REG PLOT

Plot data and a linear regression model fit

Finds the best fit linear regression line which helps to predict the amount of change in Y on one unit change in X

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

In [2]:
```
tips = sns.load_dataset('tips')
tips.head()
```

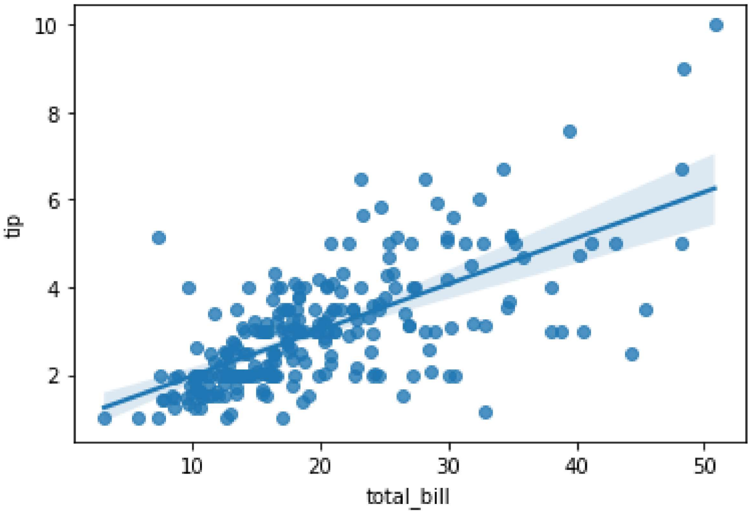
Out[2]:

	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4

1. Create a basic reg plot

In [3]:
```
sns.regplot(data=tips,x='total_bill',y='tip')
```

Out[3]:
```
<AxesSubplot:xlabel='total_bill', ylabel='tip'>
```

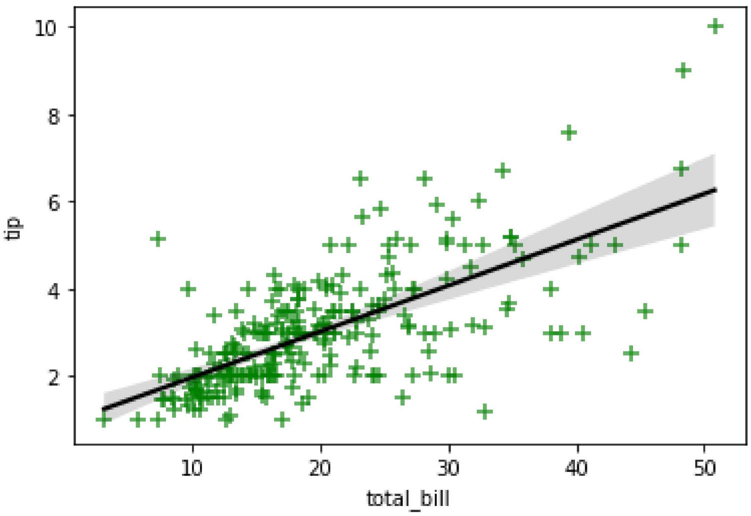


2. Change the styling of reg plot, only line, only scatter, show/hide the ci, change the ci value, change n_boot

In [12]:
```
sns.regplot(data=tips,x='total_bill',y='tip', #ci = None,
            color='green',marker='+',
            line_kws=dict(color='black'),
            scatter_kws=dict(s=80,alpha=0.8),
            n_boot=1500)
```

Out[12]:

```
<AxesSubplot:xlabel='total_bill', ylabel='tip'>
```



HEAT MAPS

A heatmap is a graphical representation of data where values are depicted by color.

In [2]:

```
mart=pd.read_csv(r'C:\Users\lenovo\Downloads\train.csv')
mart.columns = mart.columns.str.lower()
mart.head()
```

Out[2]:

	item_id	item_w	item_type	item_mrp	outlet_id	outlet_year	outlet_size	outlet_location_type
0	FDU32	21.027499	Baking Goods	197.352319	OUT046	2004	Small	Tier 2
1	NCT54	21.102371	Meat	148.250214	OUT035	1987	Small	Tier 1
2	FDW08	20.882263	Hard Drinks	205.465010	OUT035	1999	Small	Tier 3
3	FDJ22	21.050435	Starchy Foods	253.417583	OUT046	1996	Small	Tier 1
4	FDF47	21.247876	Baking Goods	240.871039	OUT035	1988	Small	Tier 3

In [32]:

```
mart.shape
```

Out[32]:

```
(87864, 9)
```

In [3]:

```
martPiv = mart.pivot_table(index='outlet_year',columns='outlet_size',values='sales')
martPiv
```

Out[3]:

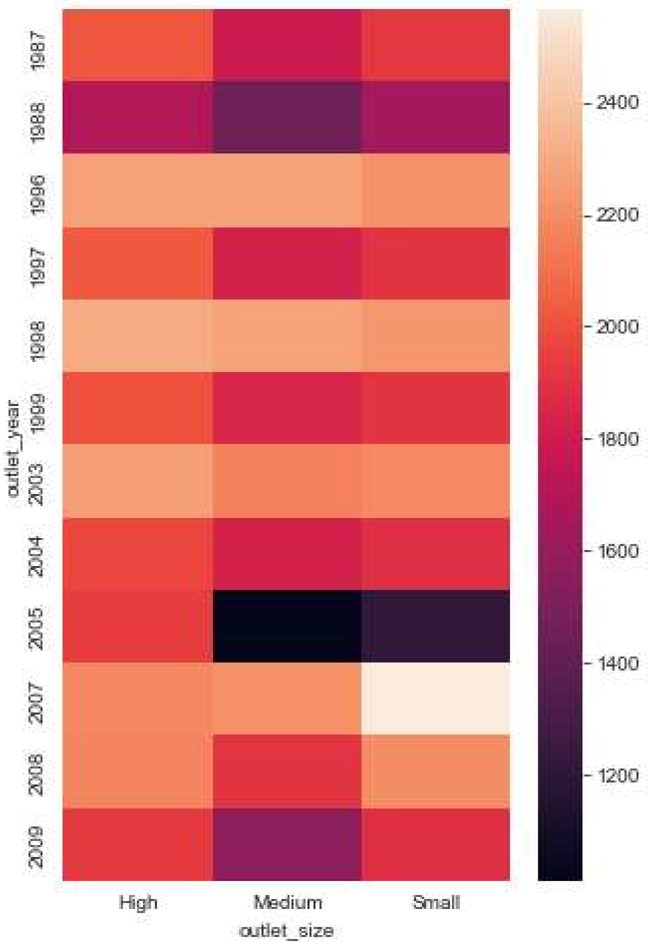
outlet_size	**High**	**Medium**	**Small**
outlet_year			
1987	2015.037160	1792.973492	1917.302712
1988	1695.209700	1444.865311	1641.739583
1996	2265.268983	2272.371502	2219.790139
1997	2029.428925	1826.732664	1903.967543
1998	2306.542273	2279.666103	2233.775392
1999	2004.082749	1850.282194	1909.920236
2003	2261.028030	2158.063891	2190.118601
2004	1966.898730	1826.582596	1889.009488
2005	1935.238262	1010.230431	1215.937098
2007	2180.578424	2213.387887	2567.411612
2008	2169.407763	1900.378559	2201.448849
2009	1923.770187	1554.601061	1890.260032

In [43]:

```
sns.set_style('white')
plt.figure(figsize=(5,8))
sns.heatmap(martPiv)
```

Out[43]:

```
<AxesSubplot:xlabel='outlet_size', ylabel='outlet_year'>
```

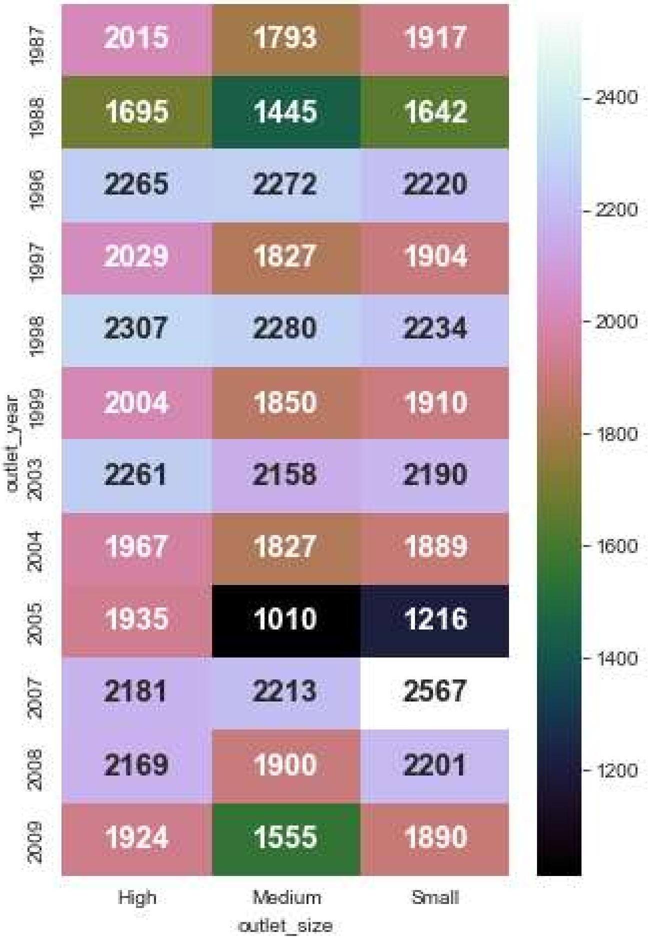


In [51]:

```
sns.set_style('white')
plt.figure(figsize=(5,8))
sns.heatmap(martPiv,
            annot=True, #to display values
            fmt='.0f', #to round the numbers
            annot_kws=dict(size=15,weight='bold'),
            #linewidth=0.5
            #linecolor='black
            cmap='cubehelix')
```

Out[51]:

```
<AxesSubplot:xlabel='outlet_size', ylabel='outlet_year'>
```



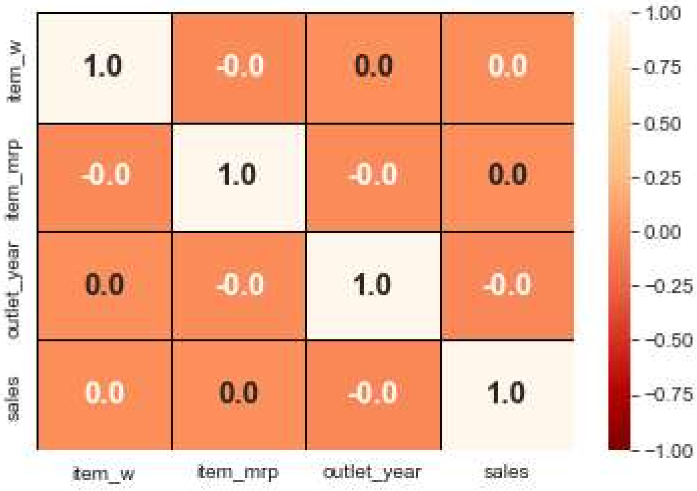
In [52]:
```
mart.corr()
```

Out[52]:

	item_w	item_mrp	outlet_year	sales
item_w	1.000000	-0.022830	0.009632	0.000615
item_mrp	-0.022830	1.000000	-0.009837	0.014813
outlet_year	0.009632	-0.009837	1.000000	-0.035701
sales	0.000615	0.014813	-0.035701	1.000000

In [66]:
```
sns.heatmap(mart.corr(),
            vmin=-1,
            vmax=1,
            center=0,
            cmap='OrRd_r',
            annot=True,
            fmt='.1f',
            annot_kws=dict(size=15,weight='bold'),
            linecolor='black',
            linewidths=0.5)
```

Out[66]:
```
<AxesSubplot:>
```



CLUSTER MAP

Plot a matrix dataset as hierarchically clustered heatmap

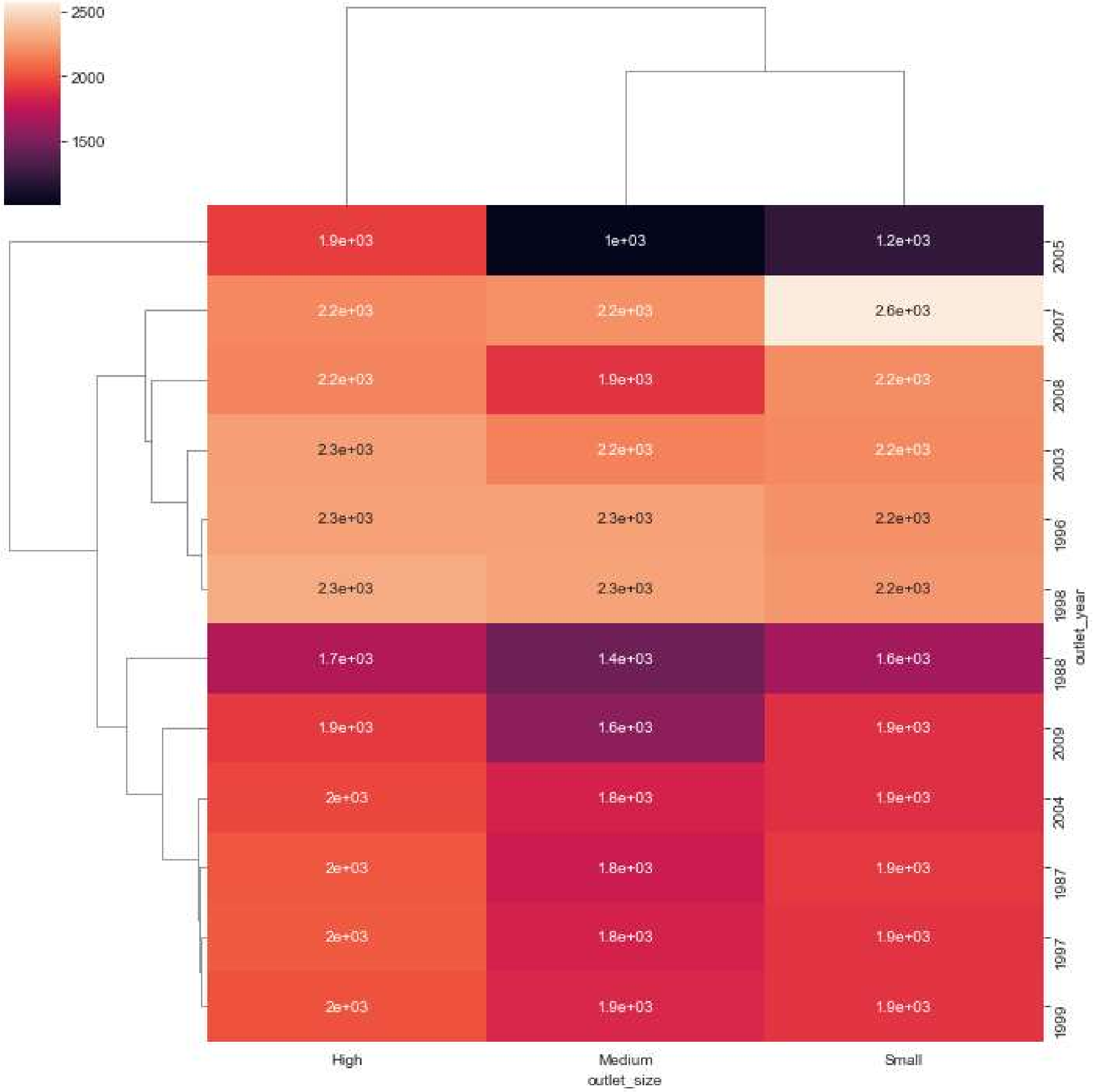
In [67]:
```
martPiv.head()
```

Out[67]:

outlet_size outlet_year	High	Medium	Small
1987	2015.037160	1792.973492	1917.302712
1988	1695.209700	1444.865311	1641.739583
1996	2265.268983	2272.371502	2219.790139
1997	2029.428925	1826.732664	1903.967543
1998	2306.542273	2279.666103	2233.775392

In [69]:
```
sns.clustermap(martPiv,
               #col_cluster=False, -- to remove the col clustering
               #row_cluster = False, -- to remove the row clustering
               annot=True,
               #z_score = 1,   -- 1 or 0\
               #standard_scale=1
               )
```

Out[69]:
```
<seaborn.matrix.ClusterGrid at 0x25b244f5520>
```



FACET GRID PLOT

Multi-plot grid for plotting conditional relationships

In [70]:
```
mart.head()
```

Out[70]:

	item_id	item_w	item_type	item_mrp	outlet_id	outlet_year	outlet_size	outlet_location_type
0	FDU32	21.027499	Baking Goods	197.352319	OUT046	2004	Small	Tier 2
1	NCT54	21.102371	Meat	148.250214	OUT035	1987	Small	Tier 1
2	FDW08	20.882263	Hard Drinks	205.465010	OUT035	1999	Small	Tier 3
3	FDJ22	21.050435	Starchy Foods	253.417583	OUT046	1996	Small	Tier 1
4	FDF47	21.247876	Baking Goods	240.871039	OUT035	1988	Small	Tier 3

In [71]:

```
mart.outlet_size.unique()
```

Out[71]:

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

In [73]:

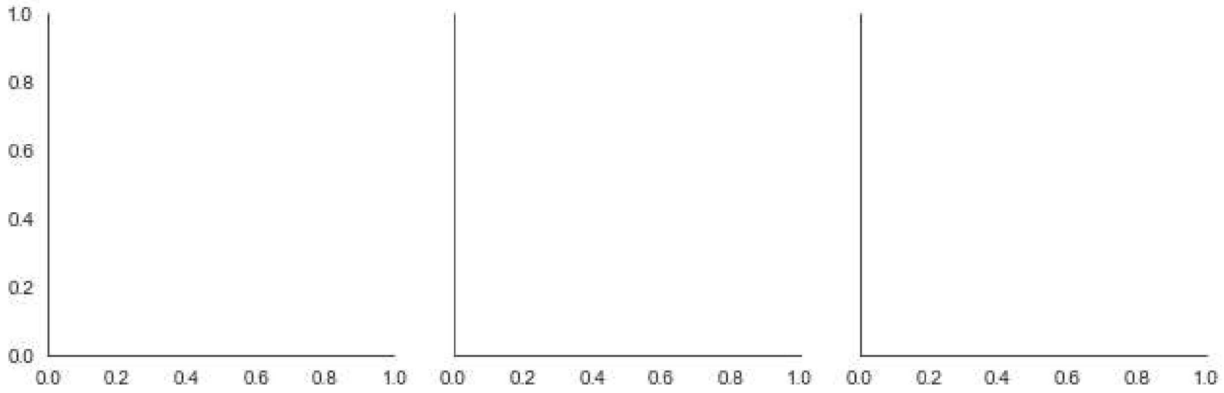
```
mart.outlet_location_type.unique()
```

Out[73]:

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

In [75]:

```
var = sns.FacetGrid(mart,col='outlet_size')
```

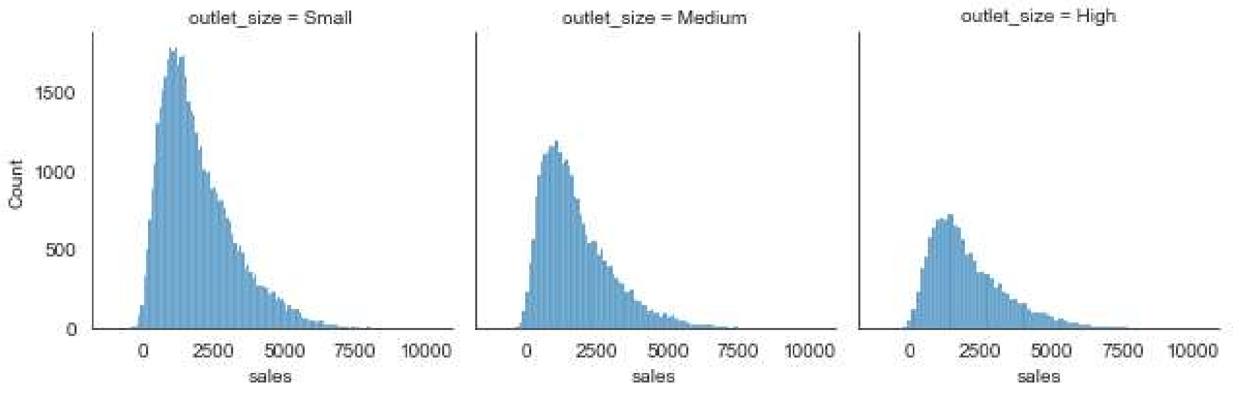


In [76]:

```
var = sns.FacetGrid(mart,col='outlet_size')
var.map_dataframe(sns.histplot,x='sales')
```

Out[76]:

```
<seaborn.axisgrid.FacetGrid at 0x25b27608160>
```

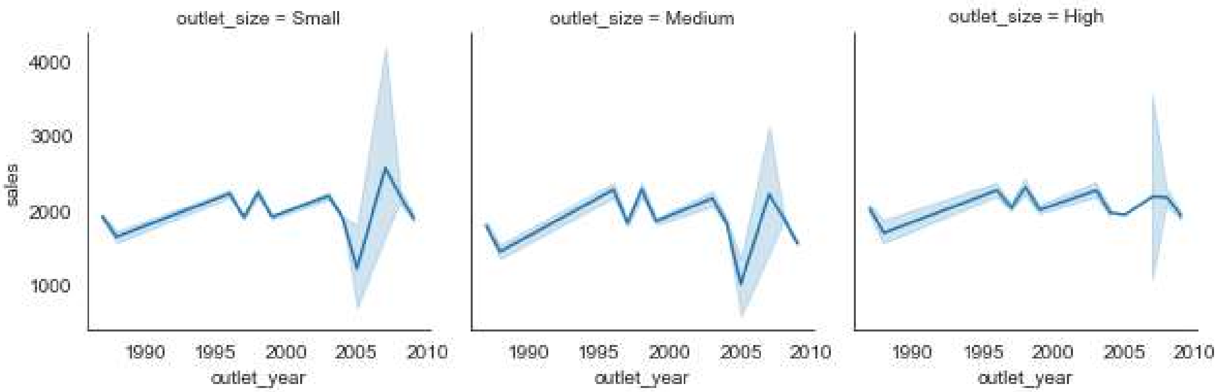


In [79]:

```
var = sns.FacetGrid(mart,col='outlet_size')
var.map_dataframe(sns.lineplot,x='outlet_year',y='sales')
```

Out[79]:

```
<seaborn.axisgrid.FacetGrid at 0x25b27cc21c0>
```

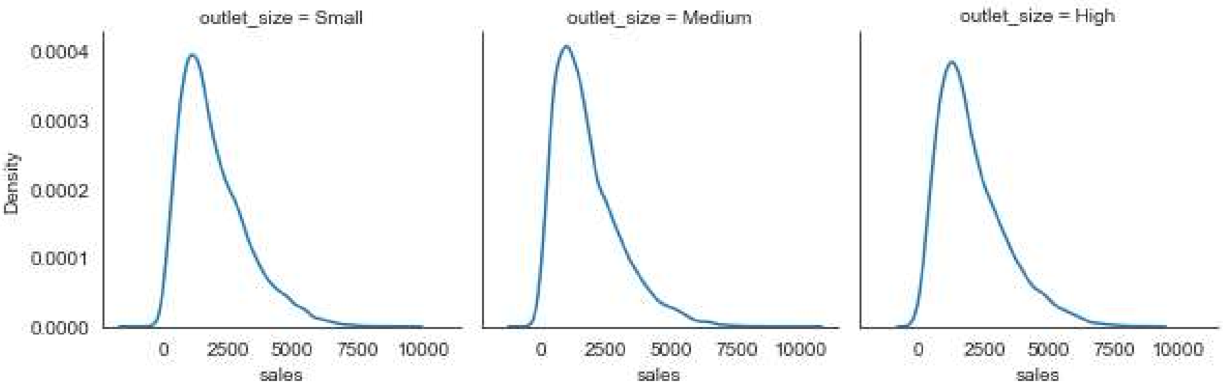


In [81]:

```
var = sns.FacetGrid(mart,col='outlet_size')
var.map_dataframe(sns.kdeplot,x='sales')
```

Out[81]:

```
<seaborn.axisgrid.FacetGrid at 0x25b287fab20>
```

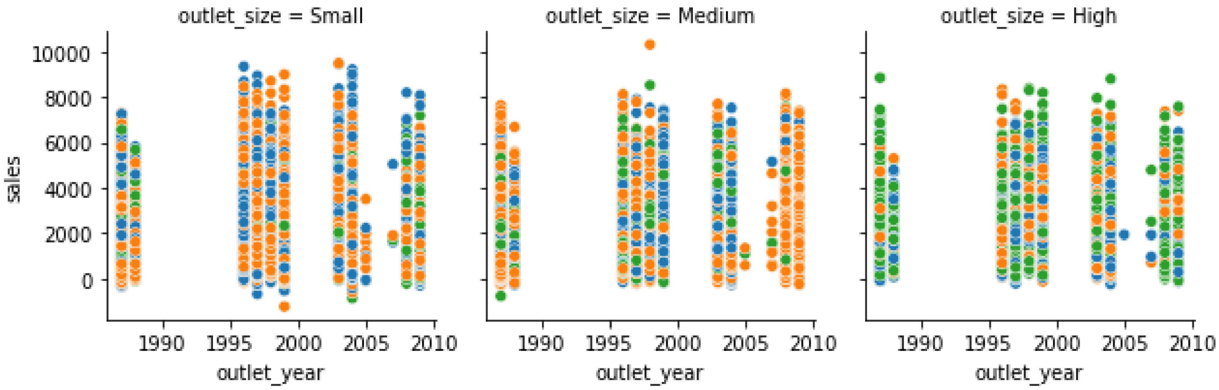


In [11]:

```
var = sns.FacetGrid(mart,col='outlet_size')
var.map_dataframe(sns.scatterplot,x='outlet_year',y='sales', hue='outlet_location_type
```

Out[11]:

```
<seaborn.axisgrid.FacetGrid at 0x24e82c782b0>
```



In [22]:

```
var = sns.FacetGrid(mart,col='outlet_size',row='outlet_location_type',
                    sharey=False, #to have unique y axes for each plot
                    ylim = (0,1000) # y axes limit'
                   )
```

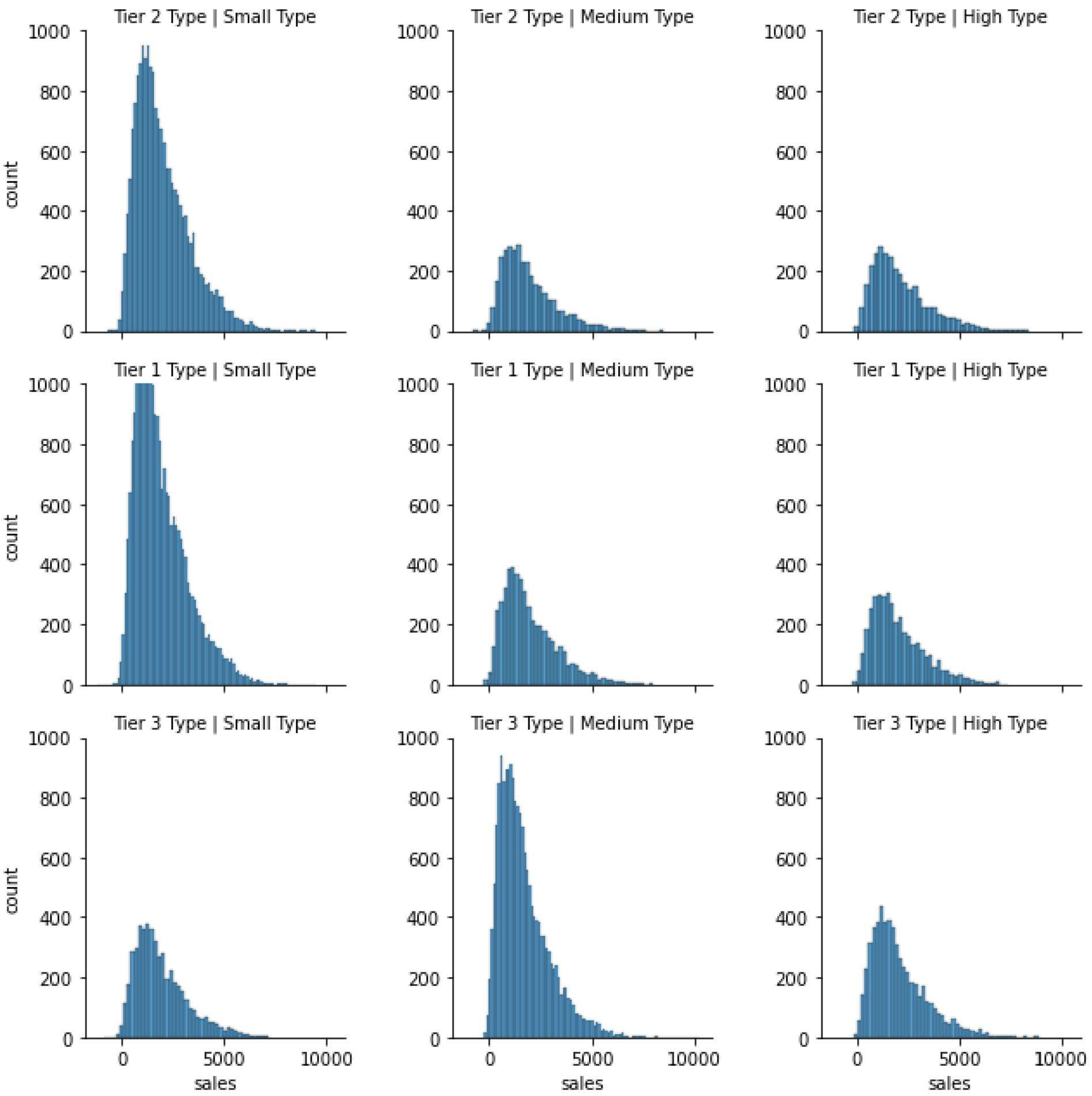
```
var.map_dataframe(sns.histplot,x='sales')

var.set_axis_labels('sales','count') #setting labels for the axis

var.set_titles(col_template='{col_name} Type',row_template='{row_name} Type')
```

Out[22]:

```
<seaborn.axisgrid.FacetGrid at 0x24e8cefeaf0>
```



In [ ]: