In [1]:
```
import pandas as pd
```

In [23]:
```
import pandas as pd

# Use 'latin1' or 'ISO-8859-1' to fix encoding error
df = pd.read_csv(r"C:\Users\sunny\SampleSuperstore.csv", encoding='latin1')
df.head()
```

Out[23]:

	Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	Co
0	1	CA-2016-152156	11/8/2016	11/11/2016	Second Class	CG-12520	Claire Gute	Consumer	U
1	2	CA-2016-152156	11/8/2016	11/11/2016	Second Class	CG-12520	Claire Gute	Consumer	U
2	3	CA-2016-138688	6/12/2016	6/16/2016	Second Class	DV-13045	Darrin Van Huff	Corporate	U
3	4	US-2015-108966	10/11/2015	10/18/2015	Standard Class	SO-20335	Sean O'Donnell	Consumer	U
4	5	US-2015-108966	10/11/2015	10/18/2015	Standard Class	SO-20335	Sean O'Donnell	Consumer	U

5 rows × 21 columns

In [25]:
```
print(df.info())
print(df.describe())
print(df.isnull().sum())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9994 entries, 0 to 9993
Data columns (total 21 columns):
 #   Column         Non-Null Count  Dtype  
---  ------         --------------  -----  
 0   Row ID         9994 non-null   int64  
 1   Order ID       9994 non-null   object 
 2   Order Date     9994 non-null   object 
 3   Ship Date      9994 non-null   object 
 4   Ship Mode      9994 non-null   object 
 5   Customer ID    9994 non-null   object 
 6   Customer Name  9994 non-null   object 
 7   Segment        9994 non-null   object 
 8   Country        9994 non-null   object 
 9   City           9994 non-null   object 
 10  State          9994 non-null   object 
 11  Postal Code    9994 non-null   int64  
 12  Region         9994 non-null   object 
 13  Product ID     9994 non-null   object 
 14  Category       9994 non-null   object 
 15  Sub-Category   9994 non-null   object 
 16  Product Name   9994 non-null   object 
 17  Sales          9994 non-null   float64
 18  Quantity       9994 non-null   int64  
 19  Discount       9994 non-null   float64
 20  Profit         9994 non-null   float64
dtypes: float64(3), int64(3), object(15)
memory usage: 1.6+ MB
None
            Row ID   Postal Code         Sales     Quantity     Discount  \
count  9994.000000   9994.000000   9994.000000  9994.000000  9994.000000   
mean   4997.500000  55190.379428    229.858001     3.789574     0.156203   
std    2885.163629  32063.693350    623.245101     2.225110     0.206452   
min       1.000000   1040.000000      0.444000     1.000000     0.000000   
25%    2499.250000  23223.000000     17.280000     2.000000     0.000000   
50%    4997.500000  56430.500000     54.490000     3.000000     0.200000   
75%    7495.750000  90008.000000    209.940000     5.000000     0.200000   
max    9994.000000  99301.000000  22638.480000    14.000000     0.800000   

              Profit  
count  9994.000000  
mean     28.656896  
std     234.260108  
min   -6599.978000  
25%       1.728750  
50%       8.666500  
75%      29.364000  
max    8399.976000  
Row ID           0
Order ID         0
Order Date       0
Ship Date        0
Ship Mode        0
Customer ID      0
Customer Name    0
Segment          0
Country          0
City             0
State            0
Postal Code      0
```

```
Region          0
Product ID      0
Category        0
Sub-Category    0
Product Name    0
Sales           0
Quantity        0
Discount        0
Profit          0
dtype: int64
```

In [27]:
```
df = df.drop_duplicates()
```

In [29]:
```
df
```

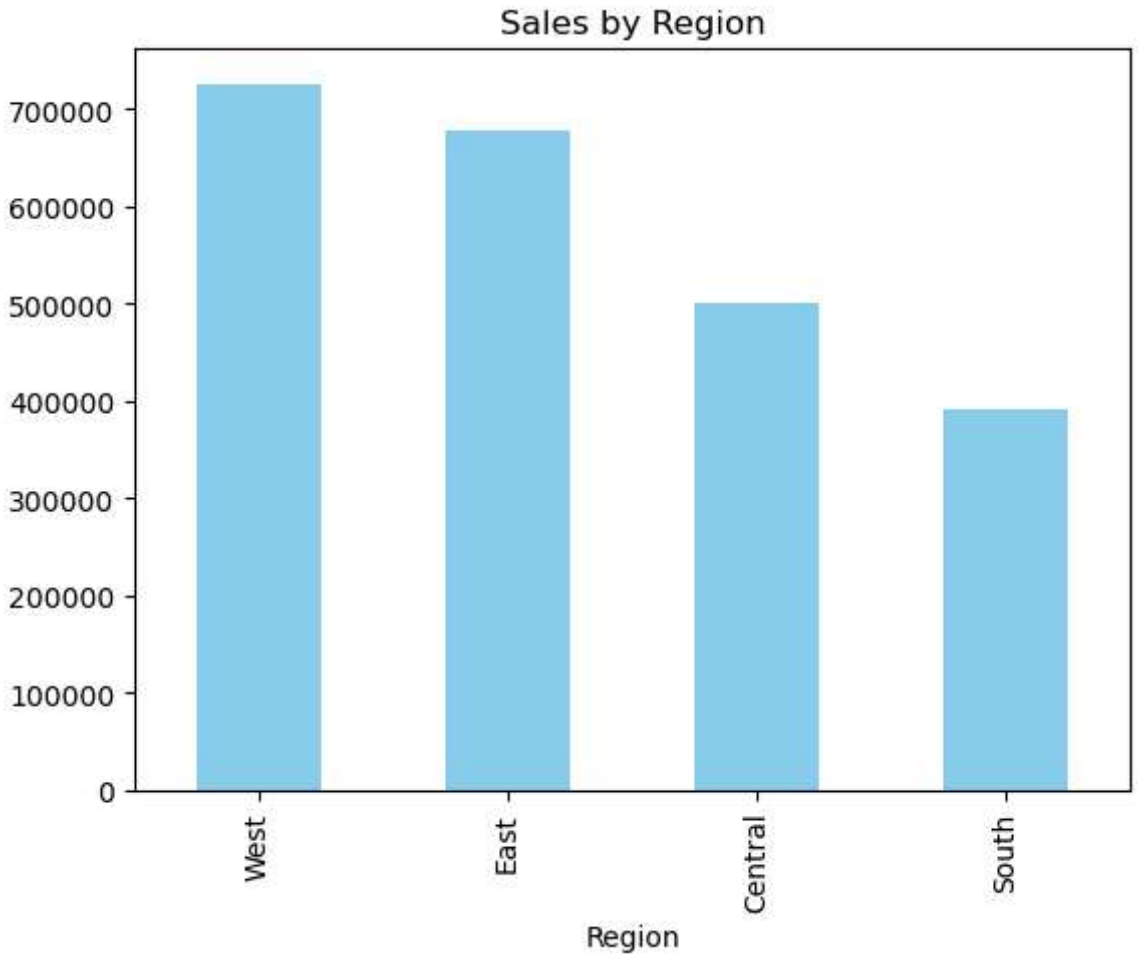
Out[29]:

	Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segme
0	1	CA-2016-152156	11/8/2016	11/11/2016	Second Class	CG-12520	Claire Gute	Consun
1	2	CA-2016-152156	11/8/2016	11/11/2016	Second Class	CG-12520	Claire Gute	Consun
2	3	CA-2016-138688	6/12/2016	6/16/2016	Second Class	DV-13045	Darrin Van Huff	Corpor
3	4	US-2015-108966	10/11/2015	10/18/2015	Standard Class	SO-20335	Sean O'Donnell	Consun
4	5	US-2015-108966	10/11/2015	10/18/2015	Standard Class	SO-20335	Sean O'Donnell	Consun
...	...	...	...	...	...	...	...	
9989	9990	CA-2014-110422	1/21/2014	1/23/2014	Second Class	TB-21400	Tom Boeckenhauer	Consun
9990	9991	CA-2017-121258	2/26/2017	3/3/2017	Standard Class	DB-13060	Dave Brooks	Consun
9991	9992	CA-2017-121258	2/26/2017	3/3/2017	Standard Class	DB-13060	Dave Brooks	Consun
9992	9993	CA-2017-121258	2/26/2017	3/3/2017	Standard Class	DB-13060	Dave Brooks	Consun
9993	9994	CA-2017-119914	5/4/2017	5/9/2017	Second Class	CC-12220	Chris Cortes	Consun

9994 rows × 21 columns

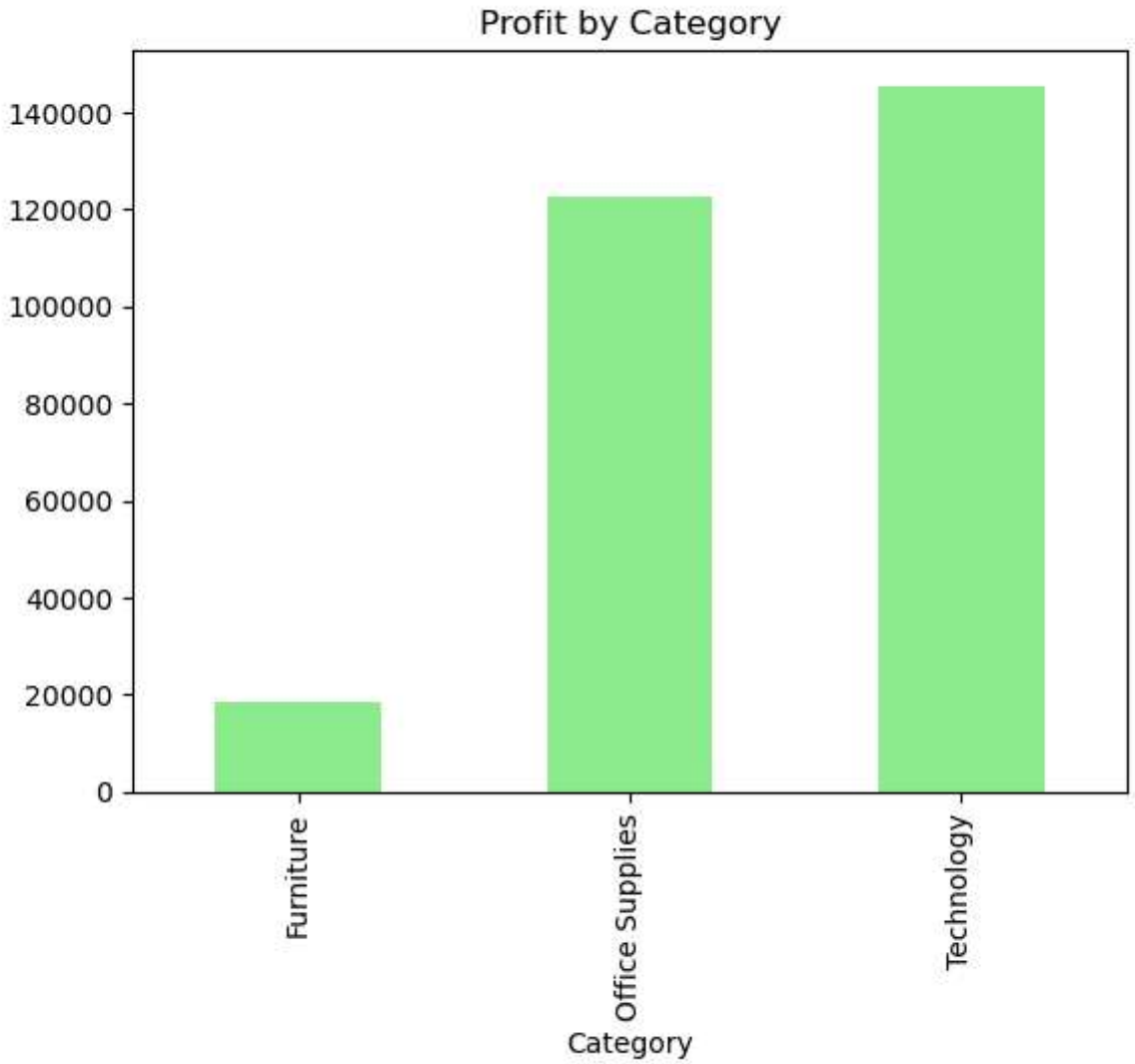
In [31]:
```
region_sales = df.groupby('Region')['Sales'].sum().sort_values(ascending=False)
region_sales.plot(kind='bar', title='Sales by Region', color='skyblue')
```

Out[31]: <Axes: title={'center': 'Sales by Region'}, xlabel='Region'>



In [33]:
```
category_profit = df.groupby('Category')['Profit'].sum()
category_profit.plot(kind='bar', title='Profit by Category', color='lightgreen')
```

Out[33]: <Axes: title={'center': 'Profit by Category'}, xlabel='Category'>



In [37]:
```
import seaborn as sns
import matplotlib.pyplot as plt

# ✅ Select only numerical columns for correlation
numeric_df = df.select_dtypes(include=['number'])

plt.figure(figsize=(8,5))
sns.heatmap(numeric_df.corr(), annot=True, cmap='coolwarm')
plt.title("Correlation Heatmap")
plt.tight_layout()
plt.savefig("correlation_heatmap.png")
plt.show()
```


Correlation Heatmap
Row ID
Postal Code
Sales
Quantity
Discount
Profit
1
0.0097
-0.0014
-0.004
0.013
0.012
0.0097
1
-0.024
0.013
0.058
-0.03
-0.0014
-0.024
1
0.2
-0.028
0.48
-0.004
0.013
0.2
1
0.0086
0.066
0.013
0.058
-0.028
0.0086
1
-0.22
0.012
-0.03
0.48
0.066
-0.22
1
Row ID
Postal Code
Sales
Quantity
Discount
Profit
1.0
0.8
0.6
0.4
0.2
0.0
−0.2

In [ ]: