfied: packaging in c:\ana\anaconda3\lib\site-packages (from bleac
h->nbconvert->notebook-as-pdf) (21.0)
Requirement already satisfied: webencodings in c:\ana\anaconda3\lib\site-packages (from bl
each->nbconvert->notebook-as-pdf) (0.5.1)
Requirement already satisfied: pywin32>=1.0 in c:\ana\anaconda3\lib\site-packages (from ju
pyter-core->nbconvert->notebook-as-pdf) (228)
Requirement already satisfied: attrs>=17.4.0 in c:\ana\anaconda3\lib\site-packages (from j
sonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert->notebook-as-pdf) (21.2.0)
Requirement already satisfied: pyrsistent>=0.14.0 in c:\ana\anaconda3\lib\site-packages (f
rom jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert->notebook-as-pdf) (0.18.0)
Requirement already satisfied: setuptools in c:\ana\anaconda3\lib\site-packages (from json
schema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert->notebook-as-pdf) (58.0.4)
Requirement already satisfied: python-dateutil>=2.1 in c:\ana\anaconda3\lib\site-packages
(from jupyter-client>=6.1.5->nbclient<0.6.0,>=0.5.0->nbconvert->notebook-as-pdf) (2.8.2)
Requirement already satisfied: tornado>=4.1 in c:\ana\anaconda3\lib\site-packages (from ju
pyter-client>=6.1.5->nbclient<0.6.0,>=0.5.0->nbconvert->notebook-as-pdf) (6.1)
Requirement already satisfied: pyzmq>=13 in c:\ana\anaconda3\lib\site-packages (from jupyt
er-client>=6.1.5->nbclient<0.6.0,>=0.5.0->nbconvert->notebook-as-pdf) (22.2.1)
Requirement already satisfied: pyparsing>=2.0.2 in c:\ana\anaconda3\lib\site-packages (fro
m packaging->bleach->nbconvert->notebook-as-pdf) (3.0.4)
Installing collected packages: pyee, websockets, PyPDF2, pyppeteer, notebook-as-pdf
Successfully installed PyPDF2-3.0.1 notebook-as-pdf-0.5.0 pyee-8.2.2 pyppeteer-1.0.2 webso
ckets-10.4
Note: you may need to restart the kernel to use updated packages.
```

In [3]:

```
pip install pyppeteer
```

```
Requirement already satisfied: pyppeteer in c:\ana\anaconda3\lib\site-packages (1.0.2)
Requirement already satisfied: tqdm<5.0.0,>=4.42.1 in c:\ana\anaconda3\lib\site-packages
(from pyppeteer) (4.62.3)
Requirement already satisfied: appdirs<2.0.0,>=1.4.3 in c:\ana\anaconda3\lib\site-packages
(from pyppeteer) (1.4.4)
Requirement already satisfied: pyee<9.0.0,>=8.1.0 in c:\ana\anaconda3\lib\site-packages (f
rom pyppeteer) (8.2.2)
Requirement already satisfied: importlib-metadata>=1.4 in c:\ana\anaconda3\lib\site-packag
es (from pyppeteer) (4.8.1)
Requirement already satisfied: websockets<11.0,>=10.0 in c:\ana\anaconda3\lib\site-package
```

```
s (from pyppeteer) (10.4)
Requirement already satisfied: urllib3<2.0.0,>=1.25.8 in c:\ana\anaconda3\lib\site-package
s (from pyppeteer) (1.26.7)
Requirement already satisfied: certifi>=2021 in c:\ana\anaconda3\lib\site-packages (from p
yppeteer) (2021.10.8)
Requirement already satisfied: zipp>=0.5 in c:\ana\anaconda3\lib\site-packages (from impor
tlib-metadata>=1.4->pyppeteer) (3.6.0)
Requirement already satisfied: colorama in c:\ana\anaconda3\lib\site-packages (from tqdm<
5.0.0,>=4.42.1->pyppeteer) (0.4.4)
Note: you may need to restart the kernel to use updated packages.
```

In [ ]: