sales-project

January 1, 2026

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

[4]:
```
df=pd.read_csv("sales.csv")
df
```

[4]:

	Date	Time	State	Group	Unit	Sales
0	01-Oct-20	Morning	WA	Kids	8	20000
1	01-Oct-20	Morning	WA	Men	8	20000
2	01-Oct-20	Morning	WA	Women	4	10000
3	01-Oct-20	Morning	WA	Seniors	15	37500
4	01-Oct-20	Afternoon	WA	Kids	3	7500
…	…	…	…	…	…	…
7555	30-Dec-20	Afternoon	TAS	Seniors	14	35000
7556	30-Dec-20	Evening	TAS	Kids	15	37500
7557	30-Dec-20	Evening	TAS	Men	15	37500
7558	30-Dec-20	Evening	TAS	Women	11	27500
7559	30-Dec-20	Evening	TAS	Seniors	13	32500

[7560 rows x 6 columns]

[5]:
```
df.head()
```

[5]:

	Date	Time	State	Group	Unit	Sales
0	01-Oct-20	Morning	WA	Kids	8	20000
1	01-Oct-20	Morning	WA	Men	8	20000
2	01-Oct-20	Morning	WA	Women	4	10000
3	01-Oct-20	Morning	WA	Seniors	15	37500
4	01-Oct-20	Afternoon	WA	Kids	3	7500

[6]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7560 entries, 0 to 7559
Data columns (total 6 columns):
 #   Column  Non-Null Count  Dtype
```

```
---  ------  --------------  -----
 0   Date    7560 non-null   object
 1   Time    7560 non-null   object
 2   State   7560 non-null   object
 3   Group   7560 non-null   object
 4   Unit    7560 non-null   int64
 5   Sales   7560 non-null   int64
dtypes: int64(2), object(4)
memory usage: 354.5+ KB
```

[8]:
```
df.describe()
```

[8]:
```
              Unit          Sales
count  7560.000000    7560.000000
mean     18.005423   45013.558201
std      12.901403   32253.506944
min       2.000000    5000.000000
25%       8.000000   20000.000000
50%      14.000000   35000.000000
75%      26.000000   65000.000000
max      65.000000  162500.000000
```

[9]:
```
df.isnull().sum()
```

[9]:
```
Date     0
Time     0
State    0
Group    0
Unit     0
Sales    0
dtype: int64
```

[10]:
```
df.notna().sum()
```

[10]:
```
Date     7560
Time     7560
State    7560
Group    7560
Unit     7560
Sales    7560
dtype: int64
```

[12]:
```
df['Sales'].fillna(df['Sales'].median(), inplace=True)
df['Unit'].fillna(df['Unit'].median(), inplace=True)
df['State'].fillna(df['State'].mode()[0], inplace=True)
df['Group'].fillna(df['Group'].mode()[0], inplace=True)
```

[13]:
```
from sklearn.preprocessing import MinMaxScaler

scaler = MinMaxScaler()
df[['Sales_Norm','Unit_Norm']] = scaler.fit_transform(df[['Sales','Unit']])
df.head()
```

[13]:

	Date	Time	State	Group	Unit	Sales	Sales_Norm	Unit_Norm
0	01-Oct-20	Morning	WA	Kids	8	20000	0.095238	0.095238
1	01-Oct-20	Morning	WA	Men	8	20000	0.095238	0.095238
2	01-Oct-20	Morning	WA	Women	4	10000	0.031746	0.031746
3	01-Oct-20	Morning	WA	Seniors	15	37500	0.206349	0.206349
4	01-Oct-20	Afternoon	WA	Kids	3	7500	0.015873	0.015873

[14]:
```
state_sales = df.groupby('State')['Sales'].sum().reset_index()
state_sales
```

[14]:

	State	Sales
0	NSW	74970000
1	NT	22580000
2	QLD	33417500
3	SA	58857500
4	TAS	22760000
5	VIC	105565000
6	WA	22152500

[15]:
```
df[['Sales','Unit']].describe()
```

[15]:

	Sales	Unit
count	7560.000000	7560.000000
mean	45013.558201	18.005423
std	32253.506944	12.901403
min	5000.000000	2.000000
25%	20000.000000	8.000000
50%	35000.000000	14.000000
75%	65000.000000	26.000000
max	162500.000000	65.000000

[16]:
```
mean_sales = df['Sales'].mean()
median_sales = df['Sales'].median()
mode_sales = df['Sales'].mode()[0]
std_sales = df['Sales'].std()
```

[17]:
```
group_sales = df.groupby('Group')['Sales'].sum().reset_index()

highest_group = group_sales.loc[group_sales['Sales'].idxmax()]
lowest_group = group_sales.loc[group_sales['Sales'].idxmin()]
```

[18]:
```
highest_state = state_sales.loc[state_sales['Sales'].idxmax()]
lowest_state = state_sales.loc[state_sales['Sales'].idxmin()]
```

[19]:
```
highest_group
```

[19]:
```
Group         Men
Sales    85750000
Name: 1, dtype: object
```

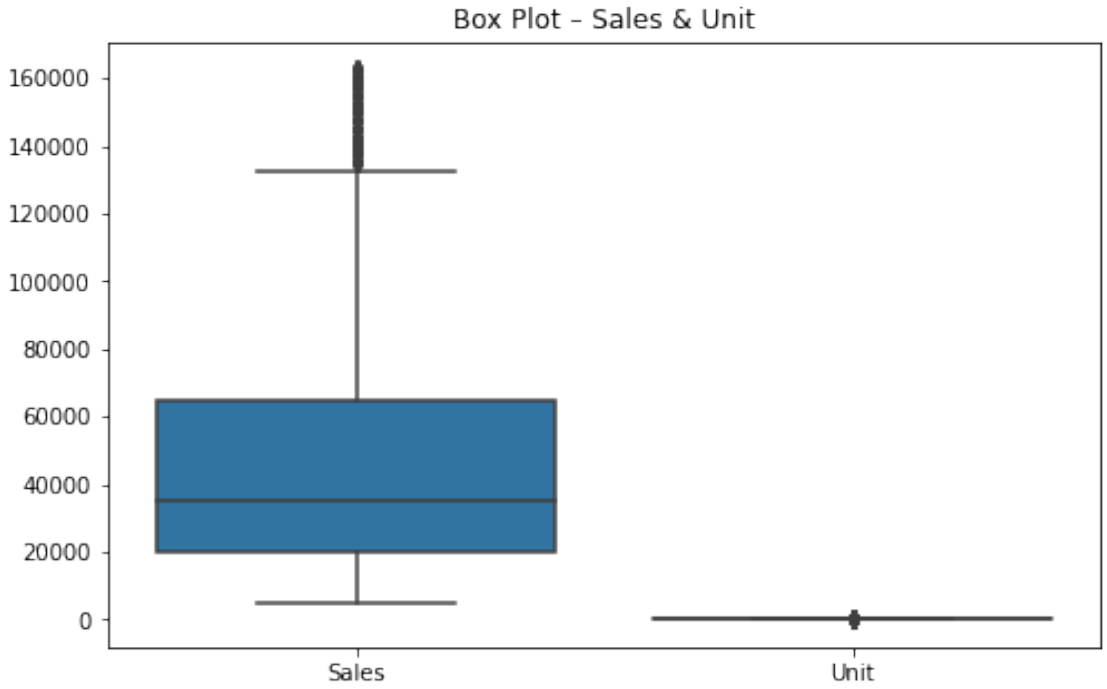
[20]:
```
highest_state
```

[20]:
```
State          VIC
Sales    105565000
Name: 5, dtype: object
```

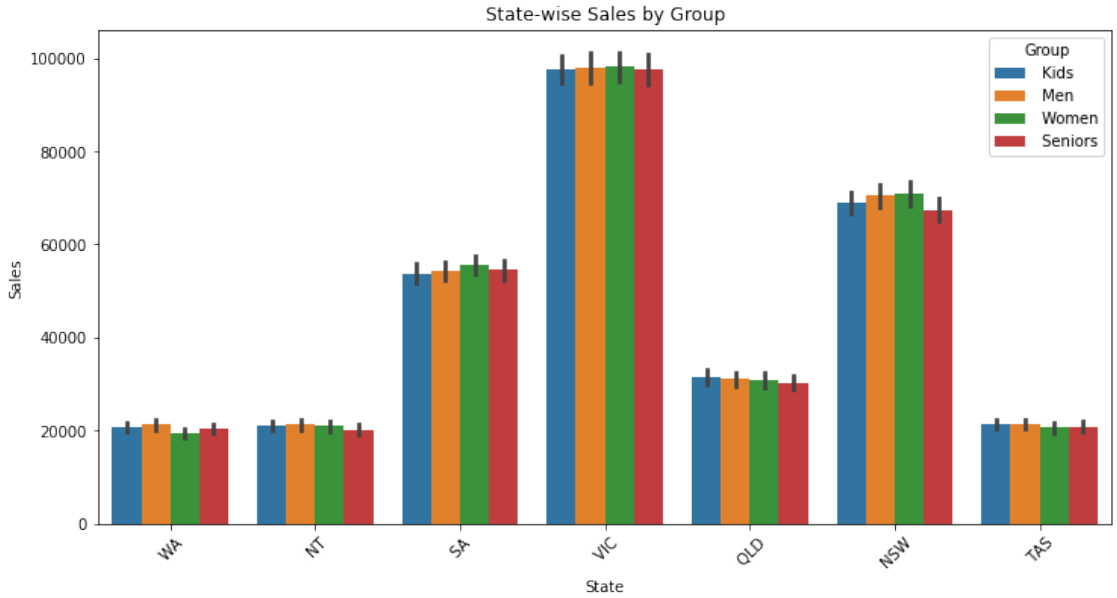
[21]:
```
df['Date'] = pd.to_datetime(df['Date'])

weekly_sales = df.resample('W', on='Date')['Sales'].sum()
monthly_sales = df.resample('M', on='Date')['Sales'].sum()
quarterly_sales = df.resample('Q', on='Date')['Sales'].sum()
```

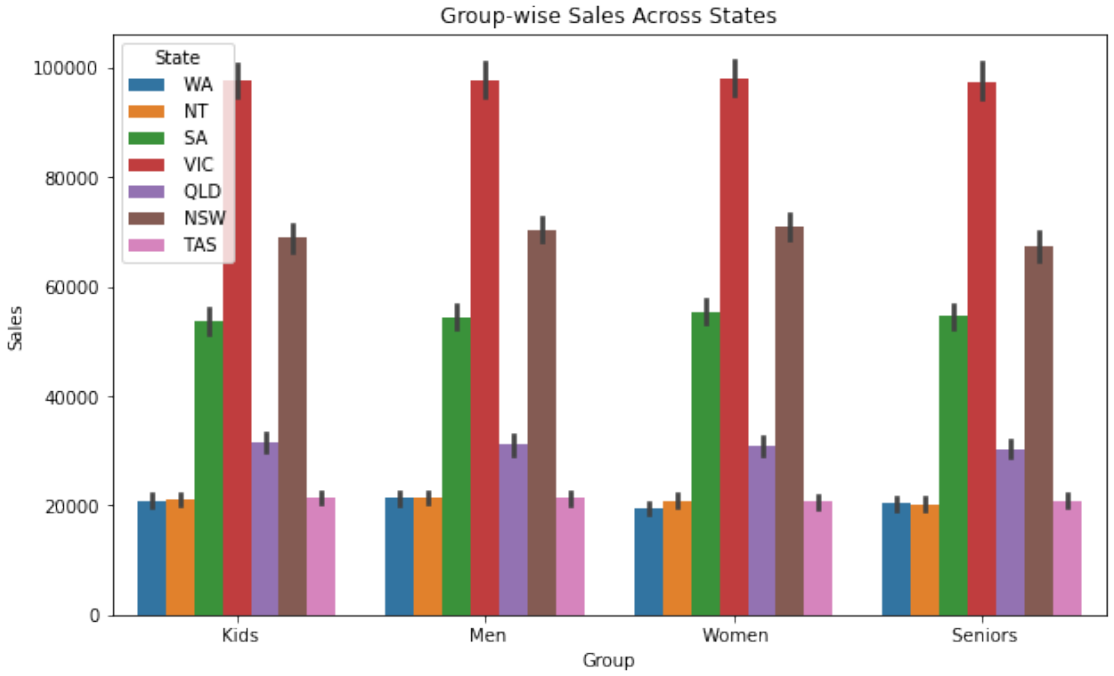
[22]:
```
plt.figure(figsize=(8,5))
sns.boxplot(data=df[['Sales','Unit']])
plt.title("Box Plot - Sales & Unit")
plt.show()
```



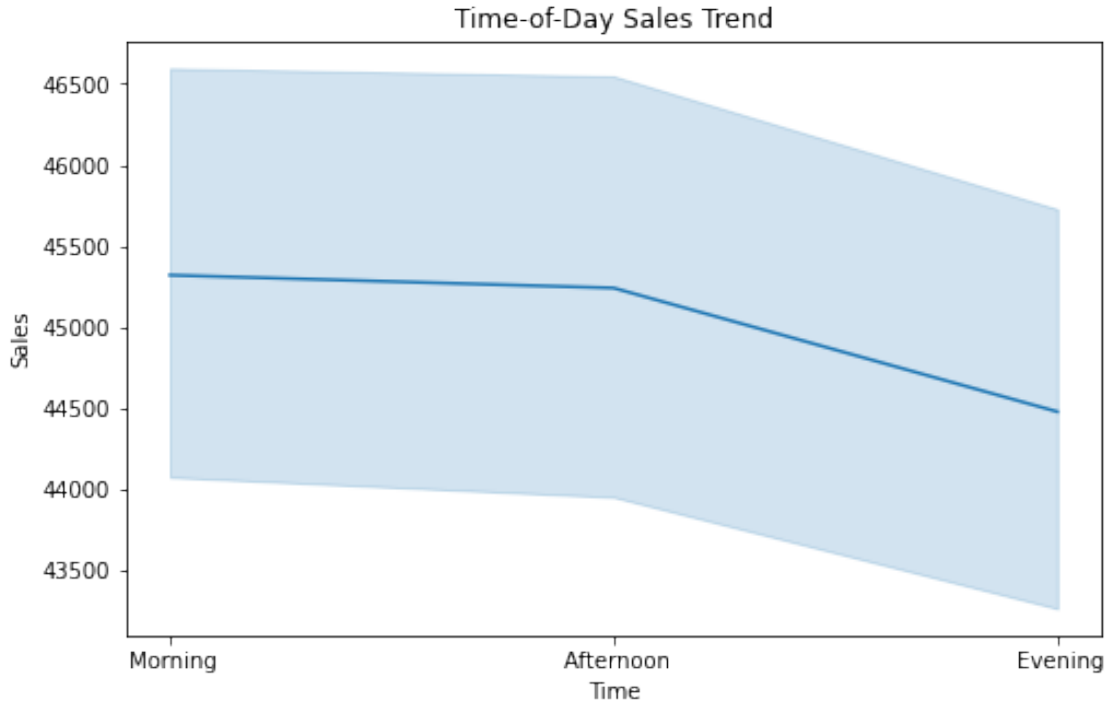
[23]:
```
plt.figure(figsize=(12,6))
sns.barplot(x='State', y='Sales', hue='Group', data=df)
plt.title("State-wise Sales by Group")
plt.xticks(rotation=45)
plt.show()
```



[24]:
```
plt.figure(figsize=(10,6))
sns.barplot(x='Group', y='Sales', hue='State', data=df)
plt.title("Group-wise Sales Across States")
plt.show()
```



[25]:
```
plt.figure(figsize=(8,5))
sns.lineplot(x='Time', y='Sales', data=df)
plt.title("Time-of-Day Sales Trend")
plt.show()
```



[ ]: