internship-task-3

May 7, 2022

1 internship-task-3

Use the "Run" button to execute the code.

[44]:
```
!pip install jovian --upgrade --quiet
```

[45]:
```
import jovian
```

[ ]:
```
# Execute this to save new versions of the notebook
jovian.commit(project="internship-task-3")
```

```
<IPython.core.display.Javascript object>
```

[2]:
```
df = pd.read_csv('SampleSuperstore (2).csv')
```

[3]:
```
df
```

[3]:

	Ship Mode	Segment	Country	City	State	Postal Code	Region	Category	Sub-Category	Sales	Quantity
0	Second Class	Consumer	United States	Henderson	Kentucky	42420	South	Furniture	Bookcases	261.9600	2
1	Second Class	Consumer	United States	Henderson	Kentucky	42420	South	Furniture	Chairs	731.9400	3
2	Second Class	Corporate	United States	Los Angeles	California	90036	West	Office Supplies	Labels	14.6200	2
3	Standard Class	Consumer	United States	Fort Lauderdale	Florida	33311	South	Furniture	Tables	957.5775	5
4	Standard Class	Consumer	United States	Fort Lauderdale	Florida	33311	South	Office Supplies	Storage	22.3680	2
…	…	…	…	…	…	…	…	…	…	…	…
9989	Second Class	Consumer	United States	Miami	Florida	33180	South	Furniture	Furnishings	25.2480	3
9990	Standard Class	Consumer	United States	Costa Mesa	California						
9991	Standard Class	Consumer	United States	Costa Mesa	California						
9992	Standard Class	Consumer	United States	Costa Mesa	California						
9993	Second Class	Consumer	United States	Westminster	California						

```
9990        92627   West        Furniture  Furnishings   91.9600         2
9991        92627   West       Technology       Phones  258.5760         2
9992        92627   West  Office Supplies        Paper   29.6000         4
9993        92683   West  Office Supplies   Appliances  243.1600         2

      Discount    Profit
0         0.00   41.9136
1         0.00  219.5820
2         0.00    6.8714
3         0.45 -383.0310
4         0.20    2.5164
…          …       …
9989      0.20    4.1028
9990      0.00   15.6332
9991      0.20   19.3932
9992      0.00   13.3200
9993      0.00   72.9480

[9994 rows x 13 columns]
```

[4]:
```
df.columns
```

[4]:
```
Index(['Ship Mode', 'Segment', 'Country', 'City', 'State', 'Postal Code',
       'Region', 'Category', 'Sub-Category', 'Sales', 'Quantity', 'Discount',
       'Profit'],
      dtype='object')
```

[5]:
```
df.rename(columns={'Sub-Category': 'SubCategory'},inplace=True)
```

Understandind Data: 1. This is a data of a company supplying goods of category three categories: furniture,office appliances and technology. 2. Goods are supplied in various states of UNITED STATES and to different region of each state.

Objective of the study: We need to analyze what categories sold in which particular region is profitable and what can be done to improve profits.

[6]:
```
selected_columns = ['State','City','Region','Category','SubCategory','Profit']
```

[7]:
```
len(selected_columns)
```

[7]:
```
6
```

[8]:
```
filter_df = df[selected_columns].copy()
```

[9]:
```
filter_df
```

[9]:
```
           State             City Region         Category  SubCategory  \
0       Kentucky        Henderson  South        Furniture    Bookcases
```

```
1       Kentucky        Henderson  South        Furniture       Chairs
2     California      Los Angeles   West  Office Supplies       Labels
3        Florida  Fort Lauderdale  South        Furniture       Tables
4        Florida  Fort Lauderdale  South  Office Supplies      Storage
…          …              …    …              …           …
9989     Florida            Miami  South        Furniture  Furnishings
9990  California       Costa Mesa   West        Furniture  Furnishings
9991  California       Costa Mesa   West       Technology       Phones
9992  California       Costa Mesa   West  Office Supplies        Paper
9993  California      Westminster   West  Office Supplies   Appliances

        Profit
0      41.9136
1     219.5820
2       6.8714
3    -383.0310
4       2.5164
…         …
9989    4.1028
9990   15.6332
9991   19.3932
9992   13.3200
9993   72.9480

[9994 rows x 6 columns]
```

[10]:
```
filter_df.shape
```

[10]:
```
(9994, 6)
```

[11]:
```
filter_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9994 entries, 0 to 9993
Data columns (total 6 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   State        9994 non-null   object
 1   City         9994 non-null   object
 2   Region       9994 non-null   object
 3   Category     9994 non-null   object
 4   SubCategory  9994 non-null   object
 5   Profit       9994 non-null   float64
dtypes: float64(1), object(5)
memory usage: 468.6+ KB
```

[12]:
```
filter_df.describe()
```

[12]:
```
             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
```

[13]:
```
import seaborn as sns
import matplotlib
import matplotlib.pyplot as plt
%matplotlib inline

sns.set_style('darkgrid')
matplotlib.rcParams['font.size'] = 14
matplotlib.rcParams['figure.figsize'] = (9,5)
matplotlib.rcParams['figure.facecolor'] = '#00000000'
```

[14]:
```
filter_df.State.nunique()
```

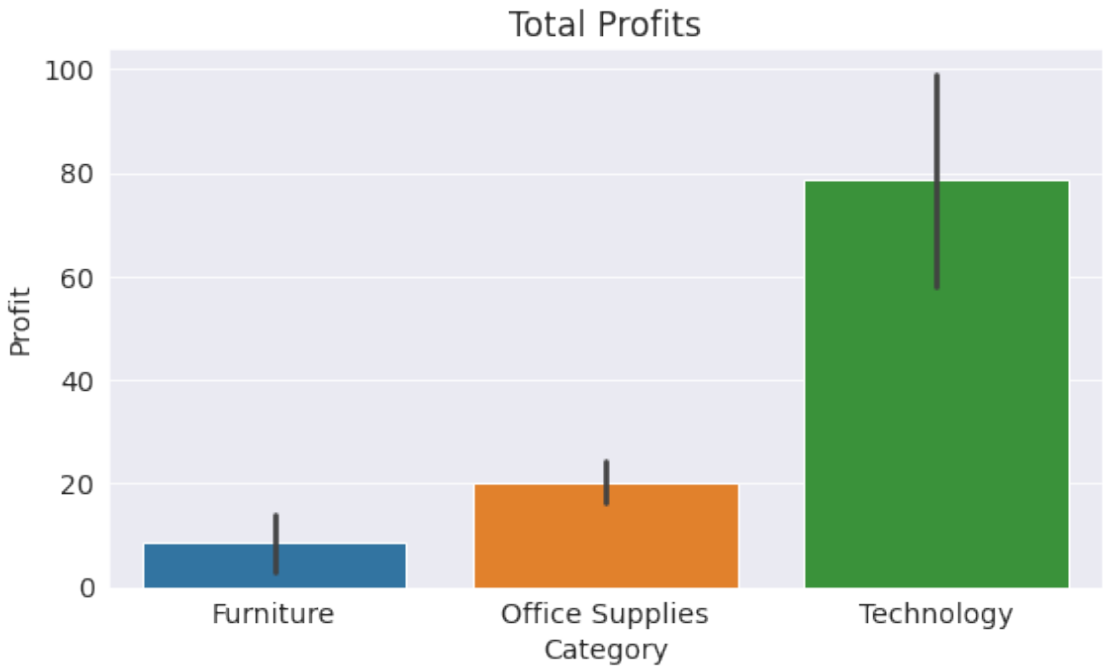
[14]:
```
49
```

[15]:
```
import numpy as np
Profit = 'Total Profits'
```

Total Profits in all regions for all three Categories.

[16]:
```
sns.barplot(df.Category,df.Profit)
plt.title(Profit)
plt.xlabel('Category')
plt.ylabel('Profit');
```

```
/opt/conda/lib/python3.9/site-packages/seaborn/_decorators.py:36: FutureWarning:
Pass the following variables as keyword args: x, y. From version 0.12, the only
valid positional argument will be `data`, and passing other arguments without an
explicit keyword will result in an error or misinterpretation.
  warnings.warn(
```



Filtered data : filtered category column to show only furniture data.

[17]:
```
df_furniture = df.loc[df['Category'] == 'Furniture']
df_furniture
```

[17]:

	Ship Mode	Segment	Country	City	State	\
0	Second Class	Consumer	United States	Henderson	Kentucky	
1	Second Class	Consumer	United States	Henderson	Kentucky	
3	Standard Class	Consumer	United States	Fort Lauderdale	Florida	
5	Standard Class	Consumer	United States	Los Angeles	California	
10	Standard Class	Consumer	United States	Los Angeles	California	
…	…	…	…	…	…	
9962	First Class	Home Office	United States	Houston	Texas	
9964	Second Class	Corporate	United States	Newark	Delaware	
9980	Second Class	Consumer	United States	Lafayette	Louisiana	
9989	Second Class	Consumer	United States	Miami	Florida	
9990	Standard Class	Consumer	United States	Costa Mesa	California	

	Postal Code	Region	Category	SubCategory	Sales	Quantity	\
0	42420	South	Furniture	Bookcases	261.9600	2	
1	42420	South	Furniture	Chairs	731.9400	3	
3	33311	South	Furniture	Tables	957.5775	5	
5	90032	West	Furniture	Furnishings	48.8600	7	
10	90032	West	Furniture	Tables	1706.1840	9	
…	…	…	…	…	…	…	

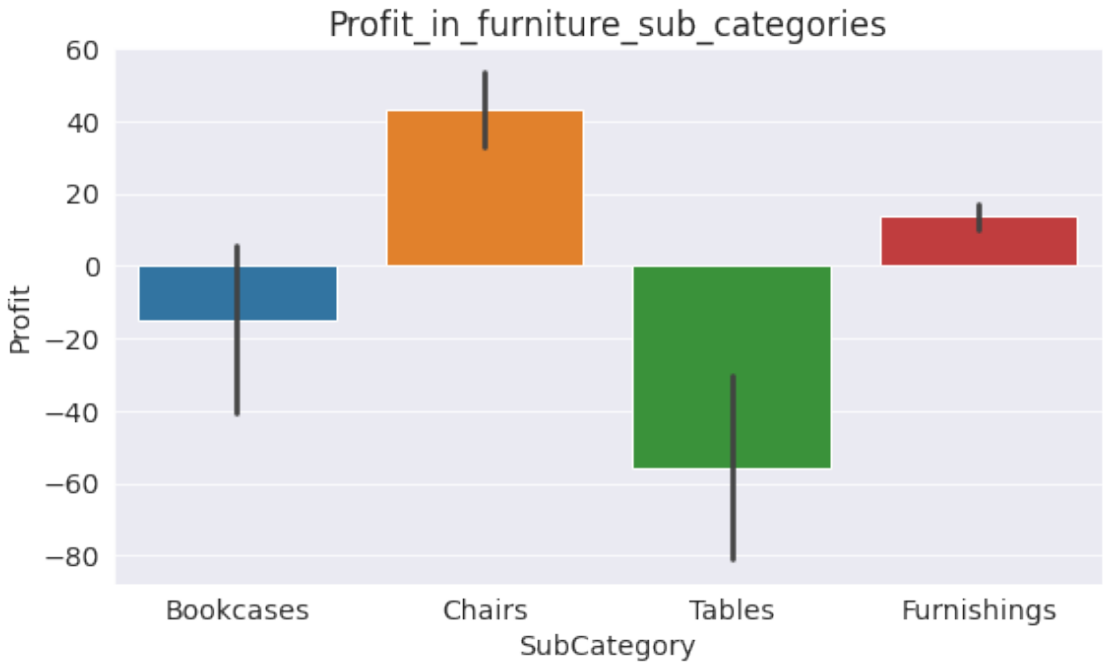
```
9962        77041  Central  Furniture    Bookcases   383.4656         4
9964        19711     East  Furniture  Furnishings    13.4000         1
9980        70506    South  Furniture       Tables    85.9800         1
9989        33180    South  Furniture  Furnishings    25.2480         3
9990        92627     West  Furniture  Furnishings    91.9600         2

      Discount    Profit
0         0.00   41.9136
1         0.00  219.5820
3         0.45 -383.0310
5         0.00   14.1694
10        0.20   85.3092
…          …       …
9962      0.32  -67.6704
9964      0.00    6.4320
9980      0.00   22.3548
9989      0.20    4.1028
9990      0.00   15.6332

[2121 rows x 13 columns]
```

Plot showing total profit in all furniture subcategories.

[18]:
```
Furniture='Profit_in_furniture_sub_categories'
sns.barplot(df_furniture.SubCategory,df_furniture.Profit)
plt.xlabel('SubCategory')
plt.ylabel('Profit')
plt.title(Furniture)
```

```
/opt/conda/lib/python3.9/site-packages/seaborn/_decorators.py:36: FutureWarning:
Pass the following variables as keyword args: x, y. From version 0.12, the only
valid positional argument will be `data`, and passing other arguments without an
explicit keyword will result in an error or misinterpretation.
  warnings.warn(
```

[18]:
```
Text(0.5, 1.0, 'Profit_in_furniture_sub_categories')
```



Filtered data: filtered category column to show only office supplies.

[19]:
```
df_OfficeSupplies = df.loc[df['Category'] == 'Office Supplies']
df_OfficeSupplies
```

[19]:

	Ship Mode	Segment	Country	City	State	\
2	Second Class	Corporate	United States	Los Angeles	California	
4	Standard Class	Consumer	United States	Fort Lauderdale	Florida	
6	Standard Class	Consumer	United States	Los Angeles	California	
8	Standard Class	Consumer	United States	Los Angeles	California	
9	Standard Class	Consumer	United States	Los Angeles	California	
…	…	…	…	…	…	
9982	Standard Class	Consumer	United States	Grand Rapids	Michigan	
9984	Standard Class	Consumer	United States	Long Beach	New York	
9985	Standard Class	Consumer	United States	Long Beach	New York	
9992	Standard Class	Consumer	United States	Costa Mesa	California	
9993	Second Class	Consumer	United States	Westminster	California	

	Postal Code	Region	Category	SubCategory	Sales	Quantity	\
2	90036	West	Office Supplies	Labels	14.620	2	
4	33311	South	Office Supplies	Storage	22.368	2	
6	90032	West	Office Supplies	Art	7.280	4	
8	90032	West	Office Supplies	Binders	18.504	3	
9	90032	West	Office Supplies	Appliances	114.900	5	
…	…	…	…	…	…	…	

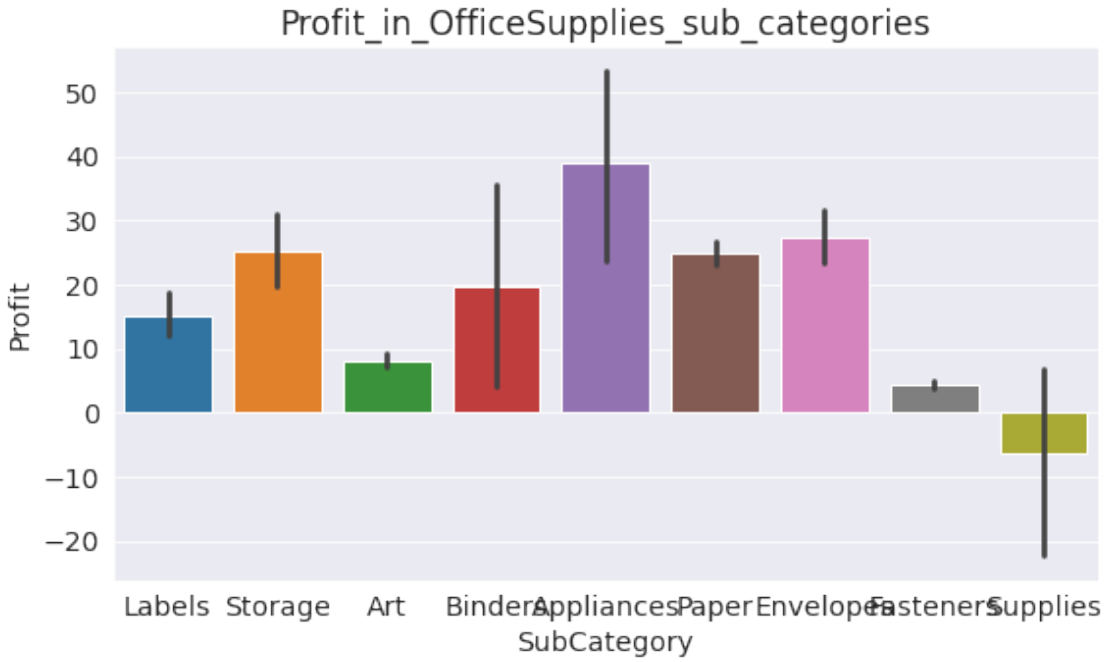
```
9982        49505  Central  Office Supplies       Paper   35.560         7
9984        11561     East  Office Supplies      Labels   31.500        10
9985        11561     East  Office Supplies    Supplies   55.600         4
9992        92627     West  Office Supplies       Paper   29.600         4
9993        92683     West  Office Supplies  Appliances  243.160         2

      Discount   Profit
2          0.0   6.8714
4          0.2   2.5164
6          0.0   1.9656
8          0.2   5.7825
9          0.0  34.4700
…          …       …
9982       0.0  16.7132
9984       0.0  15.1200
9985       0.0  16.1240
9992       0.0  13.3200
9993       0.0  72.9480

[6026 rows x 13 columns]
```

Plot showing total profits in office supplies sub categories.

[20]:
```
OfficeSupplies='Profit_in_OfficeSupplies_sub_categories'
sns.barplot(df_OfficeSupplies.SubCategory,df_OfficeSupplies.Profit)
plt.xlabel('SubCategory')
plt.ylabel('Profit')
plt.title(OfficeSupplies)
```

```
/opt/conda/lib/python3.9/site-packages/seaborn/_decorators.py:36: FutureWarning:
Pass the following variables as keyword args: x, y. From version 0.12, the only
valid positional argument will be `data`, and passing other arguments without an
explicit keyword will result in an error or misinterpretation.
  warnings.warn(
```

[20]:
```
Text(0.5, 1.0, 'Profit_in_OfficeSupplies_sub_categories')
```



Filtered data: filtered category column to show only technology.

[21]:
```
df_Technology= df.loc[df['Category'] == 'Technology']
df_Technology
```

[21]:

	Ship Mode	Segment	Country	City	State	\
7	Standard Class	Consumer	United States	Los Angeles	California	
11	Standard Class	Consumer	United States	Los Angeles	California	
19	Second Class	Consumer	United States	San Francisco	California	
26	Second Class	Consumer	United States	Los Angeles	California	
35	First Class	Corporate	United States	Richardson	Texas	
…	…	…	…	…	…	
9983	Standard Class	Consumer	United States	Grand Rapids	Michigan	
9986	Standard Class	Consumer	United States	Los Angeles	California	
9987	Standard Class	Corporate	United States	Athens	Georgia	
9988	Standard Class	Corporate	United States	Athens	Georgia	
9991	Standard Class	Consumer	United States	Costa Mesa	California	

	Postal Code	Region	Category	SubCategory	Sales	Quantity	\
7	90032	West	Technology	Phones	907.152	6	
11	90032	West	Technology	Phones	911.424	4	
19	94109	West	Technology	Phones	213.480	3	
26	90049	West	Technology	Accessories	90.570	3	
35	75080	Central	Technology	Phones	1097.544	7	
…	…	…	…	…	…	…	
9983	49505	Central	Technology	Phones	97.980	2	

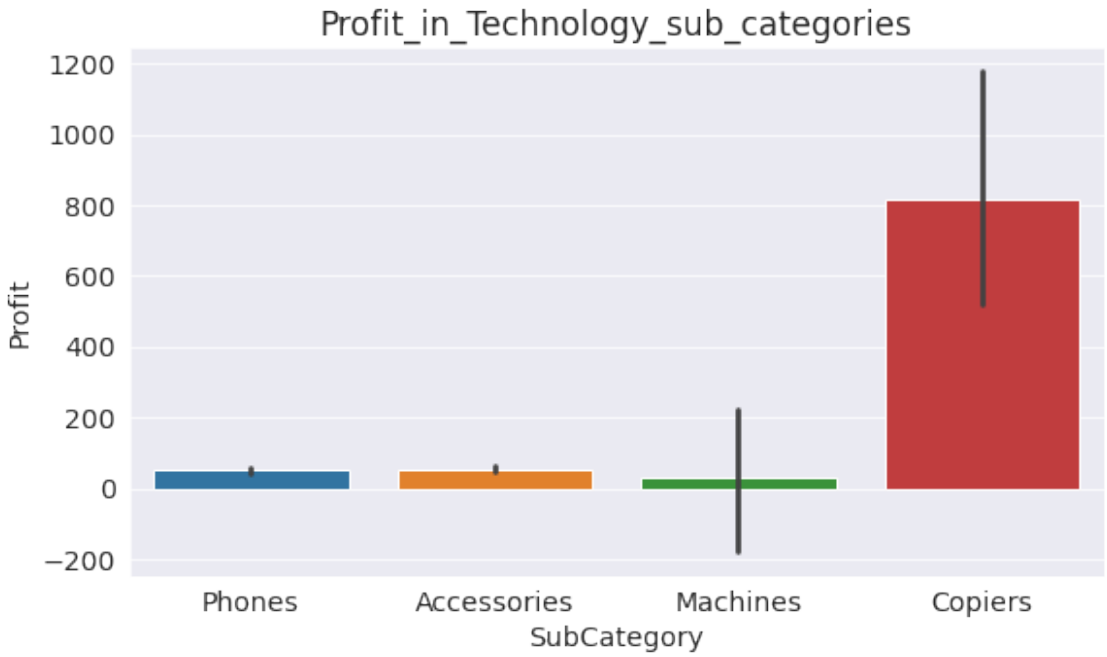
```
9986        90008     West  Technology  Accessories    36.240         1
9987        30605    South  Technology  Accessories    79.990         1
9988        30605    South  Technology       Phones   206.100         5
9991        92627     West  Technology       Phones   258.576         2

      Discount    Profit
7          0.2   90.7152
11         0.2   68.3568
19         0.2   16.0110
26         0.0   11.7741
35         0.2  123.4737
…          …        …
9983       0.0   27.4344
9986       0.0   15.2208
9987       0.0   28.7964
9988       0.0   55.6470
9991       0.2   19.3932

[1847 rows x 13 columns]
```

Plot showing total profits in all subcategories of technology.

[22]:
```
Technology ='Profit_in_Technology_sub_categories'
sns.barplot(df_Technology.SubCategory,df_Technology.Profit)
plt.xlabel('SubCategory')
plt.ylabel('Profit')
plt.title(Technology)
```

```
/opt/conda/lib/python3.9/site-packages/seaborn/_decorators.py:36: FutureWarning:
Pass the following variables as keyword args: x, y. From version 0.12, the only
valid positional argument will be `data`, and passing other arguments without an
explicit keyword will result in an error or misinterpretation.
  warnings.warn(
```

[22]:
```
Text(0.5, 1.0, 'Profit_in_Technology_sub_categories')
```



[23]:
```
list = df['State'].tolist()
```

[32]:
```
res = []
for i in list:
    if i not in res:
        res.append(i)
print(str(res))
```

```
['Alabama', 'Arizona', 'Arkansas', 'California', 'Colorado', 'Connecticut',
'Delaware', 'District of Columbia', 'Florida', 'Georgia', 'Idaho', 'Illinois',
'Indiana', 'Iowa', 'Kansas', 'Kentucky', 'Louisiana', 'Maine', 'Maryland',
'Massachusetts', 'Michigan', 'Minnesota', 'Mississippi', 'Missouri', 'Montana',
'Nebraska', 'Nevada', 'New Hampshire', 'New Jersey', 'New Mexico', 'New York',
'North Carolina', 'North Dakota', 'Ohio', 'Oklahoma', 'Oregon', 'Pennsylvania',
'Rhode Island', 'South Carolina', 'South Dakota', 'Tennessee', 'Texas', 'Utah',
'Vermont', 'Virginia', 'Washington', 'West Virginia', 'Wisconsin', 'Wyoming']
```

2 Analyzing state wise performance of a particular category.

Filtered data : Data for state 'Alabama' and Category 'Furniture'.

[39]:
```
df_furniture_and_State =df.loc[(df['Category'] == 'Furniture') & (df['State']␣
↪=='Alabama')]
df_furniture_and_State
```

[39]:

	Ship Mode	Segment	Country	City	State
1433	Second Class	Consumer	United States	Florence	Alabama
1977	Second Class	Corporate	United States	Montgomery	Alabama
2013	Standard Class	Consumer	United States	Auburn	Alabama
3481	First Class	Consumer	United States	Mobile	Alabama
3816	Standard Class	Consumer	United States	Mobile	Alabama
3818	Standard Class	Consumer	United States	Mobile	Alabama
5555	Second Class	Corporate	United States	Montgomery	Alabama
5926	Standard Class	Corporate	United States	Decatur	Alabama
6254	Standard Class	Corporate	United States	Montgomery	Alabama
6824	Standard Class	Corporate	United States	Montgomery	Alabama
7150	Standard Class	Home Office	United States	Tuscaloosa	Alabama

	Postal Code	Region	Category	SubCategory	Sales	Quantity	Discount
1433	35630	South	Furniture	Chairs	1819.86	14	0.0
1977	36116	South	Furniture	Chairs	545.88	6	0.0
2013	36830	South	Furniture	Chairs	350.98	1	0.0
3481	36608	South	Furniture	Furnishings	8.96	2	0.0
3816	36608	South	Furniture	Tables	801.96	2	0.0
3818	36608	South	Furniture	Chairs	1056.86	7	0.0
5555	36116	South	Furniture	Furnishings	10.16	2	0.0
5926	35601	South	Furniture	Tables	1215.92	8	0.0
6254	36116	South	Furniture	Furnishings	21.36	8	0.0
6824	36116	South	Furniture	Tables	358.58	2	0.0
7150	35401	South	Furniture	Chairs	141.96	2	0.0

	Profit
1433	163.7874
1977	70.9644
2013	84.2352
3481	2.7776
3816	200.4900
3818	306.4894
5555	3.4544
5926	316.1392
6254	8.1168
6824	39.4438
7150	35.4900

List of all cities in the state of 'Alabama'

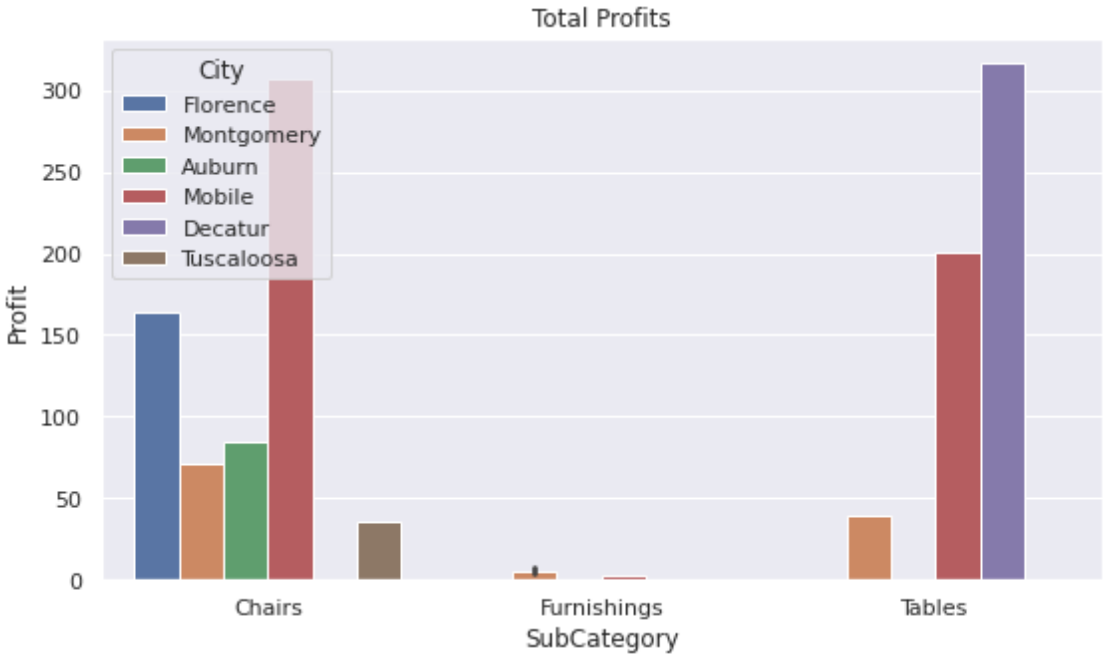
[34]:
```
list = df_furniture_and_State['City'].tolist()
res = []
for i in list:
    if i not in res:
        res.append(i)
print(str(res))
```

```
['Florence', 'Montgomery', 'Auburn', 'Mobile', 'Decatur', 'Tuscaloosa']
```

Plot showing total profits in all cities of Alabama for all subcategories of furniture.

[36]:
```
sns.barplot(x=df_furniture_and_State.SubCategory,y = df_furniture_and_State.
↪Profit,hue=df_furniture_and_State.City,data=df_furniture_and_State)
sns.set(rc={'figure.figsize':(10,10)})
plt.title('Total Profits')
```

[36]:
```
Text(0.5, 1.0, 'Total Profits')
```



Filtered data : Data for state 'Arizona' and Category 'Furniture'.

[40]:
```
df_furniture_and_State =df.loc[(df['Category'] == 'Furniture') & (df['State']␣
↪=='Arizona')]
df_furniture_and_State
```

[40]:

	Ship Mode	Segment	Country	City	State	\
462	Standard Class	Home Office	United States	Phoenix	Arizona	
463	Standard Class	Home Office	United States	Phoenix	Arizona	
946	First Class	Consumer	United States	Mesa	Arizona	
1367	First Class	Corporate	United States	Tucson	Arizona	
1409	Standard Class	Consumer	United States	Phoenix	Arizona	
1465	Standard Class	Consumer	United States	Glendale	Arizona	
1521	Standard Class	Consumer	United States	Tucson	Arizona	
1979	Same Day	Consumer	United States	Glendale	Arizona	

```
2041  Standard Class  Home Office  United States         Peoria  Arizona
2081  Standard Class     Consumer  United States        Phoenix  Arizona
2102        Same Day  Home Office  United States         Tucson  Arizona
2308     First Class  Home Office  United States         Peoria  Arizona
2541  Standard Class    Corporate  United States     Scottsdale  Arizona
2659  Standard Class    Corporate  United States        Gilbert  Arizona
2871  Standard Class    Corporate  United States         Tucson  Arizona
2885  Standard Class     Consumer  United States          Tempe  Arizona
2951        Same Day  Home Office  United States       Glendale  Arizona
2952        Same Day  Home Office  United States       Glendale  Arizona
3882  Standard Class     Consumer  United States        Gilbert  Arizona
3883  Standard Class     Consumer  United States        Gilbert  Arizona
3914  Standard Class     Consumer  United States        Phoenix  Arizona
3915  Standard Class     Consumer  United States        Phoenix  Arizona
3918  Standard Class     Consumer  United States        Phoenix  Arizona
4336  Standard Class     Consumer  United States  Bullhead City  Arizona
4689     First Class     Consumer  United States         Tucson  Arizona
4691     First Class     Consumer  United States         Tucson  Arizona
5011     First Class    Corporate  United States        Phoenix  Arizona
5147  Standard Class  Home Office  United States       Chandler  Arizona
5148  Standard Class  Home Office  United States       Chandler  Arizona
5465     First Class     Consumer  United States     Scottsdale  Arizona
5542  Standard Class    Corporate  United States         Tucson  Arizona
6001  Standard Class    Corporate  United States        Phoenix  Arizona
6042  Standard Class     Consumer  United States   Sierra Vista  Arizona
6045  Standard Class    Corporate  United States         Tucson  Arizona
6658  Standard Class  Home Office  United States        Gilbert  Arizona
6659  Standard Class  Home Office  United States        Gilbert  Arizona
6678  Standard Class  Home Office  United States        Phoenix  Arizona
6799  Standard Class    Corporate  United States        Phoenix  Arizona
6803  Standard Class    Corporate  United States        Phoenix  Arizona
6976  Standard Class    Corporate  United States        Gilbert  Arizona
7151    Second Class     Consumer  United States           Mesa  Arizona
7357  Standard Class  Home Office  United States        Phoenix  Arizona
7865    Second Class     Consumer  United States           Mesa  Arizona
7866    Second Class     Consumer  United States           Mesa  Arizona
8813  Standard Class    Corporate  United States       Glendale  Arizona
9040  Standard Class    Corporate  United States       Chandler  Arizona
9385  Standard Class     Consumer  United States           Mesa  Arizona
9401  Standard Class     Consumer  United States         Tucson  Arizona
9540    Second Class  Home Office  United States        Phoenix  Arizona

      Postal Code Region   Category  SubCategory     Sales  Quantity  \
462         85023   West  Furniture  Furnishings    23.560         5
463         85023   West  Furniture       Tables  1272.630         6
946         85204   West  Furniture       Tables   393.165         3
1367        85705   West  Furniture       Chairs   899.136         4
```

1409	85023	West	Furniture	Tables	393.165	3
1465	85301	West	Furniture	Furnishings	121.376	4
1521	85705	West	Furniture	Furnishings	206.112	6
1979	85301	West	Furniture	Chairs	933.536	4
2041	85345	West	Furniture	Furnishings	75.360	5
2081	85023	West	Furniture	Furnishings	7.712	2
2102	85705	West	Furniture	Chairs	259.136	4
2308	85345	West	Furniture	Chairs	280.792	1
2541	85254	West	Furniture	Furnishings	111.888	7
2659	85234	West	Furniture	Chairs	883.840	4
2871	85705	West	Furniture	Chairs	314.352	3
2885	85281	West	Furniture	Chairs	307.920	5
2951	85301	West	Furniture	Chairs	113.888	2
2952	85301	West	Furniture	Furnishings	113.568	2
3882	85234	West	Furniture	Furnishings	364.704	6
3883	85234	West	Furniture	Furnishings	40.256	4
3914	85023	West	Furniture	Tables	801.600	5
3915	85023	West	Furniture	Chairs	161.568	2
3918	85023	West	Furniture	Chairs	311.976	3
4336	86442	West	Furniture	Furnishings	14.368	2
4689	85705	West	Furniture	Furnishings	51.968	2
4691	85705	West	Furniture	Chairs	242.352	3
5011	85023	West	Furniture	Bookcases	209.979	7
5147	85224	West	Furniture	Furnishings	8.544	4
5148	85224	West	Furniture	Chairs	842.376	3
5465	85254	West	Furniture	Bookcases	181.470	5
5542	85705	West	Furniture	Tables	455.970	6
6001	85023	West	Furniture	Furnishings	87.960	3
6042	85635	West	Furniture	Furnishings	14.368	2
6045	85705	West	Furniture	Furnishings	238.152	3
6658	85234	West	Furniture	Furnishings	68.704	2
6659	85234	West	Furniture	Tables	386.910	9
6678	85023	West	Furniture	Furnishings	46.872	7
6799	85023	West	Furniture	Tables	35.445	1
6803	85023	West	Furniture	Chairs	47.968	2
6976	85234	West	Furniture	Furnishings	621.760	4
7151	85204	West	Furniture	Tables	182.550	2
7357	85023	West	Furniture	Furnishings	169.568	2
7865	85204	West	Furniture	Chairs	441.920	2
7866	85204	West	Furniture	Bookcases	127.764	6
8813	85301	West	Furniture	Chairs	266.352	3
9040	85224	West	Furniture	Tables	73.915	1
9385	85204	West	Furniture	Furnishings	120.576	8
9401	85705	West	Furniture	Furnishings	4.272	2
9540	85023	West	Furniture	Chairs	191.968	7

```
      Discount    Profit
```

462	0.2	7.0680
463	0.5	-814.4832
946	0.5	-204.4458
1367	0.2	-146.1096
1409	0.5	-204.4458
1465	0.2	-3.0344
1521	0.2	48.9516
1979	0.2	105.0228
2041	0.2	20.7240
2081	0.2	1.7352
2102	0.2	-25.9136
2308	0.2	35.0990
2541	0.2	22.3776
2659	0.2	99.4320
2871	0.2	-35.3646
2885	0.2	-34.6410
2951	0.2	9.9652
2952	0.2	-5.6784
3882	0.2	-36.4704
3883	0.2	11.0704
3914	0.5	-448.8960
3915	0.2	10.0980
3918	0.2	-42.8967
4336	0.2	3.9512
4689	0.2	10.3936
4691	0.2	-42.4116
5011	0.7	-356.9643
5147	0.2	1.9224
5148	0.2	105.2970
5465	0.7	-320.5970
5542	0.5	-218.8656
6001	0.2	7.6965
6042	0.2	3.9512
6045	0.2	89.3070
6658	0.2	16.3172
6659	0.5	-185.7168
6678	0.2	3.5154
6799	0.5	-24.1026
6803	0.2	4.1972
6976	0.2	46.6320
7151	0.5	-135.0870
7357	0.2	0.0000
7865	0.2	49.7160
7866	0.7	-191.6460
8813	0.2	13.3176
9040	0.5	-45.8273
9385	0.2	33.1584

```
9401        0.2     0.9612
9540        0.2    16.7972
```

List of all cities in the state of 'Arizona'.

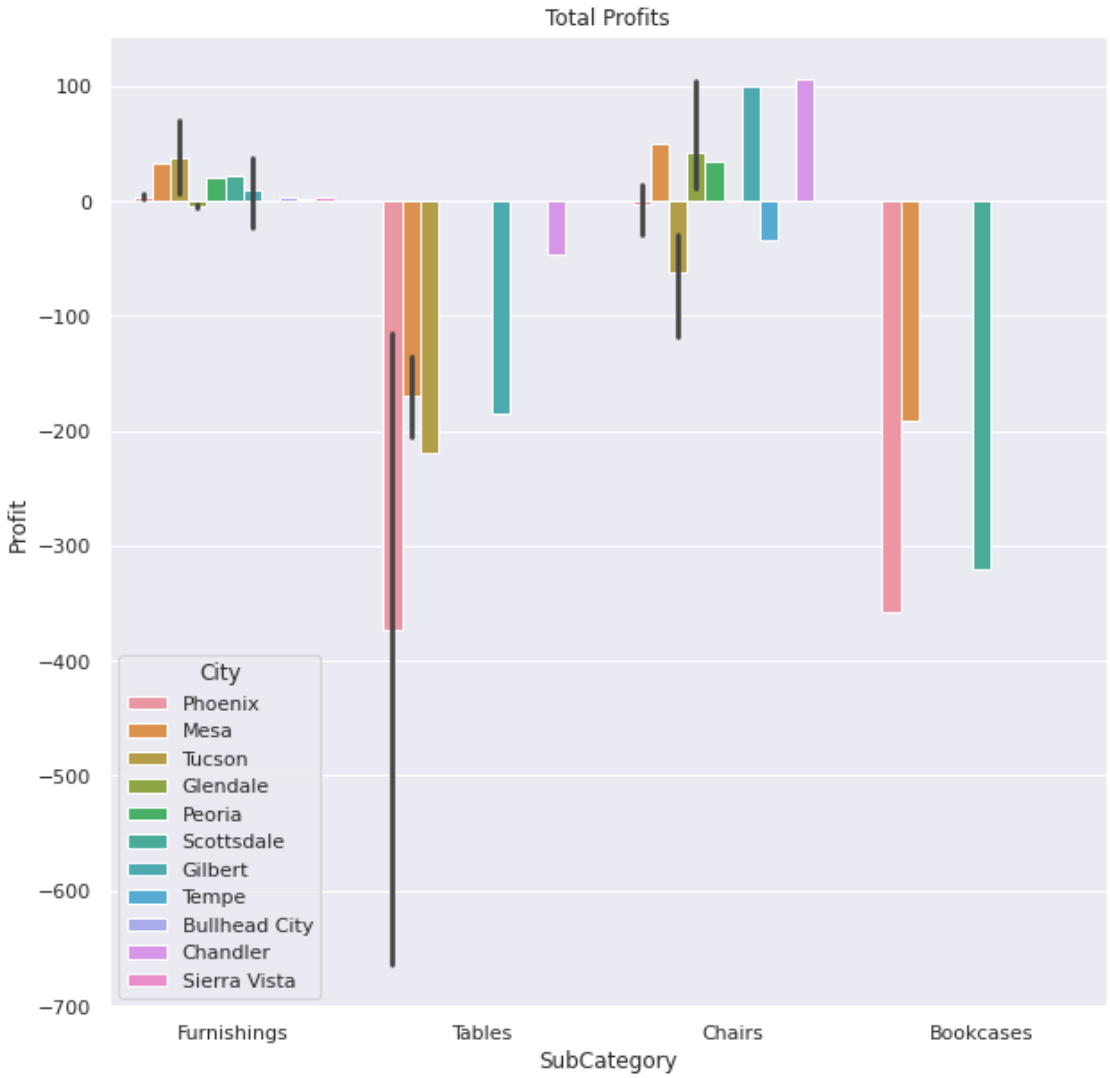
[41]:
```
list = df_furniture_and_State['City'].tolist()
res = []
for i in list:
    if i not in res:
        res.append(i)
print(str(res))
```

```
['Phoenix', 'Mesa', 'Tucson', 'Glendale', 'Peoria', 'Scottsdale', 'Gilbert',
'Tempe', 'Bullhead City', 'Chandler', 'Sierra Vista']
```

Plot showing total profits in all cities of Arizona for all subcategories of furniture.

[43]:
```
sns.barplot(x=df_furniture_and_State.SubCategory,y = df_furniture_and_State.
 ↪Profit,hue=df_furniture_and_State.City,data=df_furniture_and_State)
sns.set(rc={'figure.figsize':(10,10)})
plt.title('Total Profits')
```

[43]:
```
Text(0.5, 1.0, 'Total Profits')
```



In similar way we can plot graphs for all states and for all categories.

Solution : By interpreting graphs of above type, one can conclude which category earns more profit in which city and manager can focus on increasing sale of that particular category in that state.

[ ]: