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In [1]: #Ayush Sharma 209303312
# 6.1 Program to demonstrate Linear Regression (single variable) using python
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from sklearn import linear_model
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In [2]: url = (r"https://raw.githubusercontent.com/codebasics/py/master/ML/1_linear_reg/home.csv")
df = pd.read_csv(url)
```

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In [3]: df.shape
```

```
Out[3]: (5, 2)
```

```
In [4]: df.head
```

```
Out[4]: <bound method NDFrame.head of      area    price
0    2600  550000
1    3000  565000
2    3200  610000
3    3600  680000
4    4000  725000>
```

```
In [5]: df
```

```
Out[5]:
```

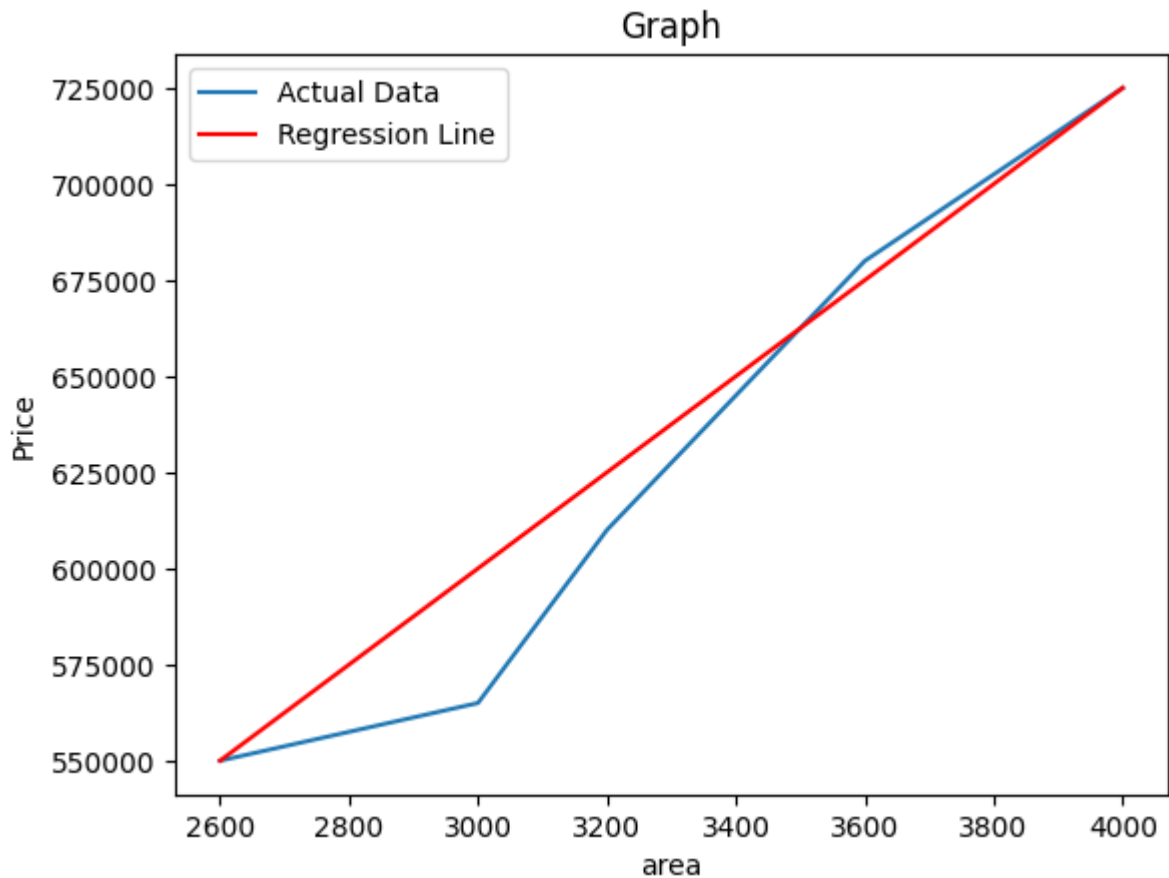
	area	price
0	2600	550000
1	3000	565000
2	3200	610000
3	3600	680000
4	4000	725000

```
In [6]: area = df['area'].to_list()
price = df["price"].to_list()
ar_pr = [area[i]*price[i] for i in range(len(area))]
ar2 = [area[i]*area[i] for i in range(len(area))]
print(area,price,ar_pr,ar2)

[2600, 3000, 3200, 3600, 4000] [550000, 565000, 610000, 680000, 725000] [1430000000
0, 1695000000, 1952000000, 2448000000, 2900000000] [6760000, 9000000, 10240000, 12
960000, 16000000]
```

```
In [7]: plt.plot(area,price)
plt.plot([area[0],area[4]],[price[0],price[4]],color="red")
plt.xlabel("area")
plt.ylabel("Price")
plt.legend(["Actual Data","Regression Line"])
plt.title("Graph")
```

Out[7]: Text(0.5, 1.0, 'Graph')



```
In [8]: area_sum = sum(area)
price_sum = sum(price)
ar_pr_sum = sum(ar_pr)
ar2_sum = sum(ar2)
n = len(area)
print(area_sum, price_sum, ar_pr_sum, ar2_sum, n)
```

```
16400 3130000 1042500000 54960000 5
```

```
In [9]: intercept = (price_sum*ar2_sum-area_sum*ar_pr_sum)/(n*ar2_sum-area_sum*area_sum)
slope = (n*ar_pr_sum-area_sum*price_sum)/(n*ar2_sum-area_sum*area_sum)
print(intercept, slope)
```

```
180616.43835616438 135.7876712328767
```

```
In [10]: def predict(x,c,m):
return m*x + c
```

```
In [11]: val = int(input("Enter the area to predict price: "))
print(f"Price for {val}: ", predict(val, intercept, slope))
print(f"Price for 3300: ", predict(3300, intercept, slope))
```

```
Enter the area to predict price: 5000
Price for 5000: 859554.7945205478
Price for 3300: 628715.7534246575
```