Sales and Outlet Analysis for Blinkit Retail Data

Data Import and Exploration

In [5]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

In [6]:

```
df = pd.read_csv("C:/Users/sona3/Downloads/blinkit_data.csv")
```

In [4]:

```
df.head(10)
```

Out[4]:

	Item Fat Content	Item Identifier	Item Type	Outlet Establishment Year	Outlet Identifier	Outlet Location Type	Outlet Size	Outlet Type	I Visib
0	Regular	FDX32	Fruits and Vegetables	2012	OUT049	Tier 1	Medium	Supermarket Type1	0.100
1	Low Fat	NCB42	Health and Hygiene	2022	OUT018	Tier 3	Medium	Supermarket Type2	0.008
2	Regular	FDR28	Frozen Foods	2010	OUT046	Tier 1	Small	Supermarket Type1	0.025
3	Regular	FDL50	Canned	2000	OUT013	Tier 3	High	Supermarket Type1	0.042
4	Low Fat	DRI25	Soft Drinks	2015	OUT045	Tier 2	Small	Supermarket Type1	0.033
5	low fat	FDS52	Frozen Foods	2020	OUT017	Tier 2	Small	Supermarket Type1	0.005
6	Low Fat	NCU05	Health and Hygiene	2011	OUT010	Tier 3	Small	Grocery Store	0.098
7	Low Fat	NCD30	Household	2015	OUT045	Tier 2	Small	Supermarket Type1	0.026
8	Low Fat	FDW20	Fruits and Vegetables	2000	OUT013	Tier 3	High	Supermarket Type1	0.024
9	Low Fat	FDX25	Canned	1998	OUT027	Tier 3	Medium	Supermarket Type3	0.101

In [5]:

```
df.shape
```

Out[5]:

```
(8523, 12)
```

In [6]:

```
df.columns
```

Out[6]:

```
Index(['Item Fat Content', 'Item Identifier', 'Item Type',
       'Outlet Establishment Year', 'Outlet Identifier',
       'Outlet Location Type', 'Outlet Size', 'Outlet Type', 'Item Visibilit
y',
       'Item Weight', 'Sales', 'Rating'],
      dtype='object')
```

In [7]:

```
df.dtypes
```

Out[7]:

```
Item Fat Content              object
Item Identifier               object
Item Type                     object
Outlet Establishment Year      int64
Outlet Identifier             object
Outlet Location Type          object
Outlet Size                   object
Outlet Type                   object
Item Visibility              float64
Item Weight                  float64
Sales                        float64
Rating                       float64
dtype: object
```

In [8]:

```
df['Item Fat Content'].unique()
```

Out[8]:

```
array(['Regular', 'Low Fat', 'low fat', 'LF', 'reg'], dtype=object)
```

In [11]:

```
df['Item Type'].unique()
```

Out[11]:

```
array(['Fruits and Vegetables', 'Health and Hygiene', 'Frozen Foods',
       'Canned', 'Soft Drinks', 'Household', 'Snack Foods', 'Meat',
       'Breads', 'Hard Drinks', 'Others', 'Dairy', 'Breakfast',
       'Baking Goods', 'Seafood', 'Starchy Foods'], dtype=object)
```

In [13]:

```
df['Outlet Location Type'].unique()
```

Out[13]:

```
array(['Tier 1', 'Tier 3', 'Tier 2'], dtype=object)
```

In [14]:

```
df['Outlet Size'].unique()
```

Out[14]:

```
array(['Medium', 'Small', 'High'], dtype=object)
```

In [15]:

```
df['Outlet Type'].unique()
```

Out[15]:

```
array(['Supermarket Type1', 'Supermarket Type2', 'Grocery Store',
       'Supermarket Type3'], dtype=object)
```

Data Cleaning

```
In [38]: df['Item Fat Content'] = df['Item Fat Content'].replace({'low fat': 'Low Fat',
                                        'LF':'Low Fat',
                                        'reg':'Regular'})
```

```
In [39]: df['Item Fat Content'].unique()
```

```
Out[39]: array(['Regular', 'Low Fat'], dtype=object)
```

```
In [70]: df.columns = df.columns.str.strip()
```

```
In [17]: print(df.isnull().sum())
```

```
Item Fat Content                0
Item Identifier                 0
Item Type                       0
Outlet Establishment Year       0
Outlet Identifier               0
Outlet Location Type            0
Outlet Size                     0
Outlet Type                     0
Item Visibility                 0
Item Weight                  1463
Sales                           0
Rating                          0
dtype: int64
```

```
In [19]: df['Item Weight'] = df.groupby('Item Type')['Item Weight'].transform(
             lambda x: x.fillna(x.mean()))
```

```
In [20]: print(df.isnull().sum())
```

```
Item Fat Content             0
Item Identifier              0
Item Type                    0
Outlet Establishment Year    0
Outlet Identifier            0
Outlet Location Type         0
Outlet Size                  0
Outlet Type                  0
Item Visibility              0
Item Weight                  0
Sales                        0
Rating                       0
dtype: int64
```

Check Outliers

In [10]:

```
Q1 = df['Sales'].quantile(0.25)
Q3 = df['Sales'].quantile(0.75)
IQR = Q3 - Q1

# Define bounds
lower_bound = Q1 - 1.5 * IQR
upper_bound = Q3 + 1.5 * IQR

# Find outliers
sales_outliers = df[(df['Sales'] < lower_bound) | (df['Sales'] > upper_bound)]

# Output results
print(f"Total outliers in 'Sales': {len(sales_outliers)}")
print(sales_outliers[['Sales']])
```

```
Total outliers in 'Sales': 0
Empty DataFrame
Columns: [Sales]
Index: []
```

Business Requirements

In [17]:

```
# Total Sales
Total_sales = df['Sales'].sum()

# Avg Sales
Avg_sales = df['Sales'].mean()

# No of item sold
No_of_items_sold = df['Sales'].count()

# Avg Ratings
Avg_ratings = df['Rating'].mean()
```

In [21]:

```
print(f"Total Sales : ${Total_sales :,.0f} ")
print(f"Avg Sales : ${Avg_sales :,.0f} ")
print(f"No of items sold : {No_of_items_sold :,.0f} ")
print(f"Avg Ratings : {Avg_ratings :,.1f} ")
```

```
Total Sales : $1,201,681
Avg Sales : $141
No of items sold : 8,523
Avg Ratings : 4.0
```

In [43]:

```
df['Outlet Identifier'].unique()
```

Out[43]:

```
array(['OUT049', 'OUT018', 'OUT046', 'OUT013', 'OUT045', 'OUT017',
       'OUT010', 'OUT027', 'OUT035', 'OUT019'], dtype=object)
```

Total Sales by Outlets

```
In [54]: Sales_by_outlet = df.groupby('Outlet Identifier')['Sales'].sum().round(2)
```

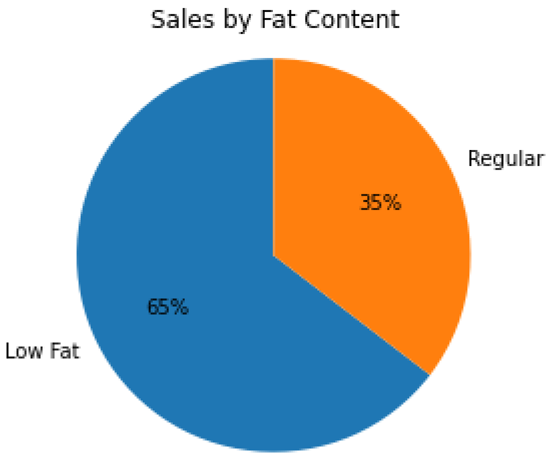
```
In [55]: Sales_by_outlet
```

```
Out[55]: Outlet Identifier
         OUT010     78131.56
         OUT013    131809.02
         OUT017    129103.96
         OUT018    131477.77
         OUT019     73807.58
         OUT027    130714.67
         OUT035    133103.91
         OUT045    130942.78
         OUT046    132113.37
         OUT049    130476.86
         Name: Sales, dtype: float64
```

Total Sales by Fat Content

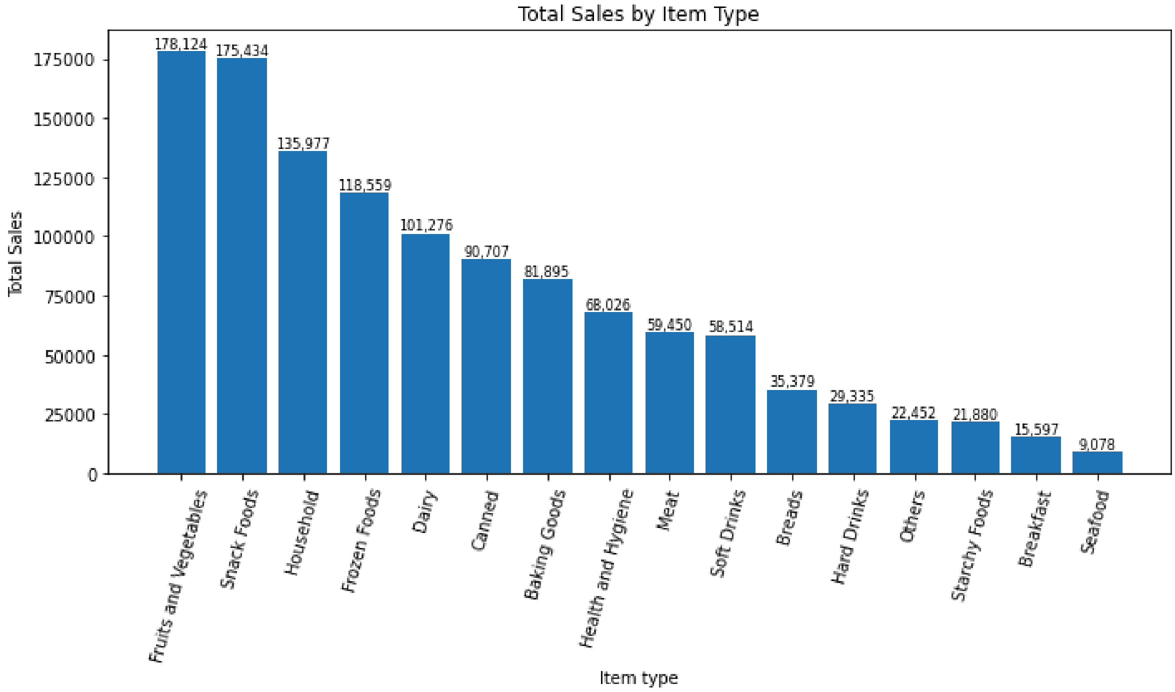
```
In [26]: Sales_by_fat = df.groupby('Item Fat Content')['Sales'].sum()

         plt.pie(Sales_by_fat, labels = Sales_by_fat.index,
                                autopct = '%.0f%%',
                                startangle = 90)
         plt.title('Sales by Fat Content')
         plt.axis('equal')
         plt.show
```

```
Out[26]: <function matplotlib.pyplot.show(close=None, block=None)>
```



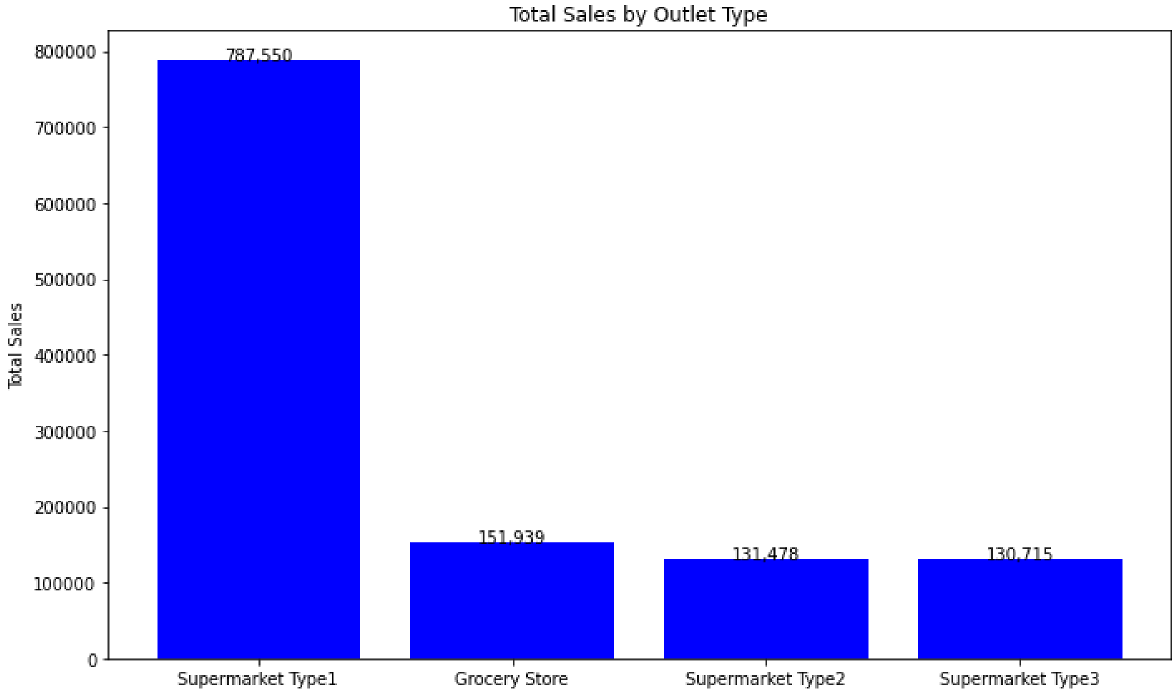
Total Sales by Item Type

```
In [29]: sales_by_type = df.groupby('Item Type')['Sales'].sum().sort_values(ascending =

         # Create bar chart
         plt.figure(figsize=(10, 6))
         bars = plt.bar(sales_by_type.index, sales_by_type.values)

         plt.xticks(rotation = 75)
         plt.xlabel('Item type')
         plt.ylabel('Total Sales')
         plt.title('Total Sales by Item Type')

         # Add labels on top of each bar
         for bar in bars:
             plt.text(bar.get_x() + bar.get_width()/2, bar.get_height(),  # Position
                      f'{bar.get_height():,.0f}', ha='center', va='bottom', fontsize =

         plt.tight_layout()
         plt.show()
```



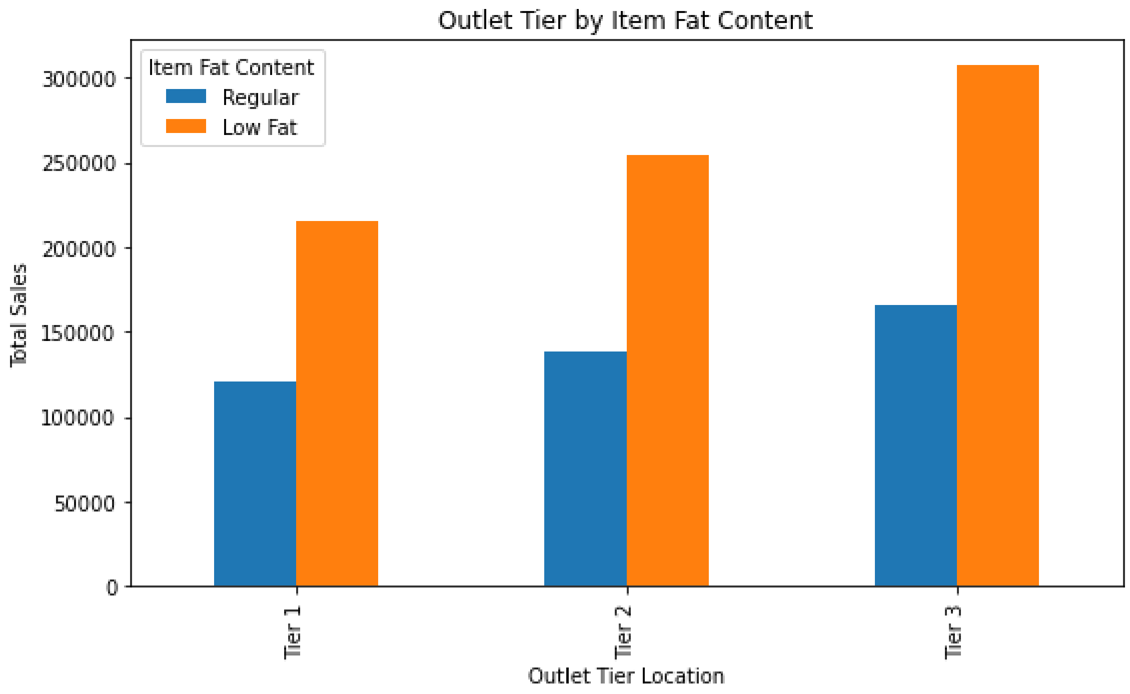
Total Sales by Outlet Type

In [27]:
```
sales_by_outlet = df.groupby('Outlet Type')['Sales'].sum().sort_values(ascendi

plt.figure(figsize=(10,6))
bars = plt.bar(sales_by_outlet.index, sales_by_outlet.values, color='blue')

# Add labels on top of bars
for bar in bars:

    plt.text(bar.get_x() + bar.get_width()/2,bar.get_height() , f'{bar.get_hei

plt.title('Total Sales by Outlet Type')
plt.ylabel('Total Sales')
plt.xticks(rotation=0)
plt.tight_layout()
plt.show()
```



Total Sales by Fat content and Outlet Location Type

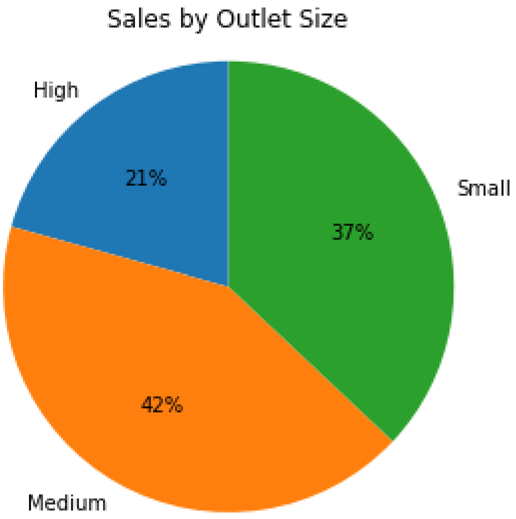
```
In [31]: grouped = df.groupby(['Outlet Location Type','Item Fat Content'])['Sales'].sum
         grouped = grouped[['Regular','Low Fat']]
         ax = grouped.plot(kind = 'bar',figsize = (8,5), title = 'Outlet Tier by Item F
         plt.xlabel('Outlet Tier Location')
         plt.ylabel('Total Sales')
         plt.legend(title = 'Item Fat Content')
         plt.tight_layout()
         plt.show()
```



Total Sales by Outlet Size

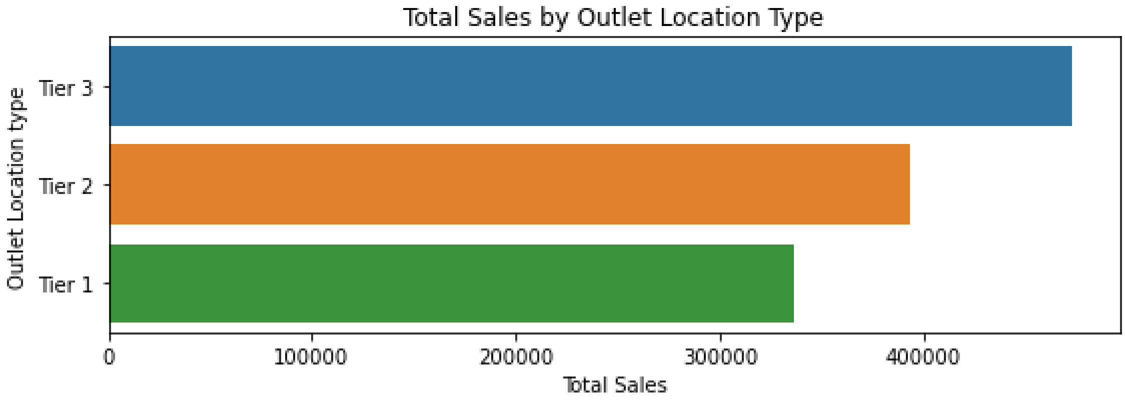
```
In [32]: sales_by_size = df.groupby('Outlet Size')['Sales'].sum()

         plt.pie(sales_by_size, labels = sales_by_size.index,
                                autopct = '%.0f%%',
                                startangle = 90)
         plt.title('Sales by Outlet Size')
         plt.axis('equal')
         plt.tight_layout()
         plt.show
```

```
Out[32]: <function matplotlib.pyplot.show(close=None, block=None)>
```



Total Sales by Outlet Location

```
In [33]: sales_by_location = df.groupby('Outlet Location Type')['Sales'].sum().reset_ir
         sales_by_location = sales_by_location.sort_values('Sales', ascending = False)
         plt.figure(figsize = (8,3))
         ax = sns.barplot(x = 'Sales', y = 'Outlet Location Type', data = sales_by_loca

         plt.title('Total Sales by Outlet Location Type')
         plt.xlabel('Total Sales')
         plt.ylabel('Outlet Location type')
         plt.tight_layout()
         plt.show()
```



Average Rating by Item Type

In [56]:

```
avg_rating_by_item = df.groupby('Item Type')['Rating'].mean().round(2).sort_va
print(avg_rating_by_item)
```

```
Item Type
Meat                     4.02
Household                4.00
Canned                   3.99
Health and Hygiene       3.99
Baking Goods             3.98
Dairy                    3.97
Frozen Foods             3.97
Fruits and Vegetables    3.96
Seafood                  3.96
Others                   3.95
Snack Foods              3.95
Breakfast                3.93
Soft Drinks              3.92
Starchy Foods            3.92
Hard Drinks              3.91
Breads                   3.88
Name: Rating, dtype: float64
```

Which outlet has max sales?

In [52]:

```
sales_by_outlet = df.groupby('Outlet Identifier')['Sales'].sum()

max_outlet = sales_by_outlet.idxmax()
max_sales = sales_by_outlet.max()


print(f"Outlet with max total sales: {max_outlet}")
print(f"Total Sales: ${max_sales:,.1f}")
```

```
Outlet with max total sales: OUT035
Total Sales: $133,103.9
```

Is there any Relationship b/w Item Visibility and Sales?

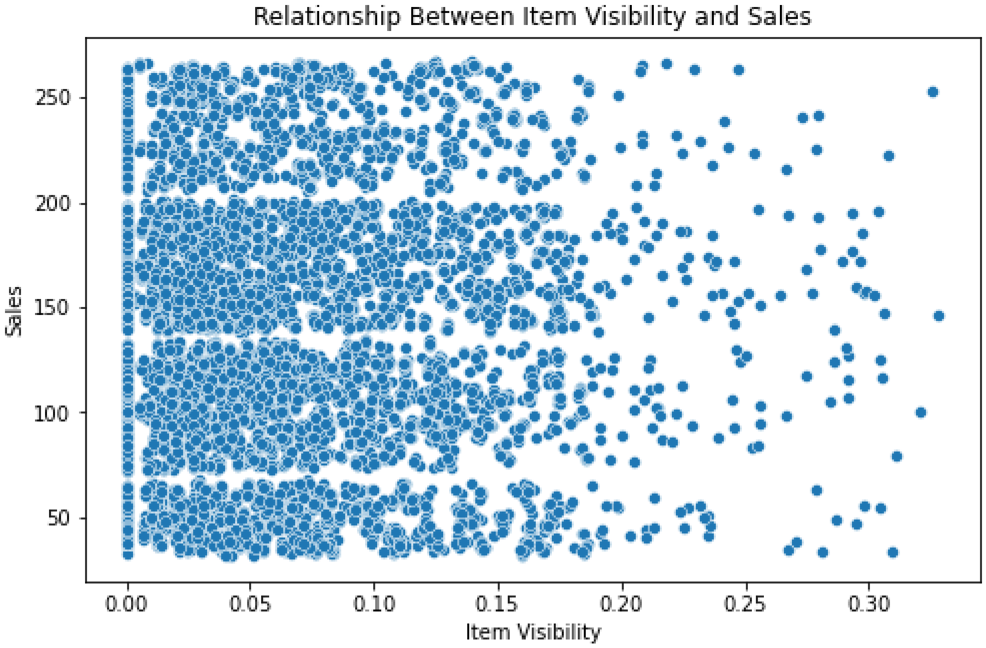
In [61]:

```
correlation = df['Item Visibility'].corr(df['Sales'])
print("Correlation between Item Visibility and Sales:", correlation)
```

```
Correlation between Item Visibility and Sales: -0.0013148480362671707
```

In [60]:

```
plt.figure(figsize=(8, 5))
sns.scatterplot(data=df, x='Item Visibility', y='Sales')
plt.title('Relationship Between Item Visibility and Sales')
plt.xlabel('Item Visibility')
plt.ylabel('Sales')
plt.show()
```

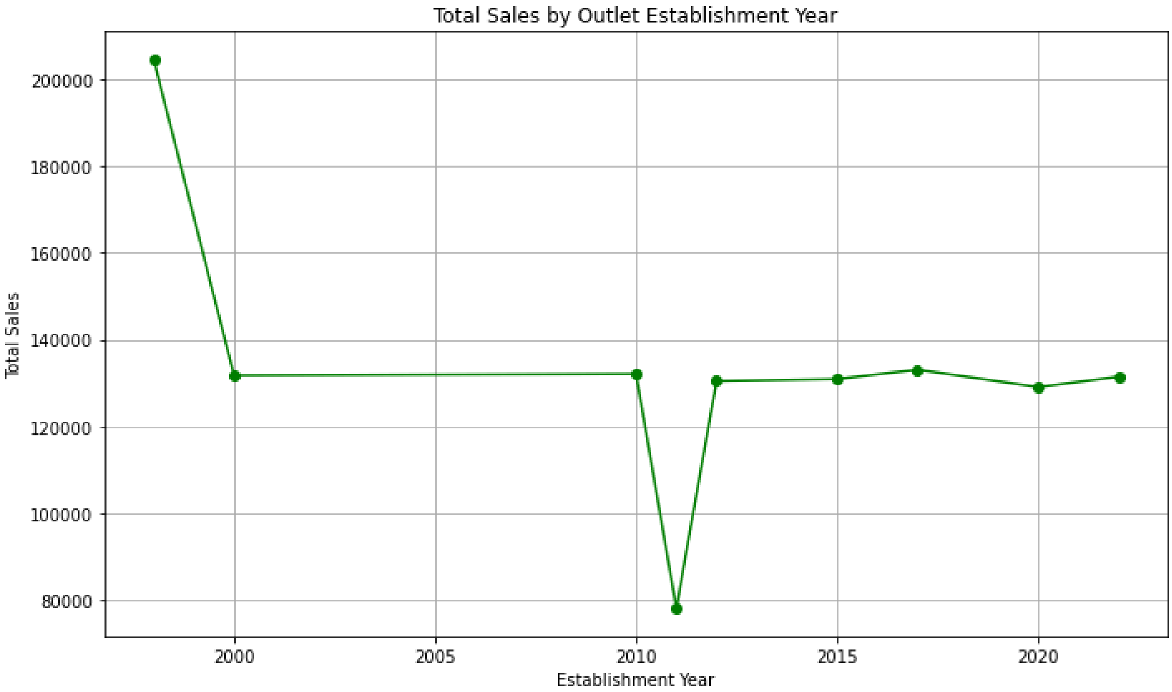


This scatter plot clearly shows that Item Visibility does not significantly affect Sales as well as Correlation is also close to 0.

Total Sales by Outlet establishment Year

In [75]:

```
sales_by_year = df.groupby('Outlet Establishment Year')['Sales'].sum().reset_i

plt.figure(figsize=(10,6))
plt.plot(sales_by_year['Outlet Establishment Year'], sales_by_year['Sales'], m
plt.title('Total Sales by Outlet Establishment Year')
plt.xlabel('Establishment Year')
plt.ylabel('Total Sales')
plt.grid(True)
plt.tight_layout()
plt.show()
```



In [ ]:

In [ ]: