SP21-BCS-017_Muhammad_Haroon_Shahzad_Quiz_2

March 28, 2024

0.0.1 Import Necessary Libraries

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

0.0.2 Creating Data Frame of given data

```python
import pandas as pd

data = {
    'House Area in Marla': [5, 6, 7, 5, 10, 8],
    'No. of Rooms': [4, 5, 4, 5, 6, 6],
    'Price in Millions of PKR': [15, 17, 18, 15, 8, 16]
}

df = pd.DataFrame(data)

print(df)
```

```
   House Area in Marla  No. of Rooms  Price in Millions of PKR
0                    5             4                        15
1                    6             5                        17
2                    7             4                        18
3                    5             5                        15
4                   10             6                         8
5                    8             6                        16
```

0.0.3 Apply linear Polynomial and Multiple Regression

```python
from sklearn.linear_model import LinearRegression


y  = df['Price in Millions of PKR']


# Linear Regression
linear_reg = LinearRegression()
```

```
linear_reg.fit(df[['House Area in Marla']], y)
df['Linear Regression'] = linear_reg.predict(df[['House Area in Marla']])


# 2 is the degree of the polynomial

coefficients = np.polyfit(df['House Area in Marla'], y, 2)
poly = np.poly1d(coefficients)
df['Polynomial Regression'] = poly(df['House Area in Marla'])
df

# Multiple Regression
multi_reg = LinearRegression()
multi_reg.fit(df[['House Area in Marla', 'No. of Rooms']], y)
df['Multiple Regression'] = multi_reg.predict(df[['House Area in Marla', 'No.
 ↪of Rooms']])


df
```

```
[ ]:    House Area in Marla  No. of Rooms  Price in Millions of PKR  \
     0                    5             4                        15
     1                    6             5                        17
     2                    7             4                        18
     3                    5             5                        15
     4                   10             6                         8
     5                    8             6                        16

        Linear Regression  Polynomial Regression  Multiple Regression
     0          16.991150              14.979968            17.377119
     1          15.814159              17.213942            15.567797
     2          14.637168              17.629808            15.614407
     3          16.991150              14.979968            16.449153
     4          11.106195               7.968750            11.114407
     5          13.460177              16.227564            12.877119
```