DAY 2 LAB EXPERIMENTS

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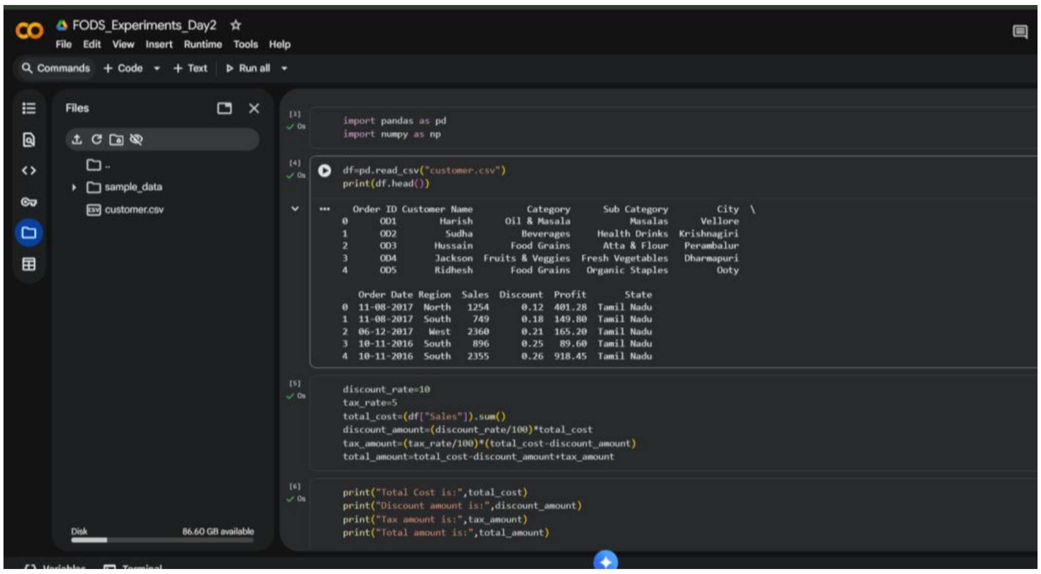
Date : 17/12/2025

EXP_6 To Calculate the total Cost of Customer Purchase including Discount and Taxes



```
import pandas as pd
import numpy as np
```

```
df=pd.read_csv("customer.csv")
print(df.head())
```

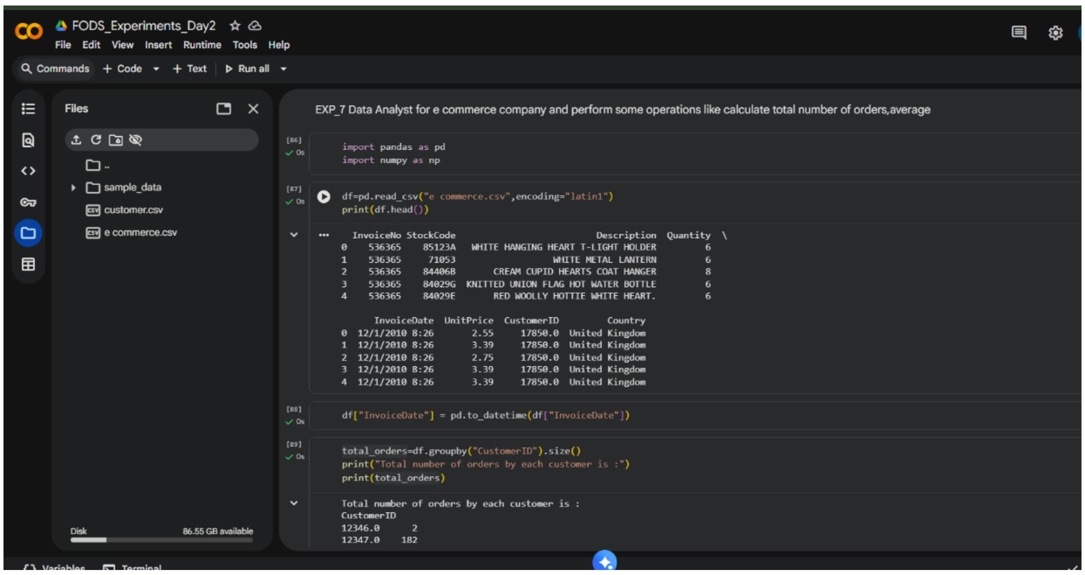
```
  Order ID Customer Name          Category      Sub Category        City  \
0      OD1        Harish      Oil & Masala           Masalas     Vellore
1      OD2         Sudha         Beverages     Health Drinks  Krishnagiri
2      OD3       Hussain       Food Grains      Atta & Flour   Perambalur
3      OD4       Jackson  Fruits & Veggies  Fresh Vegetables   Dharmapuri
4      OD5       Ridhesh       Food Grains   Organic Staples        Ooty

   Order Date Region  Sales  Discount  Profit       State
0  11-08-2017  North   1254      0.12  401.28  Tamil Nadu
1  11-08-2017  South    749      0.18  149.80  Tamil Nadu
2  06-12-2017   West   2360      0.21  165.20  Tamil Nadu
3  10-11-2016  South    896      0.25   89.60  Tamil Nadu
4  10-11-2016  South   2355      0.26  918.45  Tamil Nadu
```

```
discount_rate=10
tax_rate=5
total_cost=(df["Sales"]).sum()
discount_amount=(discount_rate/100)*total_cost
tax_amount=(tax_rate/100)*(total_cost-discount_amount)
total_amount=total_cost-discount_amount+tax_amount
```

```
print("Total Cost is:",total_cost)
print("Discount amount is:",discount_amount)
print("Tax amount is:",tax_amount)
print("Total amount is:",total_amount)
```

EXP_7 Data Analyst for e commerce company and perform some operations like calculate total number of orders, average



EXP_7 Data Analyst for e commerce company and perform some operations like calculate total number of orders,average

```
import pandas as pd
import numpy as np
```

```
df=pd.read_csv("e commerce.csv",encoding="latin1")
print(df.head())
```

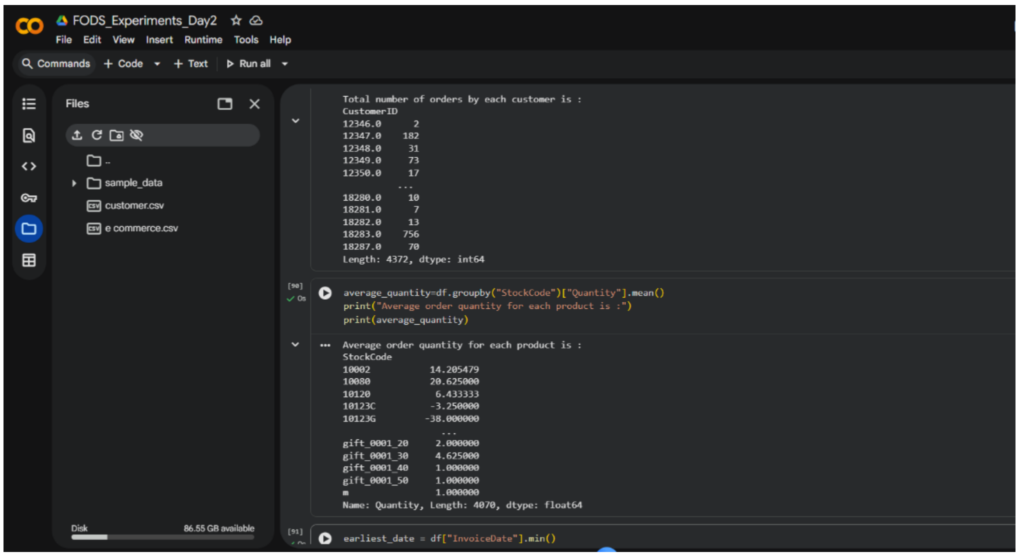
```
  InvoiceNo StockCode                          Description  Quantity  \
0    536365    85123A   WHITE HANGING HEART T-LIGHT HOLDER         6
1    536365     71053                  WHITE METAL LANTERN         6
2    536365    84406B       CREAM CUPID HEARTS COAT HANGER         8
3    536365    84029G  KNITTED UNION FLAG HOT WATER BOTTLE         6
4    536365    84029E       RED WOOLLY HOTTIE WHITE HEART.         6

      InvoiceDate  UnitPrice  CustomerID         Country
0  12/1/2010 8:26       2.55     17850.0  United Kingdom
1  12/1/2010 8:26       3.39     17850.0  United Kingdom
2  12/1/2010 8:26       2.75     17850.0  United Kingdom
3  12/1/2010 8:26       3.39     17850.0  United Kingdom
4  12/1/2010 8:26       3.39     17850.0  United Kingdom
```

```
df["InvoiceDate"] = pd.to_datetime(df["InvoiceDate"])
```

```
total_orders=df.groupby("CustomerID").size()
print("Total number of orders by each customer is :")
print(total_orders)
```

```
Total number of orders by each customer is :
CustomerID
12346.0      2
12347.0    182
```

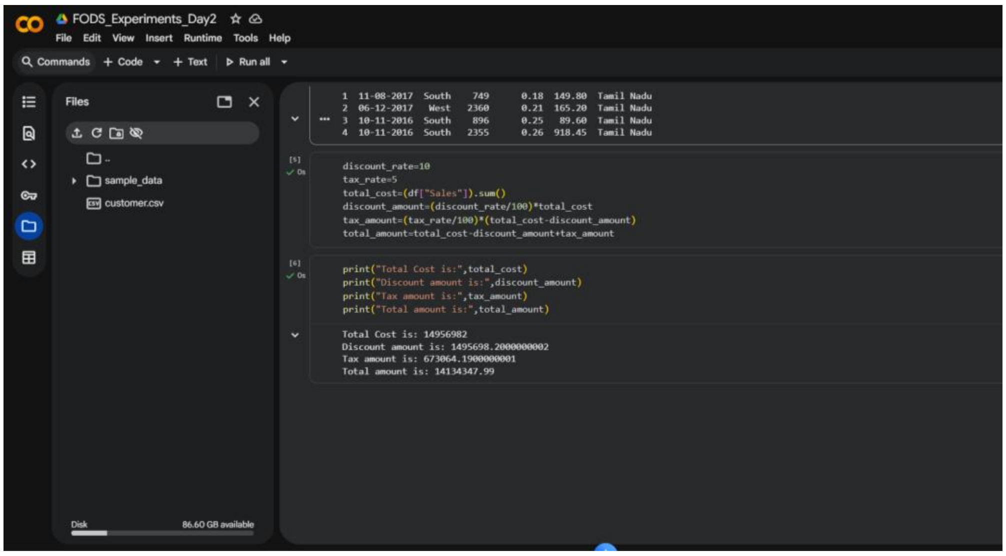


```
Total number of orders by each customer is :
CustomerID
12346.0      2
12347.0    182
12348.0     31
12349.0     73
12350.0     17
          ...
18280.0     10
18281.0      7
18282.0     13
18283.0    756
18287.0     70
Length: 4372, dtype: int64
```

```
average_quantity=df.groupby("StockCode")["Quantity"].mean()
print("Average order quantity for each product is :")
print(average_quantity)
```

```
Average order quantity for each product is :
StockCode
10002           14.205479
10080           20.625000
10120            6.433333
10123C          -3.250000
10123G         -38.000000
                  ...
gift_0001_20     2.000000
gift_0001_30     4.625000
gift_0001_40     1.000000
gift_0001_50     1.000000
m                1.000000
Name: Quantity, Length: 4070, dtype: float64
```

```
earliest_date = df["InvoiceDate"].min()
```



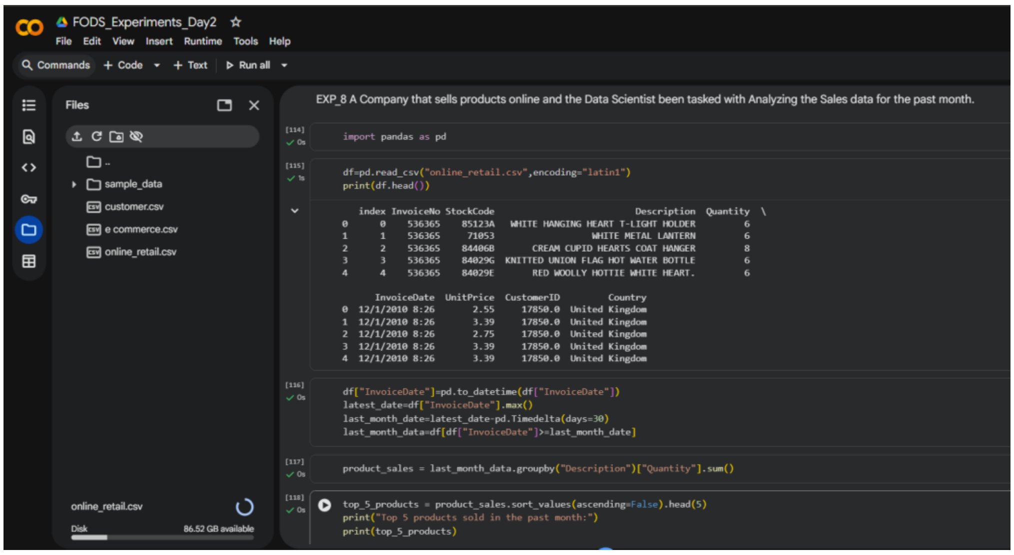
```
1  11-08-2017  South    749      0.18  149.80  Tamil Nadu
2  06-12-2017   West   2360      0.21  165.20  Tamil Nadu
3  10-11-2016  South    896      0.25   89.60  Tamil Nadu
4  10-11-2016  South   2355      0.26  918.45  Tamil Nadu
```

```
discount_rate=10
tax_rate=5
total_cost=(df["Sales"]).sum()
discount_amount=(discount_rate/100)*total_cost
tax_amount=(tax_rate/100)*(total_cost-discount_amount)
total_amount=total_cost-discount_amount+tax_amount
```

```
print("Total Cost is:",total_cost)
print("Discount amount is:",discount_amount)
print("Tax amount is:",tax_amount)
print("Total amount is:",total_amount)
```

```
Total Cost is: 14956982
Discount amount is: 1495698.2000000002
Tax amount is: 673064.1900000001
Total amount is: 14134347.99
```

EXP_8 A Company that sells products online and the Data Scientist been tasked with Analyzing the Sales data for the past month.



EXP_8 A Company that sells products online and the Data Scientist been tasked with Analyzing the Sales data for the past month.

```
import pandas as pd
```

```
df=pd.read_csv("online_retail.csv",encoding="latin1")
print(df.head())
```

```
   index InvoiceNo StockCode                          Description  Quantity  \
0      0    536365    85123A   WHITE HANGING HEART T-LIGHT HOLDER         6
1      1    536365     71053                  WHITE METAL LANTERN         6
2      2    536365    84406B       CREAM CUPID HEARTS COAT HANGER         8
3      3    536365    84029G  KNITTED UNION FLAG HOT WATER BOTTLE         6
4      4    536365    84029E       RED WOOLLY HOTTIE WHITE HEART.         6

      InvoiceDate  UnitPrice  CustomerID         Country
0  12/1/2010 8:26       2.55     17850.0  United Kingdom
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3  12/1/2010 8:26       3.39     17850.0  United Kingdom
4  12/1/2010 8:26       3.39     17850.0  United Kingdom
```
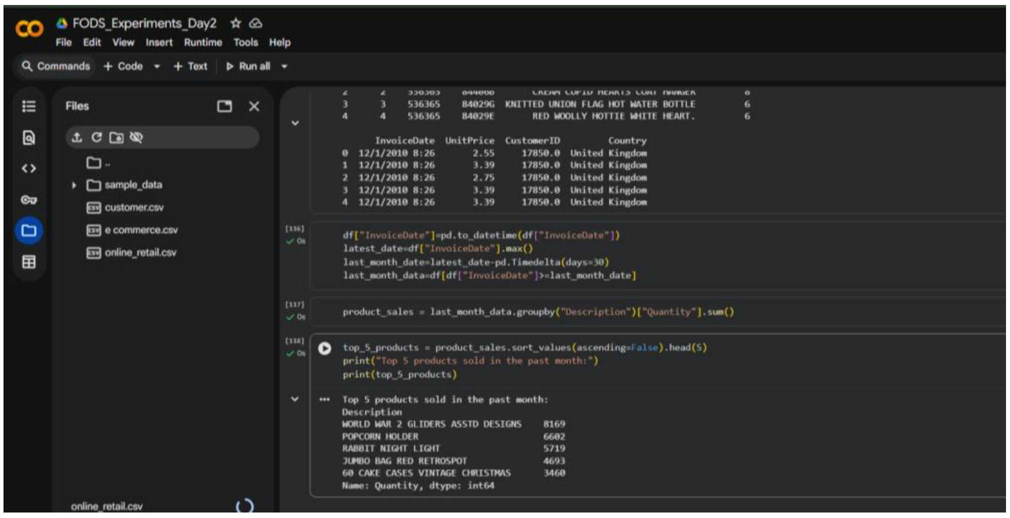

```
df["InvoiceDate"]=pd.to_datetime(df["InvoiceDate"])
latest_date=df["InvoiceDate"].max()
last_month_date=latest_date-pd.Timedelta(days=30)
last_month_data=df[df["InvoiceDate"]>=last_month_date]
```

```
product_sales = last_month_data.groupby("Description")["Quantity"].sum()
```

```
top_5_products = product_sales.sort_values(ascending=False).head(5)
print("Top 5 products sold in the past month:")
print(top_5_products)
```



```
3     3    536365    84029G  KNITTED UNION FLAG HOT WATER BOTTLE        6
4     4    536365    84029E       RED WOOLLY HOTTIE WHITE HEART.        6

      InvoiceDate  UnitPrice  CustomerID         Country
0  12/1/2010 8:26       2.55     17850.0  United Kingdom
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2  12/1/2010 8:26       2.75     17850.0  United Kingdom
3  12/1/2010 8:26       3.39     17850.0  United Kingdom
4  12/1/2010 8:26       3.39     17850.0  United Kingdom
```

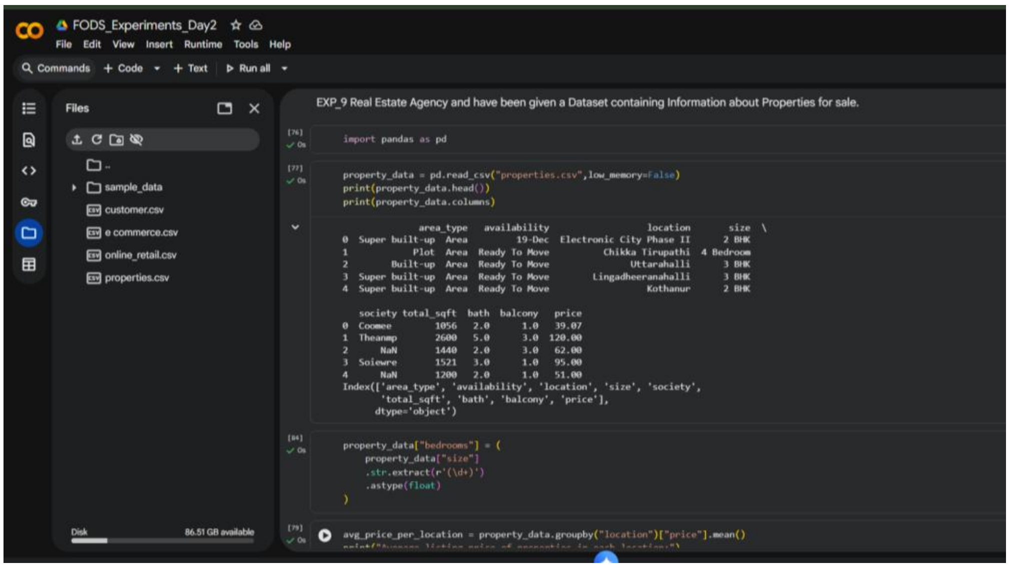
```
df["InvoiceDate"]=pd.to_datetime(df["InvoiceDate"])
latest_date=df["InvoiceDate"].max()
last_month_date=latest_date-pd.Timedelta(days=30)
last_month_data=df[df["InvoiceDate"]>=last_month_date]
```

```
product_sales = last_month_data.groupby("Description")["Quantity"].sum()
```

```
top_5_products = product_sales.sort_values(ascending=False).head(5)
print("Top 5 products sold in the past month:")
print(top_5_products)
```

```
Top 5 products sold in the past month:
Description
WORLD WAR 2 GLIDERS ASSTD DESIGNS    8169
POPCORN HOLDER                       6602
RABBIT NIGHT LIGHT                   5719
JUMBO BAG RED RETROSPOT              4693
60 CAKE CASES VINTAGE CHRISTMAS      3460
Name: Quantity, dtype: int64
```

EXP_9 Real Estate Agency and have been given a Dataset containing Information about Properties for sale.



EXP_9 Real Estate Agency and have been given a Dataset containing Information about Properties for sale.

```
import pandas as pd
```

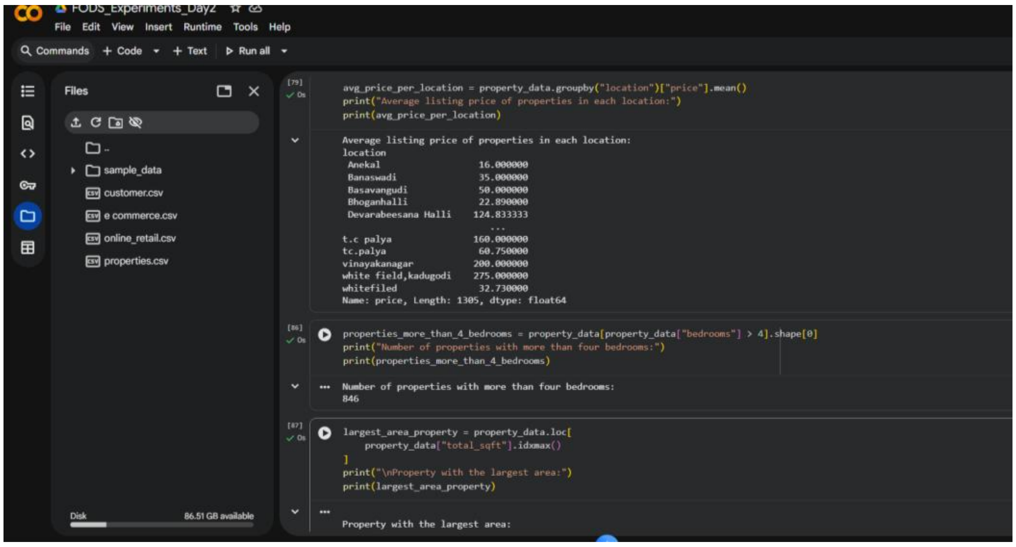
```
property_data = pd.read_csv("properties.csv",low_memory=False)
print(property_data.head())
print(property_data.columns)
```

```
              area_type   availability                  location       size  \
0  Super built-up  Area         19-Dec  Electronic City Phase II      2 BHK
1            Plot  Area   Ready To Move          Chikka Tirupathi  4 Bedroom
2        Built-up  Area   Ready To Move               Uttarahalli      3 BHK
3  Super built-up  Area   Ready To Move        Lingadheeranahalli      3 BHK
4  Super built-up  Area   Ready To Move                  Kothanur      2 BHK

  society total_sqft  bath  balcony   price
0  Coomee       1056   2.0      1.0   39.07
1  Theanmp      2600   5.0      3.0  120.00
2     NaN       1440   2.0      3.0   62.00
3  Soiewre      1521   3.0      1.0   95.00
4     NaN       1200   2.0      1.0   51.00
Index(['area_type', 'availability', 'location', 'size', 'society',
       'total_sqft', 'bath', 'balcony', 'price'],
      dtype='object')
```

```
property_data["bedrooms"] = (
    property_data["size"]
    .str.extract(r'(\d+)')
    .astype(float)
)
```

```
avg_price_per_location = property_data.groupby("location")["price"].mean()
```



```
[79]
avg_price_per_location = property_data.groupby("location")["price"].mean()
print("Average listing price of properties in each location:")
print(avg_price_per_location)
```

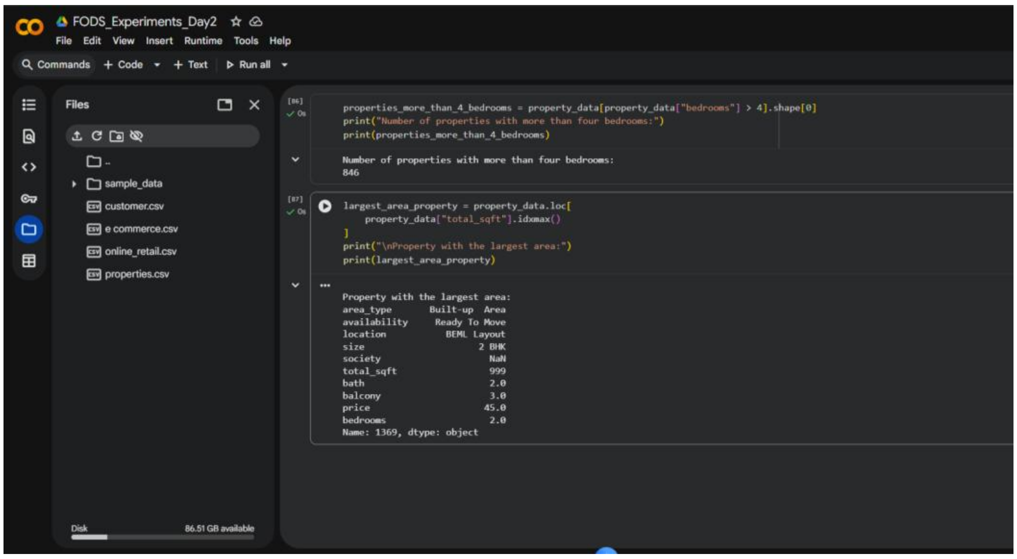
```
Average listing price of properties in each location:
location
 Anekal                  16.000000
 Banaswadi               35.000000
 Basavangudi             50.000000
 Bhoganhalli             22.890000
 Devarabeesana Halli    124.833333
                           ...
t.c palya              160.000000
tc.palya                60.750000
vinayakanagar          200.000000
white field,kadugodi   275.000000
whitefiled              32.730000
Name: price, Length: 1305, dtype: float64
```

```
[86]
properties_more_than_4_bedrooms = property_data[property_data["bedrooms"] > 4].shape[0]
print("Number of properties with more than four bedrooms:")
print(properties_more_than_4_bedrooms)
```

```
Number of properties with more than four bedrooms:
846
```

```
[87]
largest_area_property = property_data.loc[
    property_data["total_sqft"].idxmax()
]
print("\nProperty with the largest area:")
print(largest_area_property)
```

```
Property with the largest area:
```



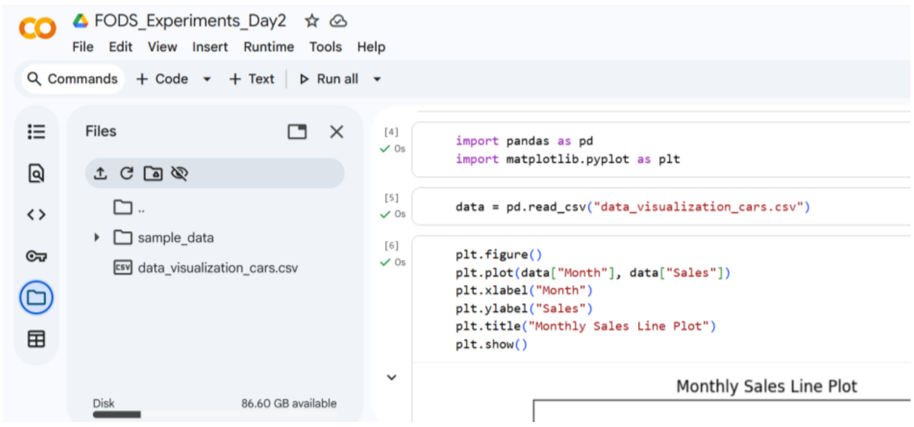
```
[86]
properties_more_than_4_bedrooms = property_data[property_data["bedrooms"] > 4].shape[0]
print("Number of properties with more than four bedrooms:")
print(properties_more_than_4_bedrooms)
```

```
Number of properties with more than four bedrooms:
846
```

```
[87]
largest_area_property = property_data.loc[
    property_data["total_sqft"].idxmax()
]
print("\nProperty with the largest area:")
print(largest_area_property)
```

```
Property with the largest area:
area_type       Built-up  Area
availability      Ready To Move
location            BEML Layout
size                      2 BHK
society                     NaN
total_sqft                  999
bath                        2.0
balcony                     3.0
price                      45.0
bedrooms                    2.0
Name: 1369, dtype: object
```

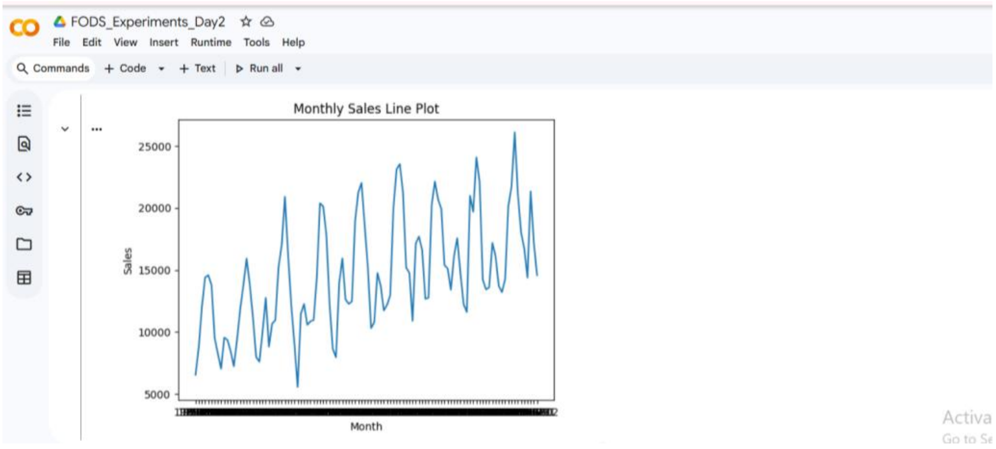
EXP_10 Data visualization project and need to create basic plots using Matplotlib.

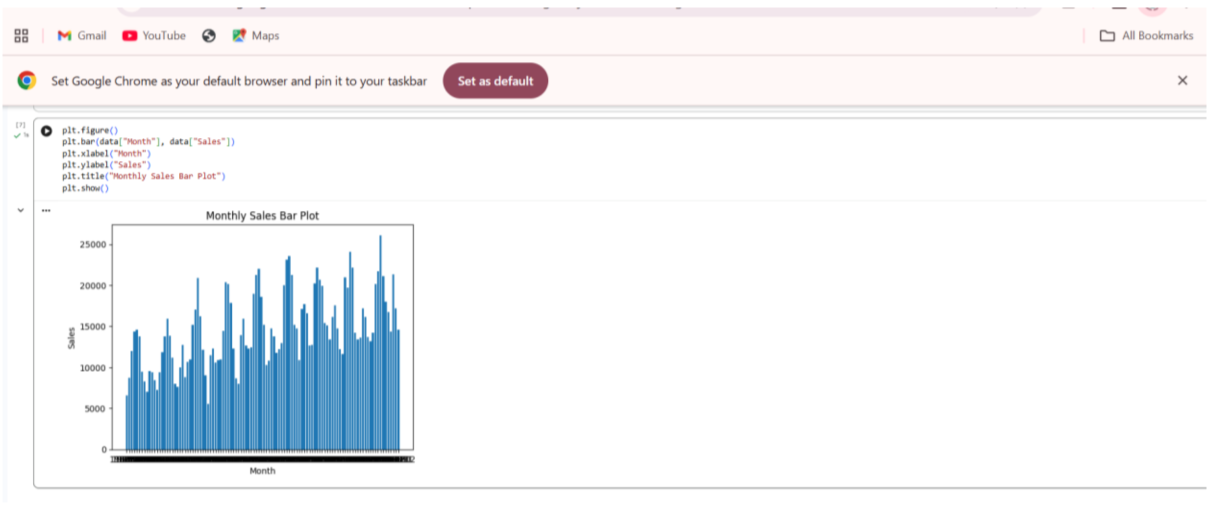

FODS_Experiments_Day2
File Edit View Insert Runtime Tools Help
Commands + Code + Text Run all
Files
sample_data
data_visualization_cars.csv
Disk 86.60 GB available
Monthly Sales Line Plot

```
[4]
import pandas as pd
import matplotlib.pyplot as plt
```

```
[5]
data = pd.read_csv("data_visualization_cars.csv")
```

```
[6]
plt.figure()
plt.plot(data["Month"], data["Sales"])
plt.xlabel("Month")
plt.ylabel("Sales")
plt.title("Monthly Sales Line Plot")
plt.show()
```





```
[7]
plt.figure()
plt.bar(data["Month"], data["Sales"])
plt.xlabel("Month")
plt.ylabel("Sales")
plt.title("Monthly Sales Bar Plot")
plt.show()
```