Module 04 Applied Machine Learning Assignment 05

June 7, 2022

[1]:
```
import pandas as pd
studentScore = pd.read_csv('student_scores.csv')
```

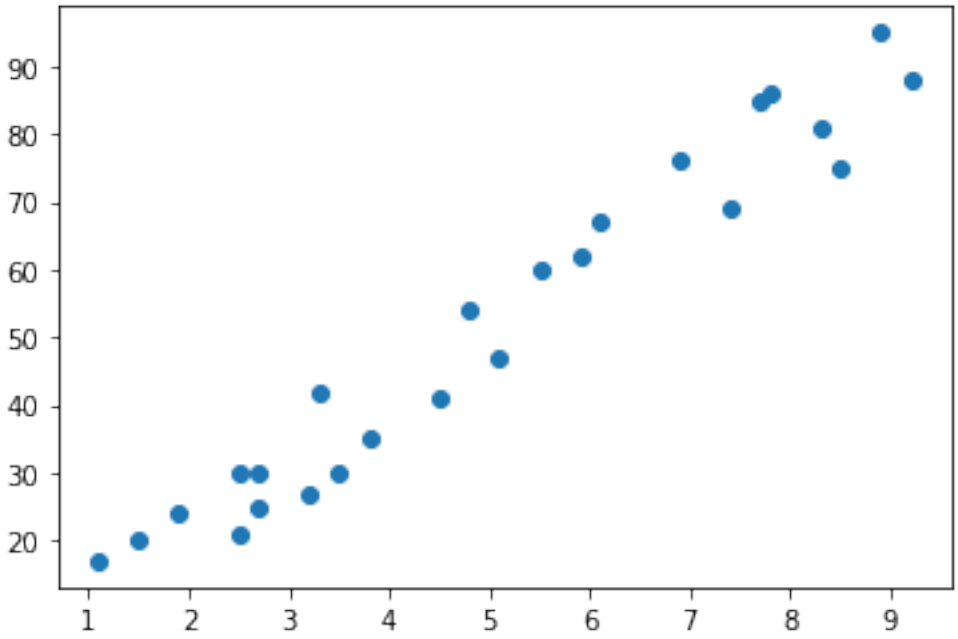
[3]:
```
studentScore.describe()
```

[3]:

	Hours	Scores
count	25.000000	25.000000
mean	5.012000	51.480000
std	2.525094	25.286887
min	1.100000	17.000000
25%	2.700000	30.000000
50%	4.800000	47.000000
75%	7.400000	75.000000
max	9.200000	95.000000

[4]:
```
import matplotlib.pyplot as plt
Hours = studentScore['Hours']
Scores = studentScore['Scores']
plt.scatter(Hours,Scores)
```

[4]:
```
<matplotlib.collections.PathCollection at 0x1bf9e3b2cd0>
```



[10]:
```
studentScore.isna().sum()
studentScore.duplicated().sum()
```

[10]:
```
Hours     0
Scores    0
dtype: int64
```

[10]:
```
0
```

[16]:
```
import sklearn.preprocessing as ps
import numpy as np
Encoder = ps.StandardScaler()
x = Encoder.fit_transform(np.c_[Hours])
y = Encoder.fit_transform(np.c_[Scores])
```

[31]:
```
from sklearn.model_selection import train_test_split

train_x, test_x, train_y, test_y = train_test_split(x, y)
```

[32]:
```
from sklearn.linear_model import LinearRegression
from sklearn.metrics import mean_squared_error
model = LinearRegression()
model.fit(train_x,train_y)
pred_y = model.predict(test_x)
mean_squared_error(pred_y,test_y)
```

[32]:
```
LinearRegression()
```

[32]:
```
0.03678398715850661
```

[47]:
```
petrol = pd.read_csv('petrol_consumption.csv')
petrol.isna().sum()
petrol.duplicated().sum()
```

[47]:
```
Petrol_tax                      0
Average_income                  0
Paved_Highways                  0
Population_Driver_licence(%)    0
Petrol_Consumption              0
dtype: int64
```

[47]:
```
0
```

[48]:
```
petrol.describe()
```

[48]:

	Petrol_tax	Average_income	Paved_Highways	\
count	48.000000	48.000000	48.000000	
mean	7.668333	4241.833333	5565.416667	
std	0.950770	573.623768	3491.507166	
min	5.000000	3063.000000	431.000000	
25%	7.000000	3739.000000	3110.250000	
50%	7.500000	4298.000000	4735.500000	
75%	8.125000	4578.750000	7156.000000	
max	10.000000	5342.000000	17782.000000	

	Population_Driver_licence(%)	Petrol_Consumption
count	48.000000	48.000000
mean	0.570333	576.770833
std	0.055470	111.885816
min	0.451000	344.000000
25%	0.529750	509.500000
50%	0.564500	568.500000
75%	0.595250	632.750000
max	0.724000	968.000000

[71]:
```
from sklearn.compose import make_column_transformer
x = petrol.iloc[:,0:4]
y = petrol.iloc[:,4]
x.head()
```

[71]:

	Petrol_tax	Average_income	Paved_Highways	Population_Driver_licence(%)
0	9.0	3571	1976	0.525
1	9.0	4092	1250	0.572

2	9.0	3865	1586	0.580
3	7.5	4870	2351	0.529
4	8.0	4399	431	0.544

[78]:
```
standardScaler = ps.StandardScaler()
transformer =␣
 ↪make_column_transformer((standardScaler,['Petrol_tax','Average_income','Paved_Highways','Po
processed_x = transformer.fit_transform(x)
processed_y = standardScaler.fit_transform(np.c_[y])
```

[83]:
```
train_x1, test_x1, train_y1, test_y1 = train_test_split(processed_x,␣
 ↪processed_y)
```

[84]:
```
model = LinearRegression()
model.fit(train_x1,train_y1)
pred_y1 = model.predict(test_x1)
mean_squared_error(pred_y1,test_y1)
```

[84]:
```
LinearRegression()
```

[84]:
```
0.4080999315290061
```