Project : Restaurant Revenue Prediction

In this project, you are going to work on the "Restaurant revenue" dataset which contains 100 observations of restaurants with 8 attributes.

Problem Statement:

Create a machine learning model to predict revenue of the restaurant based on the features present in the dataset.

Dataset Attributes:

1. **ID** - Restaurant ID
2. **Name** - Name of the Restaurant
3. **Franchise** - Restaurant has franchise or not
4. **Category** - specific type of category provided by restaurant
5. **No_of_item** - Different types of items provided by restaurant
6. **Order_Placed** - Order placed by customer to restaurant (in lacs)
7. **Revenue** - Total amount of income generated by the restaurant

Tasks To Be Performed:

In this project, you have to predict the restaurant revenue based on the independent features using a machine learning algorithm of your own choice.

Import the libraries

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

Load the dataset

In [2]:
```
df=pd.read_csv("revenue_prediction.csv")
df.head()
```

Out[2]:

	Id	Name	Franchise	Category	City	No_Of_Item	Order_Placed	Revenue
0	101	HungryHowie'sPizza	Yes	Mexican	Bengaluru	55	5.5	5953753
1	102	CharleysPhillySteaks	No	Varied Menu	Gurugram	72	6.8	7223131
2	103	Chuy's	Yes	Chicken	Pune	25	1.9	2555379
3	104	O'Charley's	Yes	Italian/Pizza	Mumbai	18	2.5	2175511
4	105	PolloTropical	Yes	Pizza	Noida	48	4.2	4816715

Examining missing values in a dataset

In [3]:
```
df.isnull().sum()
```

Out[3]:
```
Id              0
Name            0
Franchise       0
Category        0
City            0
No_Of_Item      0
Order_Placed    0
Revenue         0
dtype: int64
```

Drop irrelevant columns ✓

In [4]:
```
df=df.drop(columns=["Id","Name","Franchise","Category","City","No_Of_Item"])
df.head()
```

Out[4]:

	Order_Placed	Revenue
0	5.5	5953753
1	6.8	7223131
2	1.9	2555379
3	2.5	2175511
4	4.2	4816715

In [6]:
```
df.shape
```

Out[6]: (100, 2)

Create independent feature and dependent variable

In [7]:
```
x=df.iloc[:,:-1].values
y=df.iloc[:,-1].values
```

Split the dataset into Training set and Test set

In [8]:
```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.2,random_state=42)
```

In [9]:
```
print(x_train)
```

```
[[ 6.8]
 [ 1.9]
 [ 2.1]
 [ 4.8]
 [ 3.3]
 [ 3.1]
 [ 6.7]
 [ 6.3]
 [ 5.3]
 [ 2.4]
 [ 5. ]
 [ 7.7]
 [ 7.2]
 [ 4.6]
 [ 3.3]
 [ 4.9]
```

In [10]:
```
print(x_test)
```

```
[[5.7]
 [5.4]
 [3.8]
 [3.6]
 [4. ]
 [3.7]
 [3.8]
 [3.5]
 [3.6]
 [5.5]
 [5.2]
 [2.9]
 [3.1]
 [2.2]
 [3.3]
 [4.2]
 [4.3]
 [1.7]
 [1.6]
 [1.9]]
```

In [11]:
```
print(y_train)
```

```
[ 6941173  2025297  2967425  4952255  3452382  3918918  6836483  6412623
  4544227  2525375  3861370  7865428  7495092  7705945  3410878  4517319
  1882131  1756069  3903884 19696939  8630682  4100886  6491607  1270499
  6135276  1521934  4066618  2778621  5286212  5107746  7904084  2175511
  7513524  5461700  5152497  3871344  5966635  2551252  3028267  2364478
  2390534  4567678  4651866  2732645  2156098  4052733  4250758  3836721
  4350573  6694797  6313221  4554237  3004429  7201784  2344689  3258837
 16549064  3261924  3753720  3600467  1619683  4250553  2740687  2447890
  7223131  1763231   849870  2555379  1999068  5906596  2083447  5500818
  3351383  3807496  5025735  3164972  4136425  1099097  6782425  3273041]
```

In [12]:
```
print(y_test)
```

```
[5966193 5595267 3982767 3752885 4264176 3818055 4956086 3727364 3945135
 5953753 4937526 2408199 3347767 2371202 3426169 4816715 4590423 1904842
 2234634 2358644]
```

Training the Simple Linear Regression model on the Training set

In [13]:
```
from sklearn.linear_model import LinearRegression
regressor=LinearRegression()
regressor.fit(x_train,y_train)
```

Out[13]:
```
LinearRegression()
```

Predicting the Test set results ✓

In [14]:
```
y_pred=regressor.predict(x_test)
y_pred
```

Out[14]:
```
array([6351103.23642516, 5984998.65773576, 4032440.90472562,
       3788371.18559936, 4276510.62385189, 3910406.04516249,
       4032440.90472562, 3666336.32603622, 3788371.18559936,
       6107033.5172989 , 5740928.93860949, 2934127.16865742,
       3178196.88778369, 2079883.15171548, 3422266.60690995,
       4520580.34297816, 4642615.20254129, 1469708.85389981,
       1347673.99433668, 1713778.57302608])
```

Visualising the Training set results

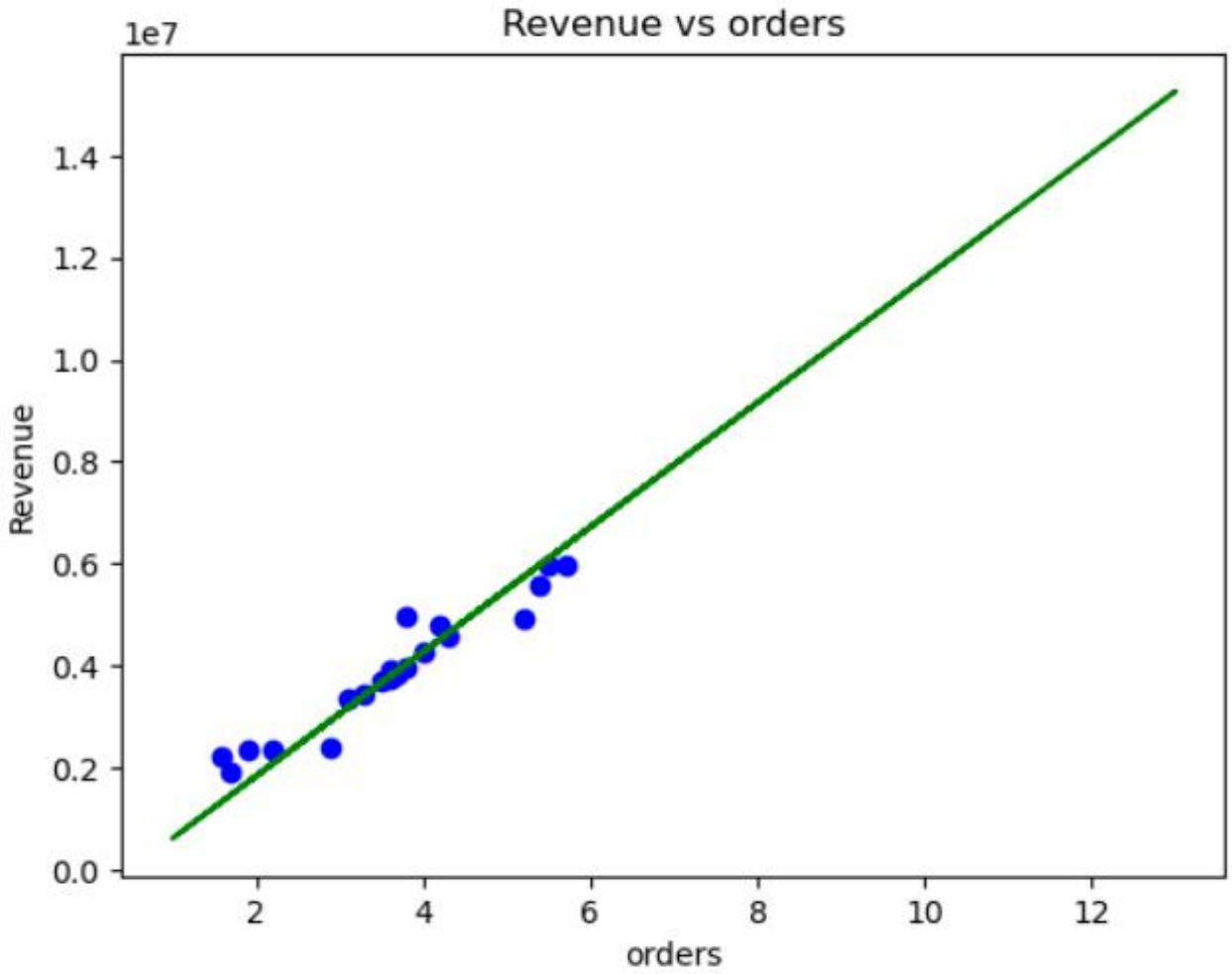
In [15]:
```
plt.scatter(x_train,y_train,color="blue")
plt.plot(x_train,regressor.predict(x_train),color="green")
plt.title("Revenue vs orders")
plt.xlabel("orders")
plt.ylabel("Revenue")
```

Out[15]: Text(0, 0.5, 'Revenue')

Visualising the Test set results

In [16]:
```
plt.scatter(x_test,y_test,color="blue")
plt.plot(x_train,regressor.predict(x_train),color="green")
plt.title("Revenue vs orders")
plt.xlabel("orders")
plt.ylabel("Revenue")
```

Out[16]: Text(0, 0.5, 'Revenue')



Accuracy of the Model ✓

In [17]:
```
from sklearn.metrics import r2_score
score=r2_score(y_pred,y_test)
score
```

Out[17]: 0.9109612329066814 ✓