MACHINE LEARNING ASSIGNEMENT

Problem Statement:

Take a toy dataset or any mathematic problem which involves prediction, solve it using any machine learning algorithm of choice and show the actual value via working out the math.

Dataset Preview:

area	price					
2600	550000					
3000	565000					
3200	610000					
3600	595000					
4000	760000					
4100	810000					

This dataset contains 6 rows and 2 columns. We use this dataset to find the relationship between area and price by training with machine learning algorithm -Linear Regression.

Simple linear regression is a statistical technique used for finding the existence of an association relationship between a dependent variable (outcome variable i.e., y) and an independent variable (predictor variable or feature i.e., x). We can only establish that change in the value of the outcome variable (Y) is associated with change in the value of feature (X). When we consider an elementary algebra the equation

for a line is “Y=mx+c” . Here, we are going to calculate linear regression and predict the equation “y=a+bx”.

$$a = \frac{[(\sum y)(\sum x^2) - (\sum x)(\sum xy)]}{[n(\sum x^2) - (\sum x)^2]}$$

$$b = \frac{[n(\sum xy) - (\sum x)(\sum y)]}{[n(\sum x^2) - (\sum x^2)]}$$

Program:

```
# Importing the libraries

import pandas as pd

import matplotlib.pyplot as plt

import numpy as np

#reading the dataset

data=pd.read_csv("C:/Users/tarun/Desktop/price.csv")
```

data.head()

	area	price
0	2600	550000
1	3000	565000
2	3200	610000
3	3600	595000
4	4000	760000

data.tail()

	area	price
1	3000	565000
2	3200	610000
3	3600	595000
4	4000	760000
5	4100	810000

data.shape

```
(6, 2)
```

data.isnull().sum()

area 0

price 0

dtype: int64

```
x=data.iloc[:,:-1].values

y=data.iloc[:,-1].values
```

print(x)

```
[[2600]
 [3000]
 [3200]
 [3600]
 [4000]
 [4100]]
```

print(y)

```
[550000 565000 610000 595000 760000 810000]
```

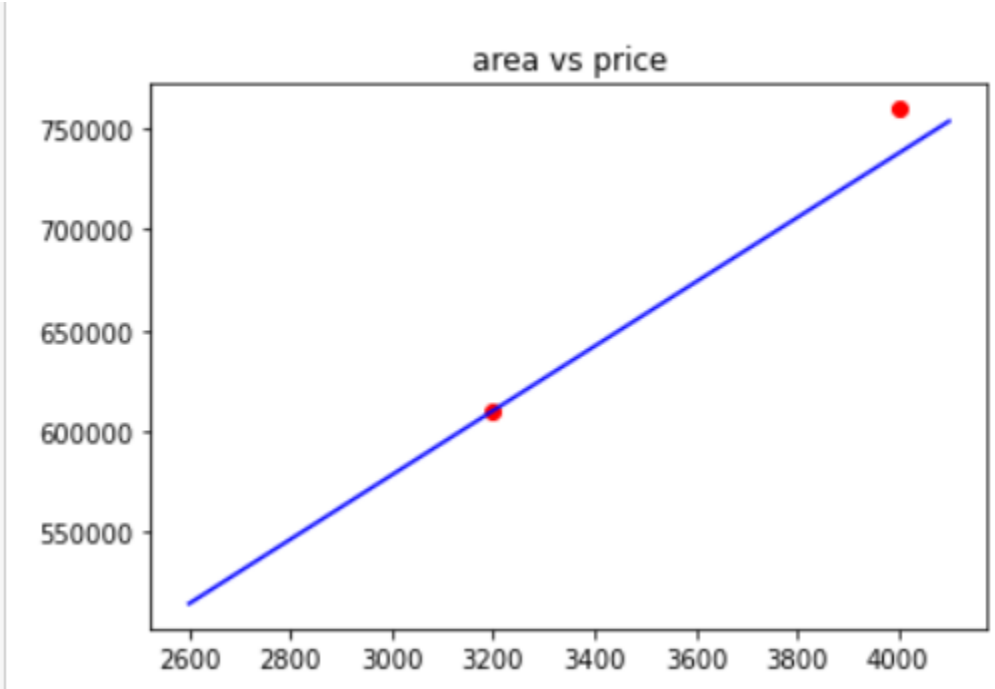
```
from sklearn.model_selection import
train_test_split

x_train,x_test,y_train,y_test=train_test_split(x,y,tes
t_size=0.2)

x_train.shape
```

```
(4, 1)
y_train.shape
(4,)
y_test.shape
(2,)
from sklearn.linear_model import LinearRegression
model=LinearRegression()
model.fit(x_train,y_train)
LinearRegression()
y_pred=model.predict(x_test)
print(y_pred)
[610019.12045889 737896.74952199]
plt.scatter(x_test,y_test,color='red')
plt.plot(x_train,model.predict(x_train),color='blue')
plt.title('area vs price')
plt.xlable("price")
```

plt.ylable("area")



print(model.coef_)

[159.84703633]

print(model.intercept_)

98508.60420650104

y=model.predict([[20]])

print(y)

```
[101705.54493308]
```