applied-data-science-phase-3-1

October 28, 2023

1 Date - 26/10/2023

2 Team ID - 3872

3 Project Title - Product Demand Prediction using ML

4 Importing Dependencies

```
[11]: import pandas as pd
      import re
      import matplotlib.pyplot as plt
      import os
      import plotly.express as px
      import numpy as np
      import seaborn as sns
      import matplotlib.pyplot as plt
```

5 Loading Dataset

```
[2]: df = pd.read_csv("F:\\Applied_dataScience_Phase4\\trainnew.csv")
```

6 Data Exploration

```
[3]: df
```

```
[3]:             date  store  item  sales
     0       01-01-2013      1     1     13
     1       02-01-2013      1     1     11
     2       03-01-2013      1     1     14
     3       04-01-2013      1     1     13
     4       05-01-2013      1     1     10
     …             …     …     …     …
     912995  27-12-2017     10    50     63
     912996  28-12-2017     10    50     59
     912997  29-12-2017     10    50     74
```

```
912998  30-12-2017     10     50      62
912999  31-12-2017     10     50      82

[913000 rows x 4 columns]
```

[4]:

```
df.set_index('date',inplace=True)
```

[5]:

```
df.head()
```

[5]:

```
            store  item  sales
date
01-01-2013      1     1     13
02-01-2013      1     1     11
03-01-2013      1     1     14
04-01-2013      1     1     13
05-01-2013      1     1     10
```

[9]:

```
df.tail()
```

[9]:

```
            store  item  sales
date
27-12-2017     10    50     63
28-12-2017     10    50     59
29-12-2017     10    50     74
30-12-2017     10    50     62
31-12-2017     10    50     82
```

[6]:

```
df.describe()
```

[6]:

```
               store           item          sales
count  913000.000000  913000.000000  913000.000000
mean        5.500000      25.500000      52.250287
std         2.872283      14.430878      28.801144
min         1.000000       1.000000       0.000000
25%         3.000000      13.000000      30.000000
50%         5.500000      25.500000      47.000000
75%         8.000000      38.000000      70.000000
max        10.000000      50.000000     231.000000
```

[7]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
Index: 913000 entries, 01-01-2013 to 31-12-2017
Data columns (total 3 columns):
 #   Column  Non-Null Count   Dtype
---  ------  --------------   -----
 0   store   913000 non-null  int64
 1   item    913000 non-null  int64
 2   sales   913000 non-null  int64
dtypes: int64(3)
memory usage: 27.9+ MB
```

[8]:
```
df.shape
```

[8]:
```
(913000, 3)
```

[7]:
```
store_sales=df.groupby(by='store')[['sales']].sum()
store_sales
```

[7]:
```
         sales
store
1      4315603
2      6120128
3      5435144
4      5012639
5      3631016
6      3627670
7      3320009
8      5856169
9      5025976
10     5360158
```

[8]:
```
store=store_sales.index
store
```

[8]:
```
Int64Index([1, 2, 3, 4, 5, 6, 7, 8, 9, 10], dtype='int64', name='store')
```

7 Pre-Processing and Visualisation of Data

[9]:
```
fig = px.bar(store_sales,color=store)
fig.show()
```

[10]:
```
fig = px.histogram(df[df.item==1][['sales']],labels=dict(value="Sales"))
fig.show()
```

[11]:
```
fig = px.line(df[(df.item==1) & (df.store==4)][['sales']],y='sales')
fig.show()
```

[12]:
```
df_1_1=df[(df.item==1) & (df.store==1)][['sales']]
df_1_1
```

[12]:
```
            sales
date
```

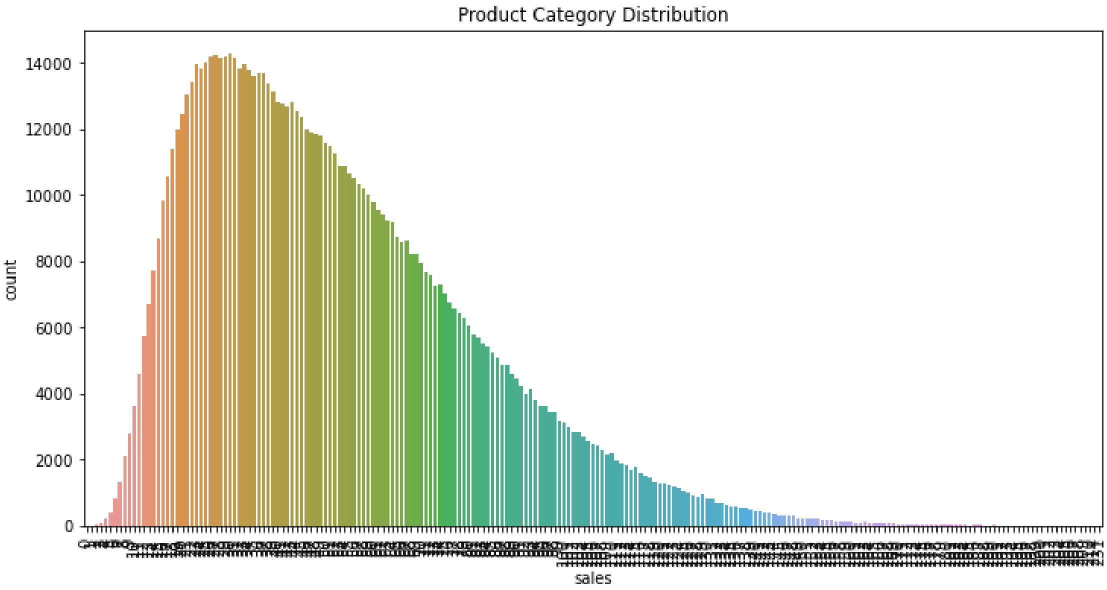
```
01-01-2013     13
02-01-2013     11
03-01-2013     14
04-01-2013     13
05-01-2013     10
…            …
27-12-2017     14
28-12-2017     19
29-12-2017     15
30-12-2017     27
31-12-2017     23

[1826 rows x 1 columns]
```

[13]:

```python
fig = px.line(df_1_1)
fig.show()
```

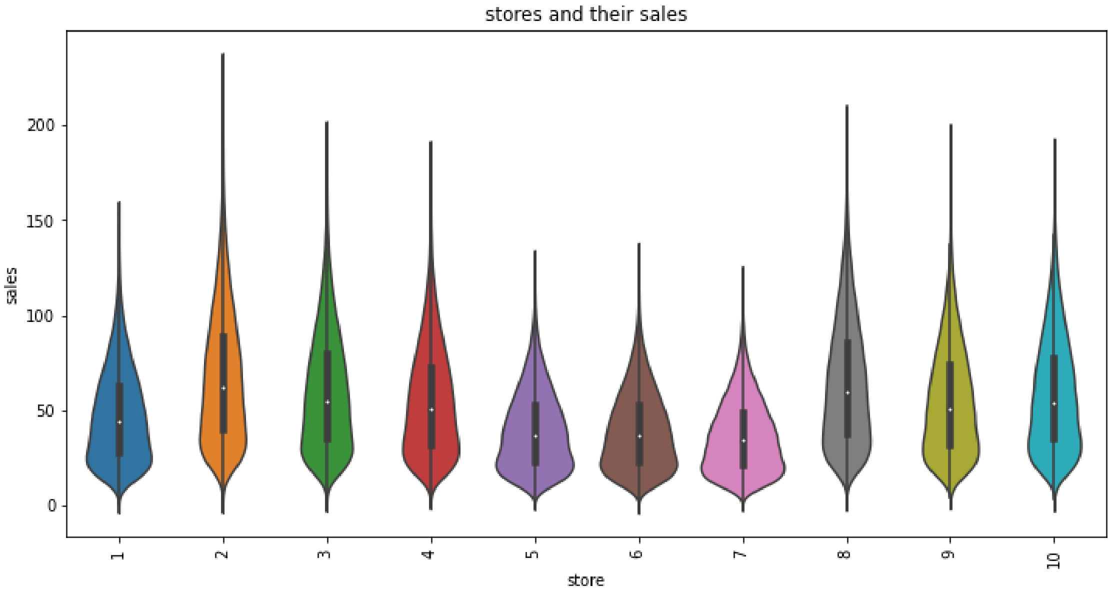
[16]:

```python
plt.figure(figsize=(12, 6))
sns.countplot(data=df, x='sales')
plt.title('Product Category Distribution')
plt.xticks(rotation=90)
plt.show()
```



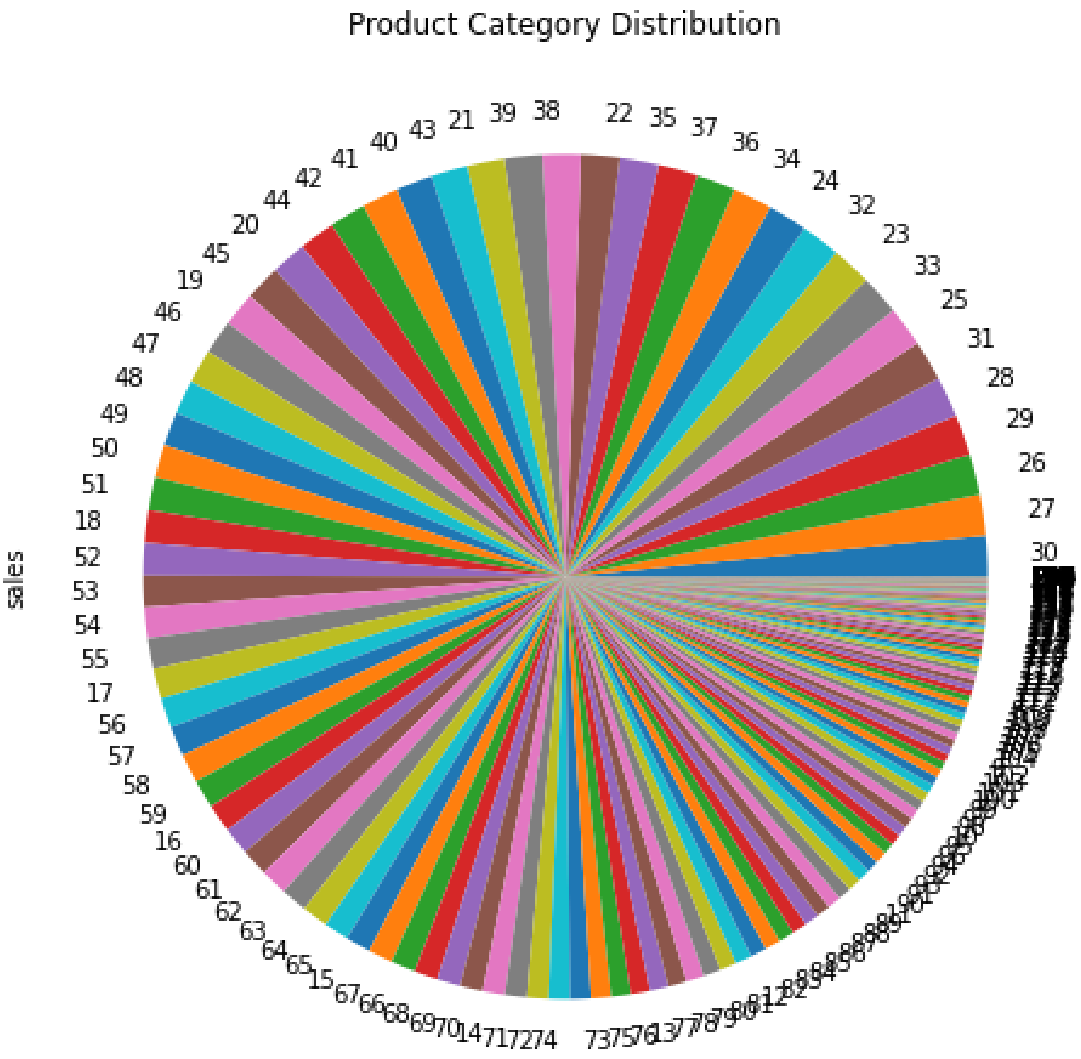
[17]:

```python
plt.figure(figsize=(12, 6))
sns.violinplot(data=df, x='store', y='sales')
plt.title('stores and their sales')
plt.xticks(rotation=90)
plt.show()
```



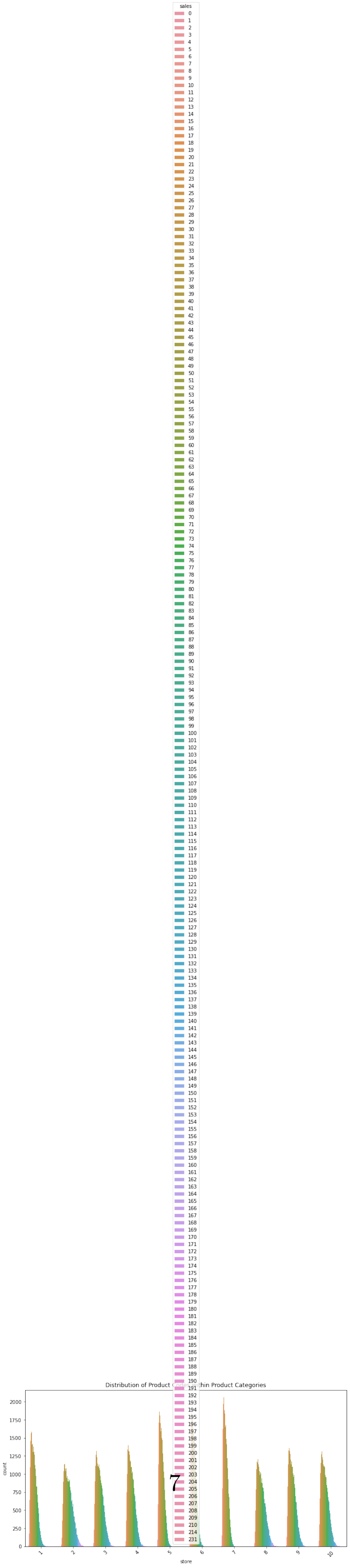
[19]:
```
plt.figure(figsize=(8, 8))
df['sales'].value_counts().plot.pie()
plt.title('Product Category Distribution')
```

[19]:
```
Text(0.5, 1.0, 'Product Category Distribution')
```



[22]:
```
plt.figure(figsize=(12, 6))
sns.countplot(data=df, x='store', hue='sales')
plt.title('Distribution of Product Codes within Product Categories')
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```

```
C:\Users\Dell\AppData\Local\Temp\ipykernel_4296\2646529376.py:5: UserWarning:
Tight layout not applied. The bottom and top margins cannot be made large enough
to accommodate all axes decorations.
  plt.tight_layout()
```


Distribution of Product Codes within Product Categories
sales
0
1
2
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10
11
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14
15
16
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20
21
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201
202
203
204
205
206
207
208
209
210
214
231
count
2000
1750
1500
1250
1000
750
500
250
0
1
2
3
4
5
6
7
8
9
10
store

[ ]:

```
```