In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
%matplotlib inline
```

In [24]:
```
df = pd.read_csv('cars.csv')
```

In [25]:
```
df.head()
```

Out[25]:

	passedemissions	mpg	displacement	horsepower	cylinders	weight	acceleration	modelyear	carname
0	False	18.0	307.0	130.0	8.0	1.7520	12.0	70.0	chevrolet chevelle malibu
1	False	15.0	350.0	165.0	8.0	1.8465	11.5	70.0	buick skylark 320
2	False	18.0	318.0	150.0	8.0	1.7180	11.0	70.0	plymouth satellite
3	False	16.0	304.0	150.0	8.0	1.7165	12.0	70.0	amc rebel sst
4	False	17.0	302.0	140.0	8.0	1.7245	10.5	70.0	ford torino

In [26]:
```
df.dropna(inplace=True)
```

In [27]:
```
df.drop(['passedemissions','carname','cylinders','acceleration','modelyear'],axis=1,inplace=True)
```

In [28]:
```
#creating a function to replace all numeric values in mpg column as high, low or medium fuel efficie
ncy
def change_mpg_to_effi(cols):
    a=cols[0]
    if a<=17:
        return 'low'
    elif (a>17 and a<=29):
        return 'medium'
    else:
        return 'high'
```

In [29]:
```
#applying the above function on that column
df['mpg']=df[['mpg','displacement']].apply(change_mpg_to_effi,axis=1)
```

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

Out[30]:

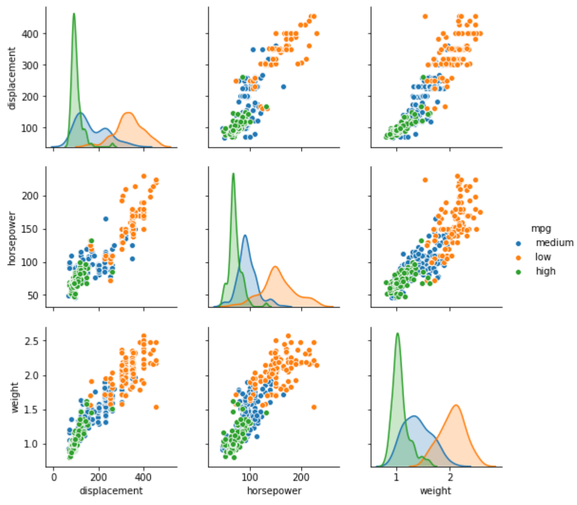
	mpg	displacement	horsepower	weight
0	medium	307.0	130.0	1.7520
1	low	350.0	165.0	1.8465
2	medium	318.0	150.0	1.7180
3	low	304.0	150.0	1.7165
4	low	302.0	140.0	1.7245

In [31]:
```
df['mpg'].value_counts()
```

Out[31]:
```
medium    198
low        99
high       95
Name: mpg, dtype: int64
```

In [32]:
```
#visulaizing the dataframe
sns.pairplot(df,hue='mpg')
```

Out[32]:
```
<seaborn.axisgrid.PairGrid at 0x26ab7d35780>
```



In [33]:
```
from sklearn.model_selection import train_test_split
```

In [34]:
```
#splitting our data into test and training
X=df.drop('mpg',axis=1)
y=df['mpg']
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=101)
```

In [35]:
```
#importing support vector machine model from scikit learn
from sklearn.svm import SVC
```

In [36]:
```
svc_model = SVC()
```

In [38]:
```
#fitting our model on training data
svc_model.fit(X_train,y_train)
```

```
C:\Users\Chandan\Anaconda3\lib\site-packages\sklearn\svm\base.py:196: FutureWarning: The default
value of gamma will change from 'auto' to 'scale' in version 0.22 to account better for unscaled
features. Set gamma explicitly to 'auto' or 'scale' to avoid this warning.
  "avoid this warning.", FutureWarning)
```

Out[38]:
```
SVC(C=1.0, cache_size=200, class_weight=None, coef0=0.0,
  decision_function_shape='ovr', degree=3, gamma='auto_deprecated',
  kernel='rbf', max_iter=-1, probability=False, random_state=None,
  shrinking=True, tol=0.001, verbose=False)
```

In [39]:
```
#predicting categories for test data
predictions=svc_model.predict(X_test)
```

In [40]:
```
#analyzing our findings
from sklearn.metrics import classification_report, confusion_matrix
```

In [41]:
```
print(confusion_matrix(y_test,predictions))
```

```
[[11  0  9]
 [ 0 18 13]
 [ 4  0 63]]
```

In [42]:
```
print(classification_report(y_test,predictions))
```

```
              precision    recall  f1-score   support

        high       0.73      0.55      0.63        20
         low       1.00      0.58      0.73        31
      medium       0.74      0.94      0.83        67

   micro avg       0.78      0.78      0.78       118
   macro avg       0.82      0.69      0.73       118
weighted avg       0.81      0.78      0.77       118
```

In [ ]:
```
```