Date - 26/10/2023

Team ID - 3872

Project Title - Product Demand Prediction using ML

Importing Dependencies

In [ ]:
```
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
```

Loading Dataset

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

Data Exploration

In [ ]:
```
df
```

Out[ ]:

	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 × 4 columns

In [ ]:
```
df.set_index('date',inplace=True)
```

In [ ]:
```
df.head()
```

Out[ ]:

	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

In [ ]:
```
df.tail()
```

Out[ ]:

date	store	item	sales
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

In [ ]:
```
df.describe()
```

Out[ ]:

	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

In [ ]:
```
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
```

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

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

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

Out[ ]:

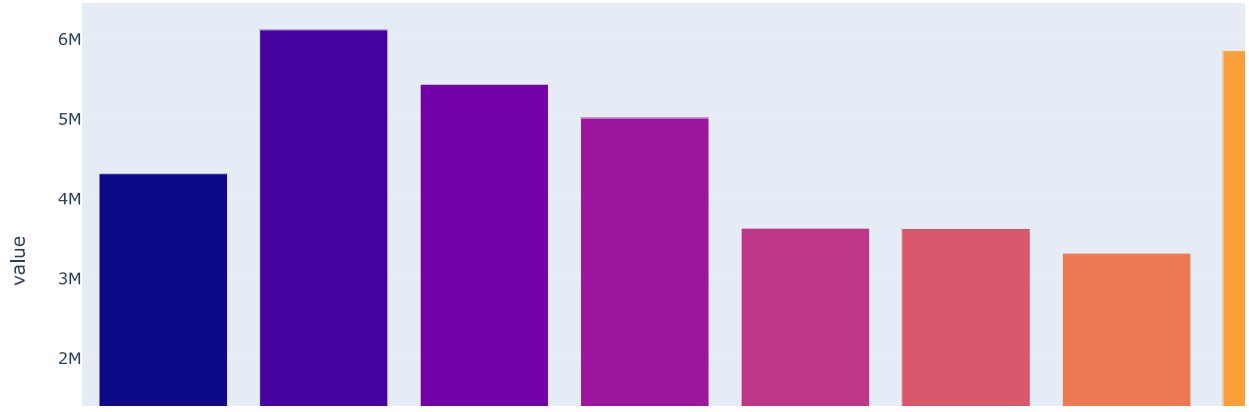
store	sales
1	4315603
2	6120128
3	5435144
4	5012639
5	3631016
6	3627670
7	3320009
8	5856169
9	5025976
10	5360158

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

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

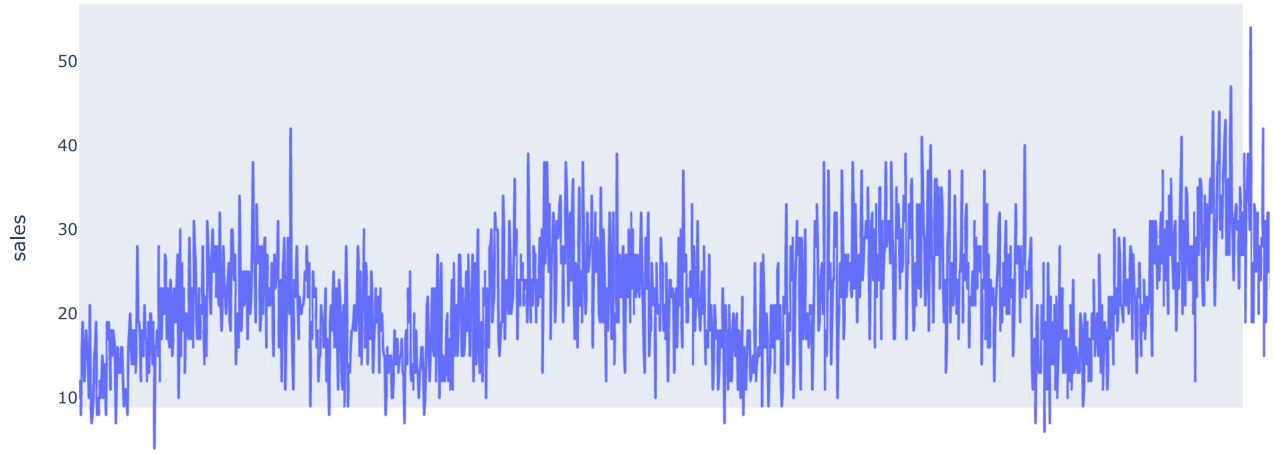
Pre-Processing and Visualisation of Data

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



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

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



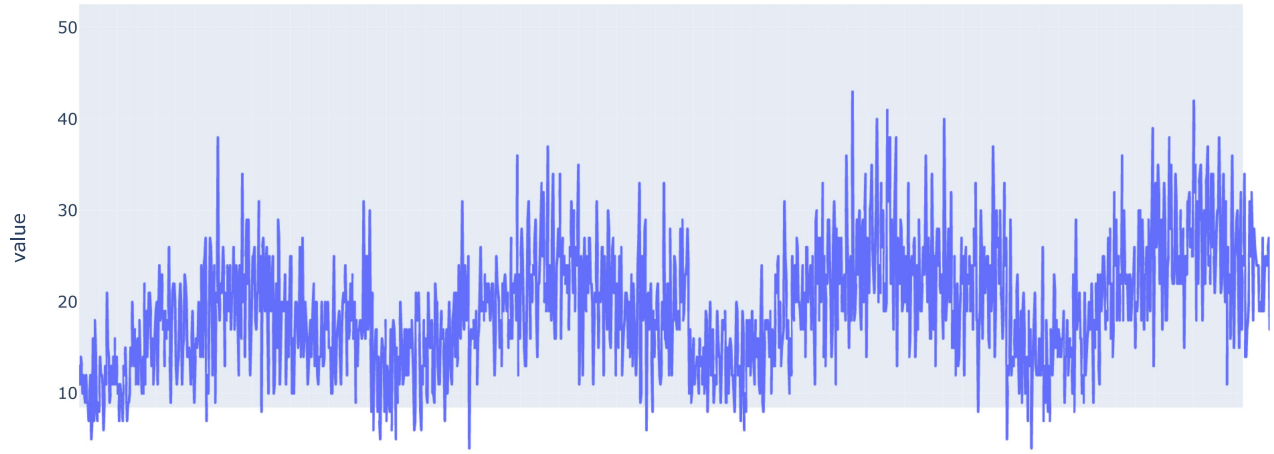
In [ ]:
```
df_1_1=df[(df.item==1) & (df.store==1)][['sales']]
df_1_1
```

Out[ ]:

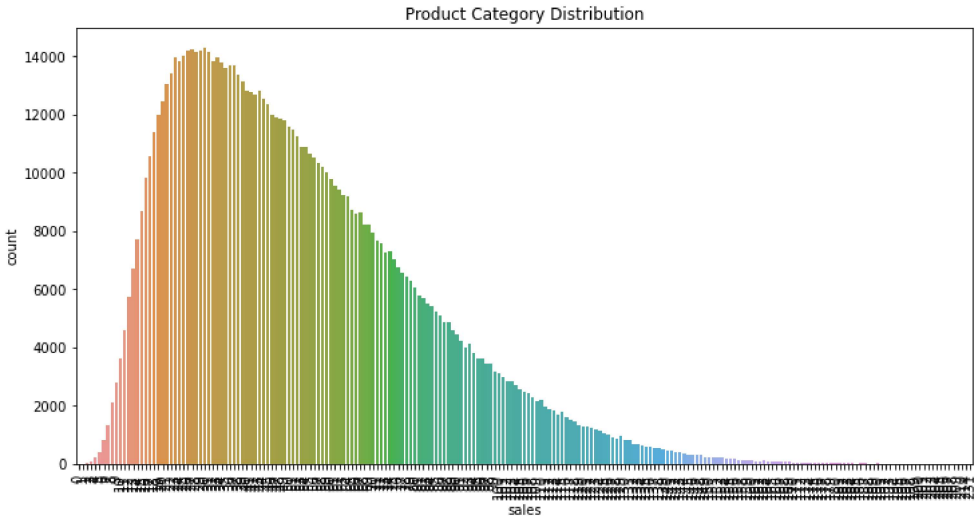
date	sales
01-01-2013	13
02-01-2013	11
03-01-2013	14
04-01-2013	13
05-01-2013	10
...	...
27-12-2017	14
28-12-2017	19
29-12-2017	15
30-12-2017	27
31-12-2017	23

1826 rows × 1 columns

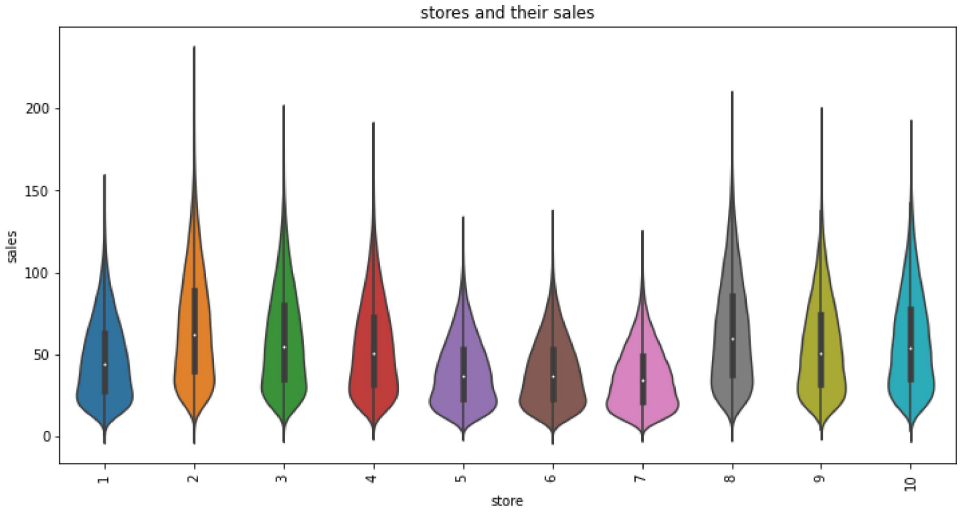
In [ ]:
```
fig = px.line(df_1_1)
fig.show()
```



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

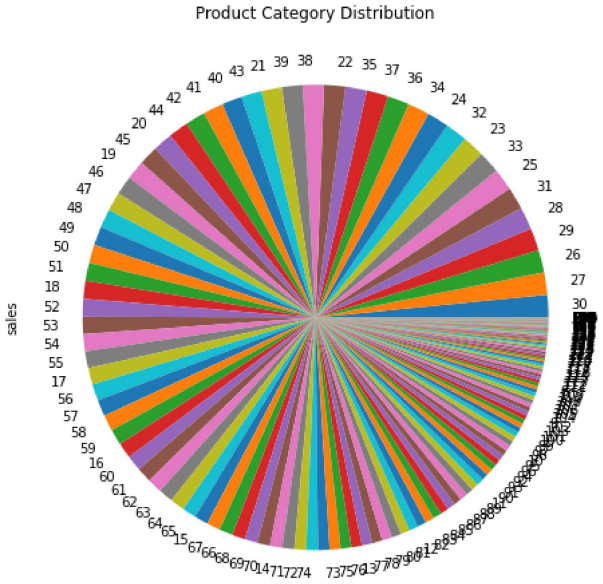


In [ ]:
```
plt.figure(figsize=(12, 6))
sns.violinplot(data=df, x='store', y='sales')
plt.title('stores and their sales')
plt.xticks(rotation=90)
plt.show()
```



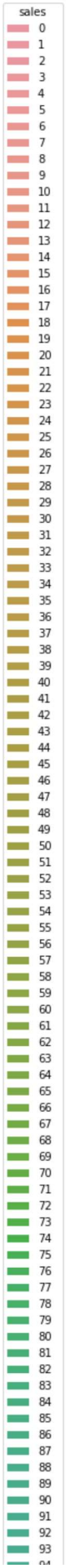
In [ ]:
```
plt.figure(figsize=(8, 8))
df['sales'].value_counts().plot.pie()
plt.title('Product Category Distribution')
```

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



In [ ]:
```
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 can
not be made large enough to accommodate all axes decorations.
  plt.tight_layout()
```


sales
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1
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20
21
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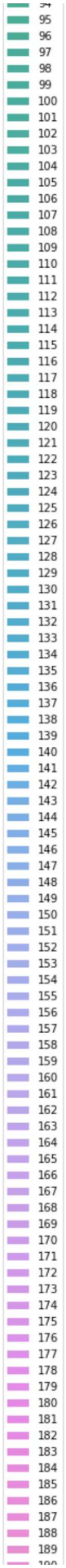
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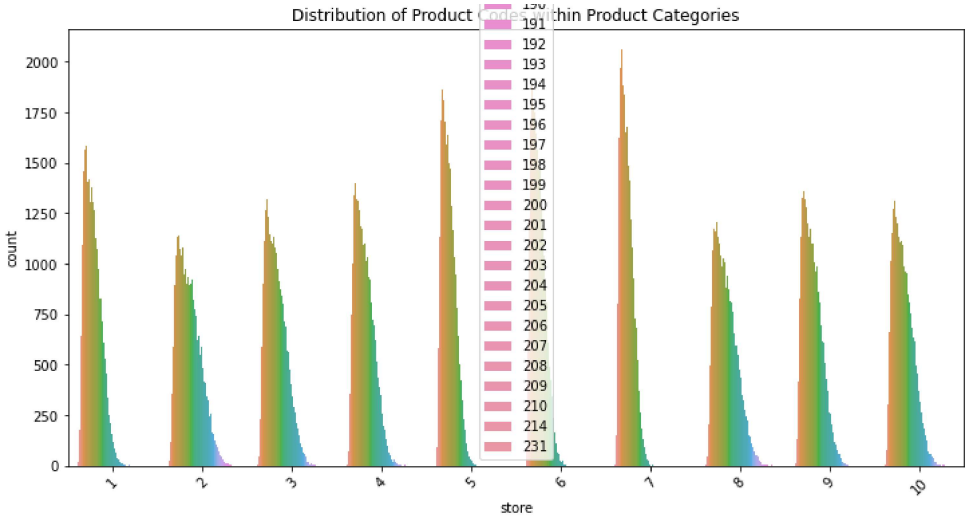
Distribution of Product Codes within Product Categories
count
store
0
250
500
750
1000
1250
1500
1750
2000
1
2
3
4
5
6
7
8
9
10
191
192
193
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214
231

In [ ]: