Requirement :

We will analyze the how many students are having good performance and how many are having bad performance.
We will find number of students who are fail and number of students who are pass

Data Source: https://www.kaggle.com/spscientist/students-performance-in-exams

In [67]:

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

In [68]:

```
data = pd.read_csv('StudentsPerformance.csv')
data.head()
```

Out[68]:

	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 [69]:

```
data['gender'].value_counts()
```

Out[69]:

```
female    518
male      482
Name: gender, dtype: int64
```

Data Cleaning

In [70]:

```
print("Is there any null value in the dataset:",data.isnull().values.any())
```

```
Is there any null value in the dataset: False
```

let's check any missing value

In [71]:

```
print("We need to check null details:",data.isnull().sum())
```

```
We need to check null details: 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
```

Size of data Frame

In [72]:

```
print(data.shape)
```

```
(1000, 8)
```

let's understand the basic information of data frame

In [73]:

```
data.describe()
```

Out[73]:

	math score	reading score	writing score
count	1000.00000	1000.000000	1000.000000
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

let's take the min and max marks for math_score,reading_score and writing_score

In [74]:

```
data['math score'].min()
```

Out[74]:

```
0
```

In [75]:

```
data['math score'].max()
```

Out[75]:

```
100
```

In [76]:

```
data['reading score'].min()
```

Out[76]:

```
17
```

In [77]:

```
data['reading score'].max()
```

Out[77]:

100

In [78]:

```
data['writing score'].min()
```

Out[78]:

10

In [79]:

```
data['writing score'].max()
```

Out[79]:

100

let's take passing marks 35

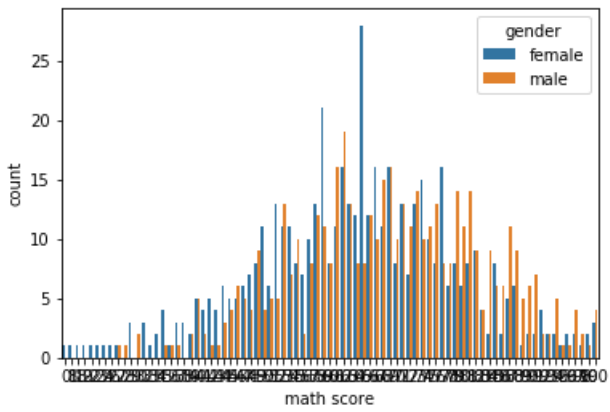
In [80]:

```
pass_marks = 35
```

Let's understand bar chart between math score and students

In [81]:

```
import seaborn as sns
p = sns.countplot(x="math score", hue = "gender", data=data)
```



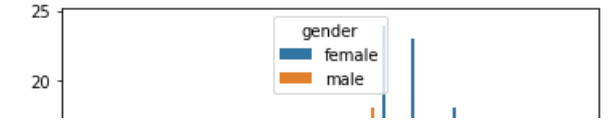
Observation:

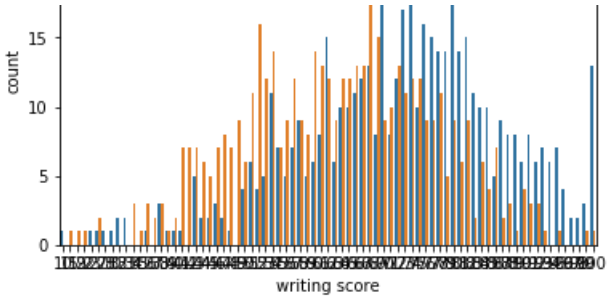
There is x-axis shows math score and y axis shows the count from 0 to 25

Let's understand bar chart between writing score and students

In [82]:

```
import seaborn as sns
p = sns.countplot(x="writing score", hue = "gender", data=data)
```

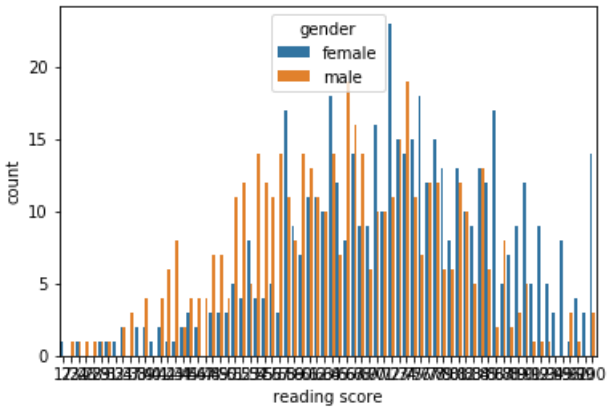




Let's understand bar chart between reading score and students

In [83]:

```
import seaborn as sns
p = sns.countplot(x="reading score", hue = "gender", data=data)
```



How many students passed in Math Exam

In [84]:

```
data['MathPassStatus'] = np.where(data['math score']<pass_marks,'Fail','Pass')
data['MathPassStatus'].value_counts()
```

Out[84]:

```
Pass    978
Fail     22
Name: MathPassStatus, dtype: int64
```

We found total passed students : 978 and failed : 22

How many students passed in Writing Exam

In [85]:

```
data['WritingPassStatus'] = np.where(data['writing score']<pass_marks,'Fail','Pass')
data['WritingPassStatus'].value_counts()
```

Out[85]:

```
Pass    983
Fail     17
Name: WritingPassStatus, dtype: int64
```

We found total Passed students : 983 and failed :17

How many students passed in Reading

In [86]:

```
data['ReadingPassStatus'] = np.where(data['reading score']<pass_marks,'Fail','Pass')
data['ReadingPassStatus'].value_counts()
```

Out[86]:

```
Pass    985
Fail     15
Name: ReadingPassStatus, dtype: int64
```

We found total Passed students : 985 and failed : 15

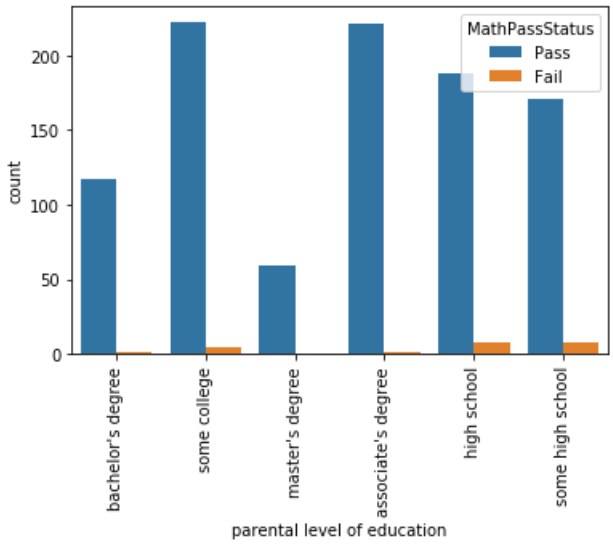
Let's understand number of passed and failed students based on parental level of education in Math Exam

In [87]:

```
p=sns.countplot(x="parental level of education",hue = 'MathPassStatus',data = data)
plt.setp(p.get_xticklabels(), rotation=90)
```

Out[87]:

```
[None, None, None, None, None, None, None, None, None, None, None, None]
```

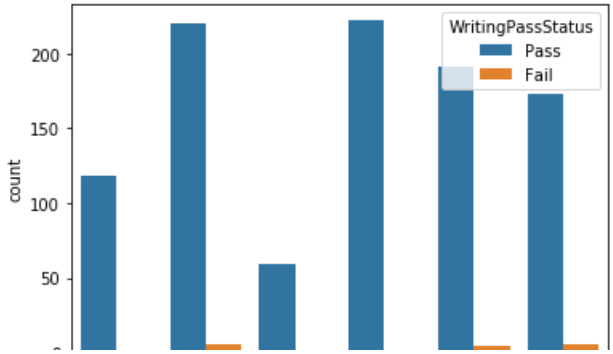


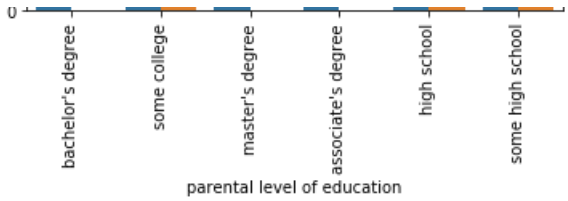
Highest pass students belong to some college as parental level of education

Let's understand number of passed and failed students based on parental level of education in Writing Exam

In [88]:

```
p=sns.countplot(x="parental level of education",hue = 'WritingPassStatus',data = data)
_= plt.setp(p.get_xticklabels(), rotation=90)
```



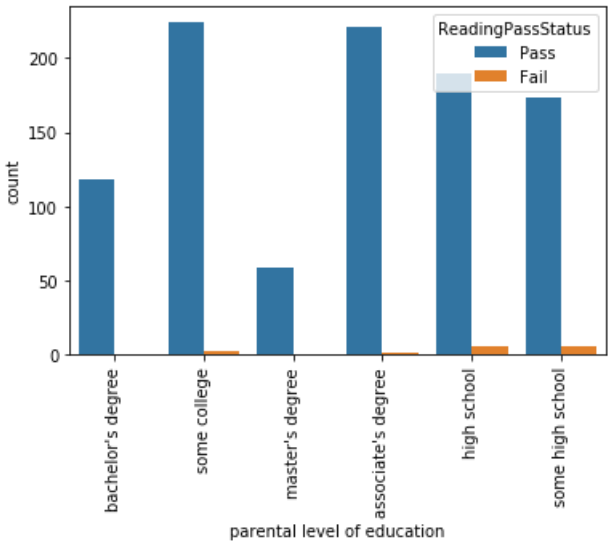


Highest Passed students in writing exam belong to associate's degree

Let's understand number of passed and failed students based on parental level of education in Reading

In [89]:

```
p=sns.countplot(x="parental level of education",hue = 'ReadingPassStatus',data = data)
_= plt.setp(p.get_xticklabels(), rotation=90)
```



let check how many students are passed in all subjects

In [90]:

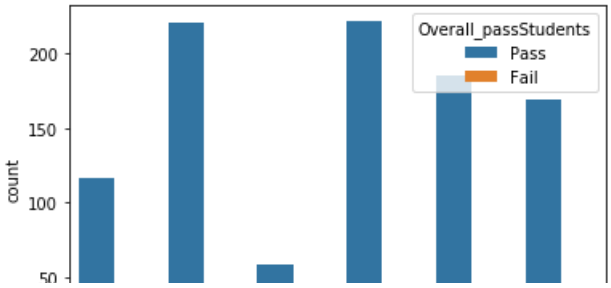
```
data['Overall_passStudents'] = data.apply(lambda x : 'Fail' if x['MathPassStatus'] == 'Fail' or x['
WritingPassStatus'] == 'Fail'
                                          or x['ReadingPassStatus'] == 'Fail' else 'Pass',axis = 1)
data['Overall_passStudents'].value_counts()
```

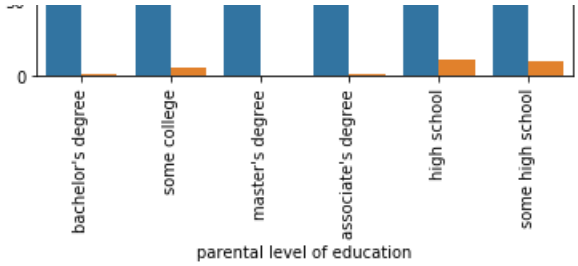
Out[90]:

```
Pass    971
Fail     29
Name: Overall_passStudents, dtype: int64
```

In [91]:

```
p = sns.countplot(x='parental level of education',hue = 'Overall_passStudents',data= data)
_ = plt.setp(p.get_xticklabels(),rotation=90)
```





Find the percentage of Marks

In [92]:

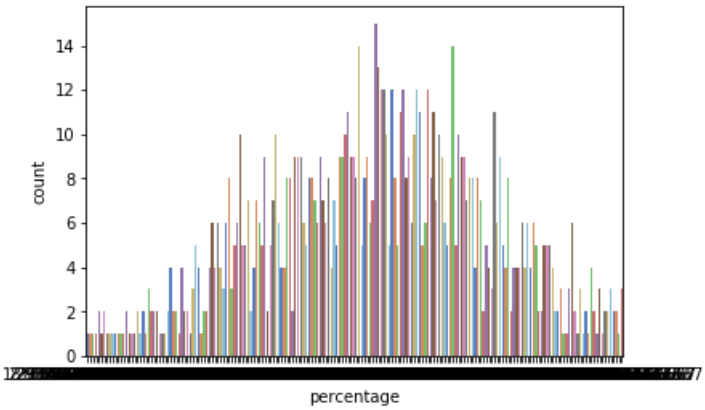
```
data['total_marks'] = data['math score']+data['writing score']+data['reading score']
data['percentage'] = data['total_marks']/3
data.head()
```

Out[92]:

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

In [93]:

```
p = sns.countplot(x='percentage',data=data,palette = "muted")
_ = plt.setp(p.get_xticklabels(),rotation=0)
```



Let assign the grades

above 75 = A Grade

65 to 75 = B Grade

55 to 65 = C Grade

45 to 55 = D Grade

35 to 45 = E Grade

below 35 = Fail Grade

In [95]:

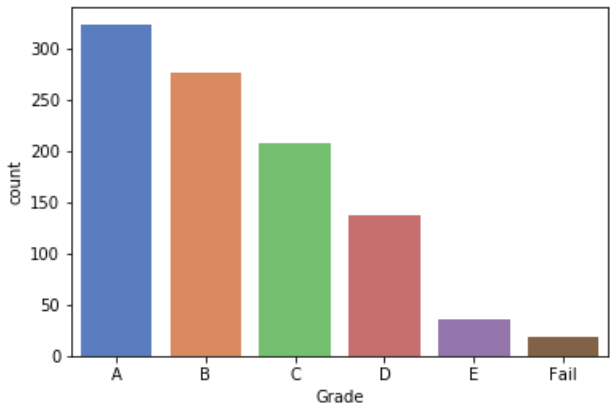
```
def GetGrade(percentage,Overall_passStudents):
    if (Overall_passStudents == 'F'):
        return 'F'
    if (percentage>=75):
        return 'A'
    if (percentage>=65):
        return 'B'
    if (percentage>=55):
        return 'C'
    if (percentage>=45):
        return 'D'
    if (percentage>=35):
        return 'E'
    else:
        return 'Fail'
data['Grade'] = data.apply(lambda x : GetGrade(x['percentage'], x['Overall_passStudents']), axis=1)

data.Grade.value_counts()
```

Out[95]:

```
A       324
B       277
C       208
D       137
E        36
Fail     18
Name: Grade, dtype: int64
```

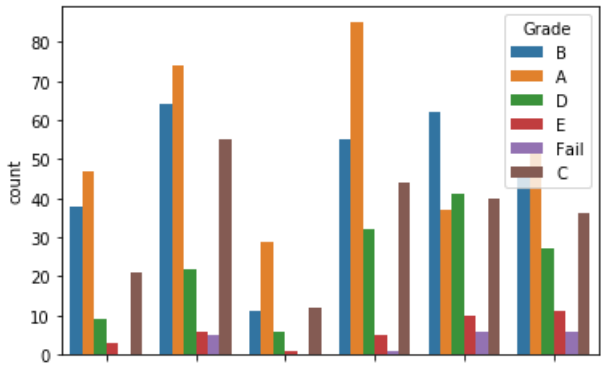
In [97]:

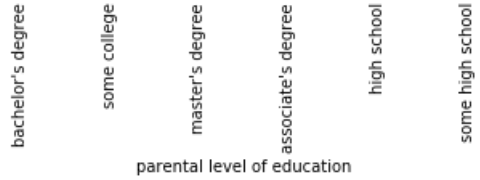
```
p = sns.countplot(x= 'Grade',data=data,order = ['A','B','C','D','E','Fail'],palette = "muted")
plt.show()
```



In [98]:

```
p = sns.countplot(x= 'parental level of education',hue = 'Grade',data=data)
_ = plt.setp(p.get_xticklabels(),rotation=90)
```




bachelor's degree
some college
master's degree
associate's degree
high school
some high school
parental level of education

In [ ]: