

Question_1

September 23, 2020

```
[1]: import matplotlib
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
import sklearn
import sklearn.linear_model
```

```
[2]: col_list = ["X1"]
# Load the data
sales_data = pd.read_csv("mlr05.csv", usecols=col_list)[:20]
print(sales_data)
```

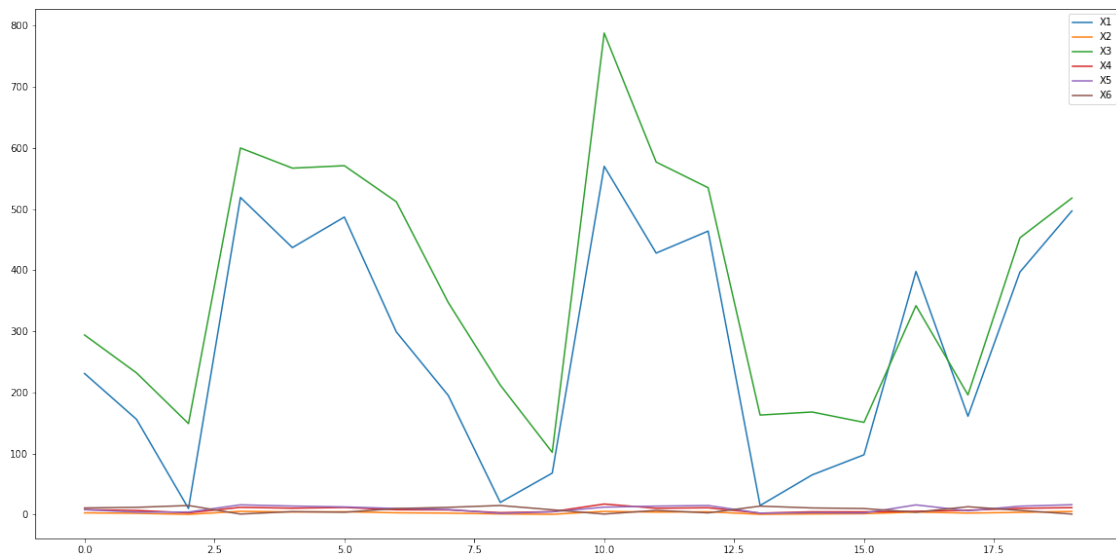
	X1
0	231.0
1	156.0
2	10.0
3	519.0
4	437.0
5	487.0
6	299.0
7	195.0
8	20.0
9	68.0
10	570.0
11	428.0
12	464.0
13	15.0
14	65.0
15	98.0
16	398.0
17	161.0
18	397.0
19	497.0

```
[3]: predictor_col_list = ["X2", "X3", "X4", "X5", "X6"]
#Loading predictors
predictor = pd.read_csv("mlr05.csv", usecols=predictor_col_list)[:20]
print(predictor)
```

	X2	X3	X4	X5	X6
0	3.0	294	8.2	8.200000	11
1	2.2	232	6.9	4.100000	12
2	0.5	149	3.0	4.300000	15
3	5.5	600	12.0	16.100000	1
4	4.4	567	10.6	14.100000	5
5	4.8	571	11.8	12.700000	4
6	3.1	512	8.1	10.100000	10
7	2.5	347	7.7	8.400000	12
8	1.2	212	3.3	2.100000	15
9	0.6	102	4.9	4.700000	8
10	5.4	788	17.4	12.300000	1
11	4.2	577	10.5	14.000000	7
12	4.7	535	11.3	15.000000	3
13	0.6	163	2.5	2.500000	14
14	1.2	168	4.7	3.300000	11
15	1.6	151	4.6	2.700000	10
16	4.3	342	5.5	16.000000	4
17	2.6	196	7.2	6.300000	13
18	3.8	453	10.4	13.900000	7
19	5.3	518	11.5	16.299999	1

```
[4]: # Prepare the data
ax = sales_data.plot(figsize=(20,10))
predictor.plot(ax=ax)
```

```
[4]: <matplotlib.axes._subplots.AxesSubplot at 0x1859df20f88>
```



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[5]: # Select a linear model
lin_reg_model = sklearn.linear_model.LinearRegression()
```

```
[6]: # Train the model
lin_reg_model.fit(predictor,sales_data)
```

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[6]: LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)
```

```
[7]: print('Final predicted X1 ValueS: ')
for i in range(20,27):
    new_predictors = pd.read_csv("mlr05.csv", usecols=predictor_col_list)[i:i+1]
    #X2, X3, X4, X5, X6 values for predicting the new X1 values
    predictor_list = list(new_predictors.loc[i])
    #predicted X1 Values
    print(lin_reg_model.predict([predictor_list]))
```

Final predicted X1 ValueS:

```
[[554.4944811]]
[[71.75780418]]
[[34.23834288]]
[[351.67227227]]
[[342.77345791]]
[[524.83570362]]
[[548.58784667]]
```

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[ ]:
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