1 EDA

In [1]:

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

executed in 4.81s, finished 08:43:01 2019-01-29

In [2]:

```
%matplotlib inline
```

executed in 38ms, finished 08:43:02 2019-01-29

In [3]:

```
train = pd.read_csv('train.csv')
```

executed in 416ms, finished 08:43:02 2019-01-29

In [4]:

```
train.info()
```

executed in 384ms, finished 08:43:02 2019-01-29

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4990 entries, 0 to 4989
Data columns (total 13 columns):
Product_Identifier                4990 non-null object
Supermarket_Identifier            4990 non-null object
Product_Supermarket_Identifier    4990 non-null object
Product_Weight                    4188 non-null float64
Product_Fat_Content               4990 non-null object
Product_Shelf_Visibility          4990 non-null float64
Product_Type                      4990 non-null object
Product_Price                     4990 non-null float64
Supermarket_Opening_Year          4990 non-null int64
Supermarket _Size                 3540 non-null object
Supermarket_Location_Type         4990 non-null object
Supermarket_Type                  4990 non-null object
Product_Supermarket_Sales         4990 non-null float64
dtypes: float64(4), int64(1), object(8)
memory usage: 506.9+ KB
```

In [5]:

```
train.nunique()
```

executed in 448ms, finished 08:43:03 2019-01-29

Out[5]:

```
Product_Identifier               1451
Supermarket_Identifier             10
Product_Supermarket_Identifier   4990
Product_Weight                    399
Product_Fat_Content                 3
Product_Shelf_Visibility         4638
Product_Type                       16
Product_Price                    3522
Supermarket_Opening_Year            9
Supermarket _Size                   3
Supermarket_Location_Type           3
Supermarket_Type                    4
Product_Supermarket_Sales        2686
dtype: int64
```

In [6]:

```
cat_col=[col for col in train.columns if train[col].nunique()<20]
```

executed in 270ms, finished 08:43:03 2019-01-29

In [7]:

```
num_col=list(set(train.columns)-set(cat_col))
```

executed in 352ms, finished 08:43:03 2019-01-29

In [8]:

```
cat_col
```

executed in 371ms, finished 08:43:04 2019-01-29

Out[8]:

```
['Supermarket_Identifier',
 'Product_Fat_Content',
 'Product_Type',
 'Supermarket_Opening_Year',
 'Supermarket _Size',
 'Supermarket_Location_Type',
 'Supermarket_Type']
```

In [9]:

```
num_col
```

executed in 318ms, finished 08:43:04 2019-01-29

Out[9]:

```
['Product_Supermarket_Sales',
 'Product_Weight',
 'Product_Supermarket_Identifier',
 'Product_Price',
 'Product_Shelf_Visibility',
 'Product_Identifier']
```

In [10]:

```
num_col=['Product_Price',
 'Product_Supermarket_Sales',
 'Product_Weight',
 'Product_Shelf_Visibility']
```

executed in 275ms, finished 08:43:04 2019-01-29

In [11]:

```
train['Supermarket _Size'].fillna('unknown',inplace=True)
train['Product_Weight'].fillna(train['Product_Weight'].mean(),inplace=True);
```

executed in 245ms, finished 08:43:05 2019-01-29

In [12]:

```
train.isnull().sum()
```

executed in 278ms, finished 08:43:05 2019-01-29

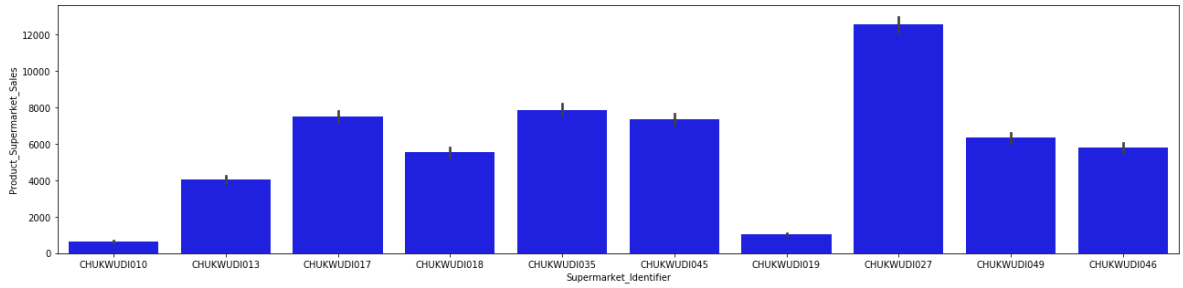
Out[12]:

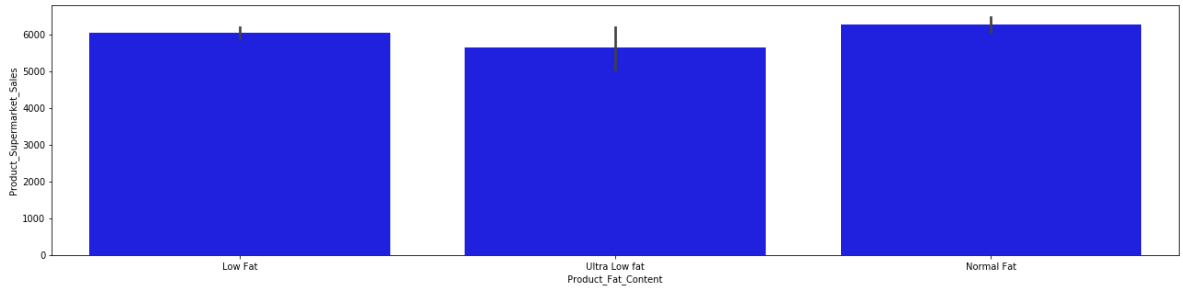
```
Product_Identifier               0
Supermarket_Identifier           0
Product_Supermarket_Identifier   0
Product_Weight                   0
Product_Fat_Content              0
Product_Shelf_Visibility         0
Product_Type                     0
Product_Price                    0
Supermarket_Opening_Year         0
Supermarket _Size                0
Supermarket_Location_Type        0
Supermarket_Type                 0
Product_Supermarket_Sales        0
dtype: int64
```

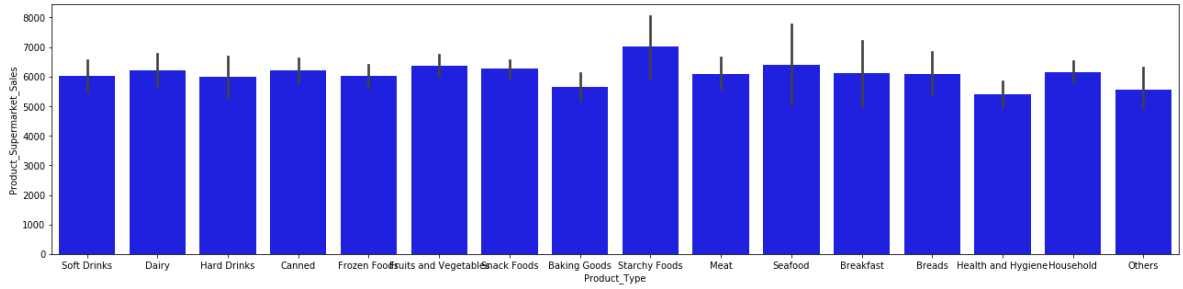
In [13]:

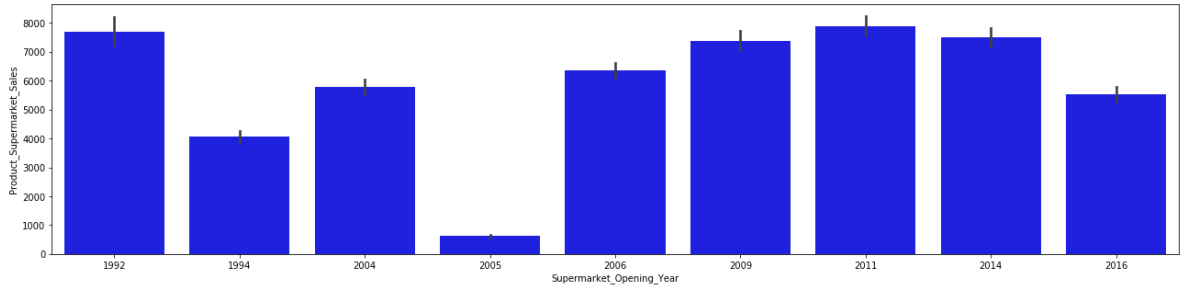
```
def plot_bar(data, cols, col_y = None):
    for col in cols:
        plt.figure(figsize=(22,5))
        sns.barplot(y=col_y, x=col, data=data,color='blue')
        plt.ylabel(col_y) # Set text for the x axis
        plt.xlabel(col)# Set text for y axis
        plt.show()

plot_bar(data=train,cols=cat_col,col_y='Product_Supermarket_Sales')
```

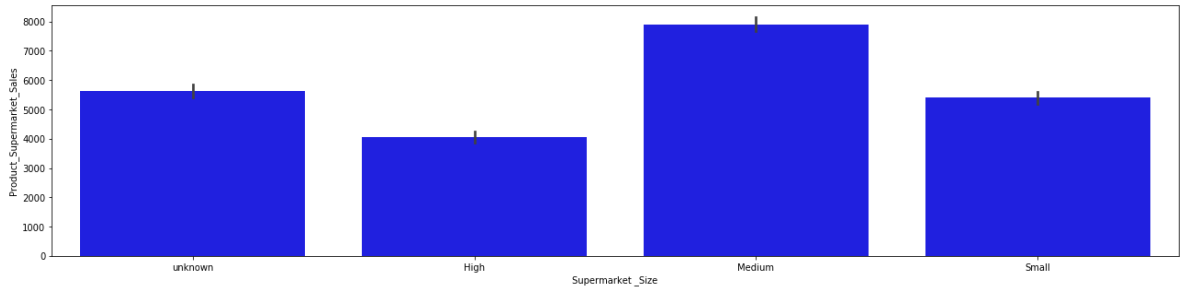
executed in 14.7s, finished 08:43:20 2019-01-29

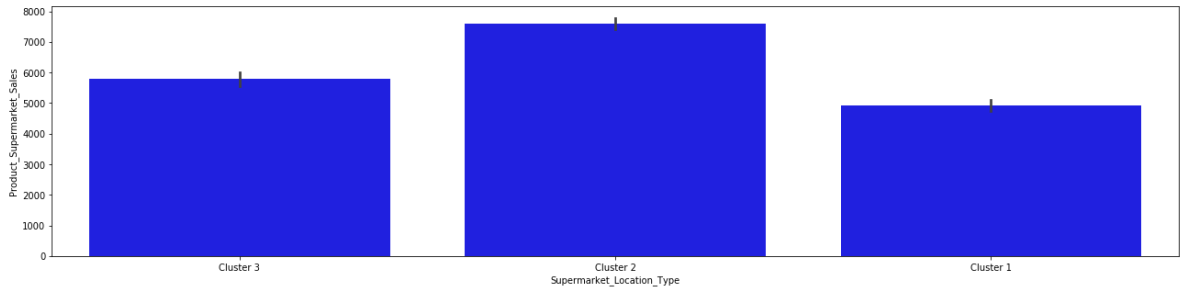


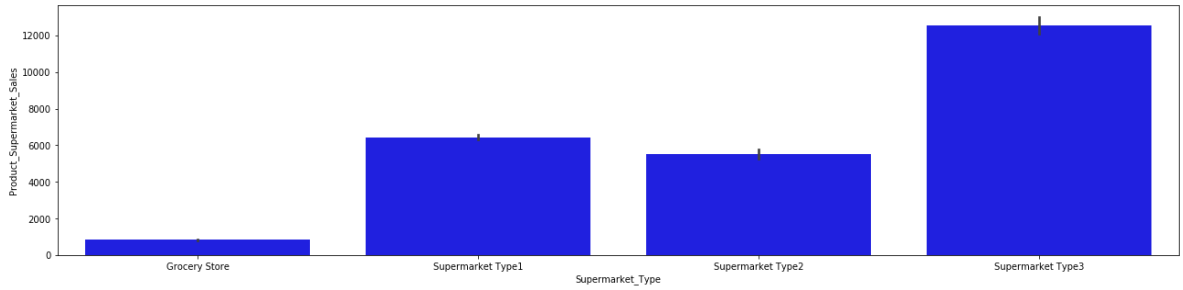








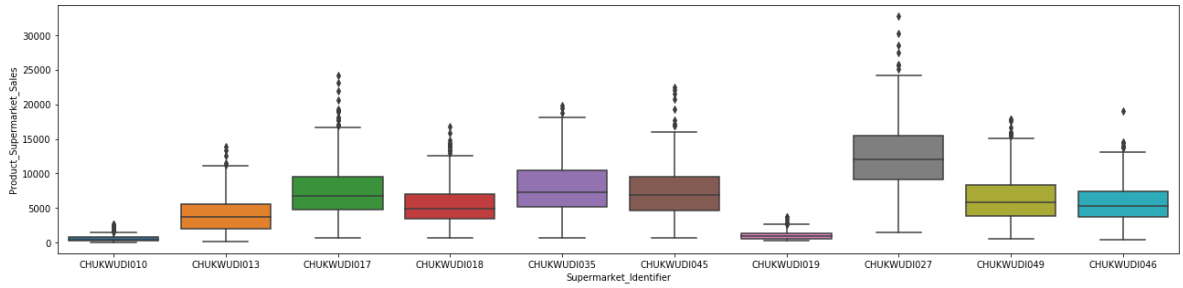

Product_Supermarket_Sales
8000
7000
6000
5000
4000
3000
2000
1000
0
Cluster 3
Cluster 2
Cluster 1
Supermarket_Location_Type

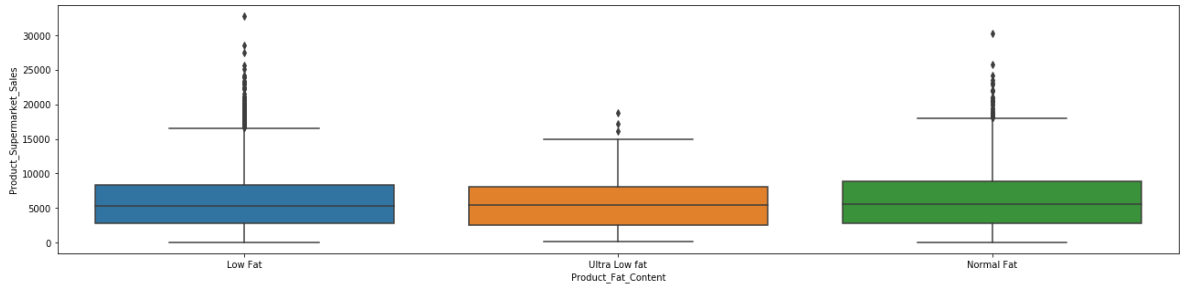

Product_Supermarket_Sales
12000
10000
8000
6000
4000
2000
0
Grocery Store
Supermarket Type1
Supermarket Type2
Supermarket Type3
Supermarket_Type

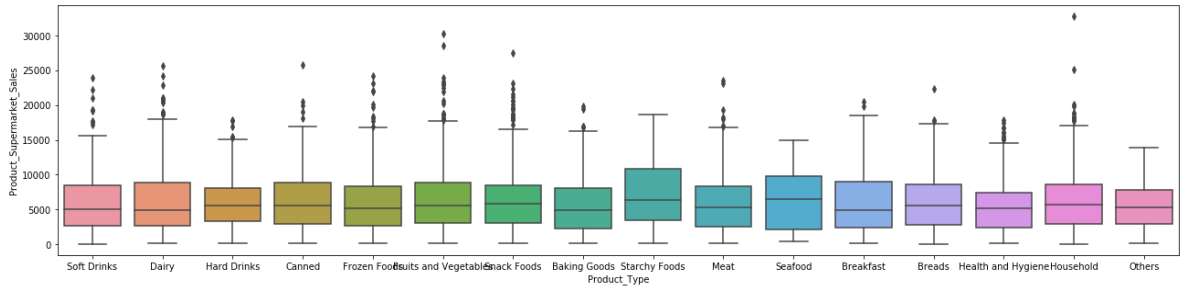
In [14]:

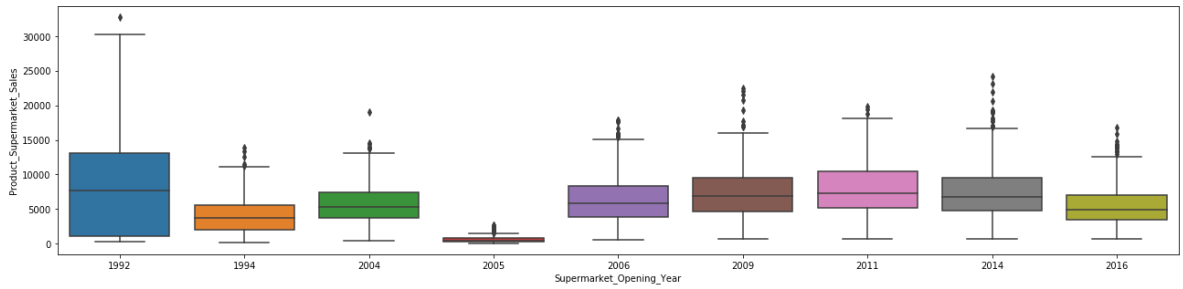
```
def plot_box(data, cols, col_y = None):
    for col in cols:
        plt.figure(figsize=(22,5))
        sns.boxplot(y=col_y, x=col, data=data)
        plt.ylabel(col_y) # Set text for the x axis
        plt.xlabel(col)# Set text for y axis
        plt.show()

plot_box(data=train,cols=cat_col,col_y='Product_Supermarket_Sales')
```

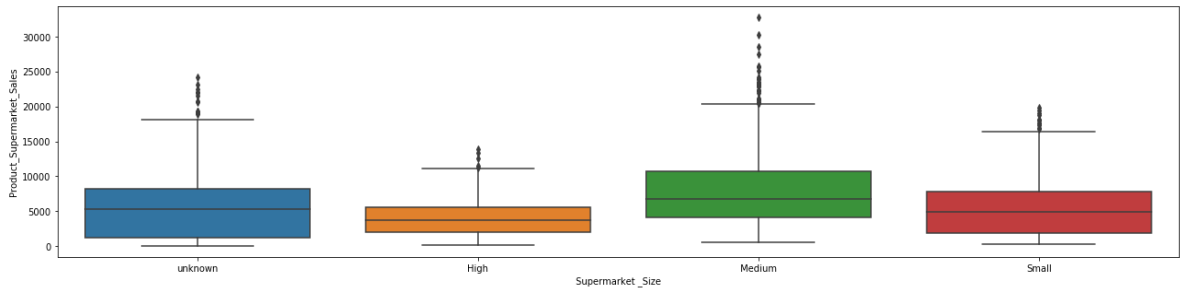
executed in 10.0s, finished 08:43:30 2019-01-29

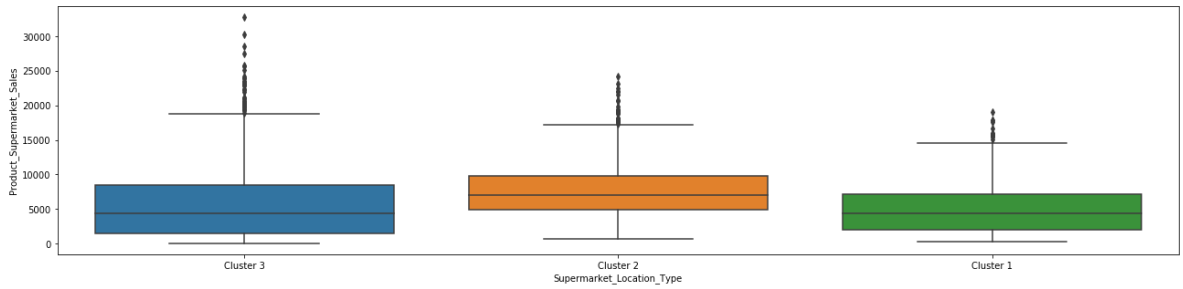


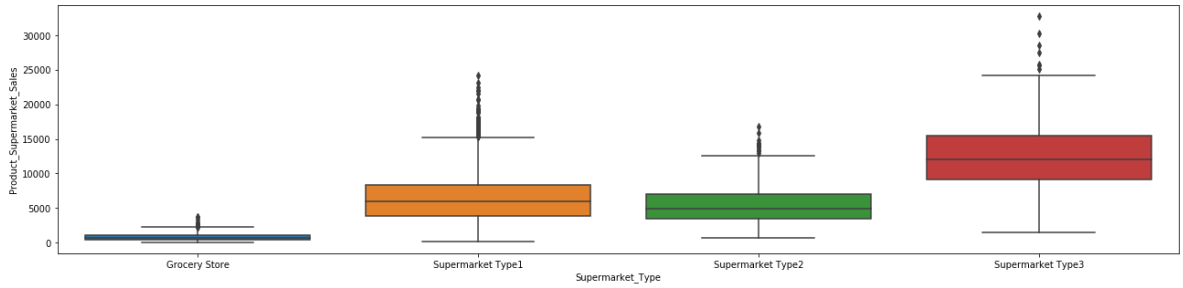








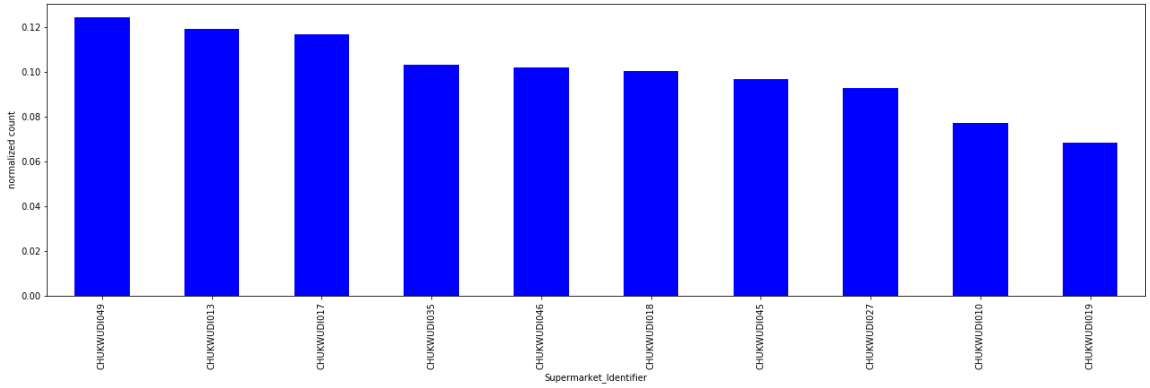


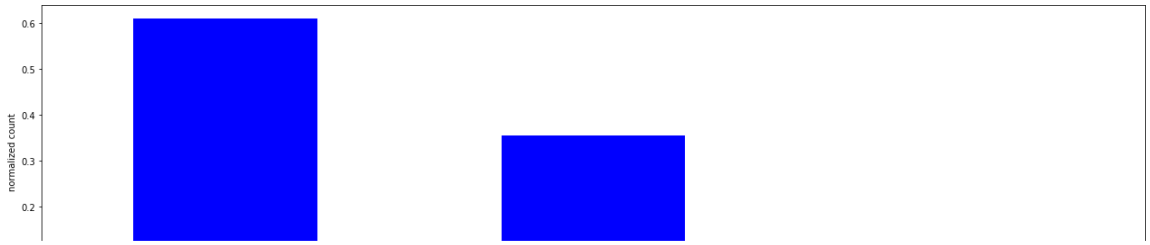


In [15]:

```
def plot_count(data, cols):
    for col in cols:
        plt.figure(figsize=(22,6))
        (train[col].value_counts()/train[col].value_counts().sum()).plot.bar(color='blue'
        plt.xlabel(col)# Set text for x axis
        plt.ylabel('normalized count')# Set text for y axis
        plt.show()

plot_count(data=train,cols=cat_col)
```

executed in 8.97s, finished 08:43:39 2019-01-29



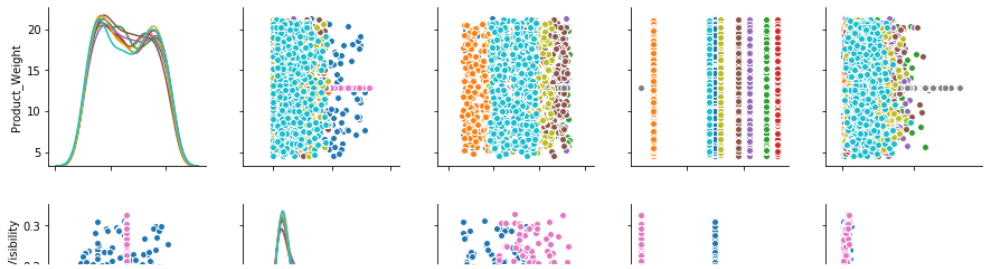


In [16]:

```
def plot_pair(data, cols):
    for col in cols:
        plt.figure(figsize=(22,5))
        sns.pairplot(data,diag_kind='kde',hue=col)
        #plt.ylabel(col_y) # Set text for the y axis
        #plt.xlabel(col)# Set text for x axis
        plt.show()

plot_pair(data=train,cols=cat_col)
```

executed in 2m 49s, finished 08:46:27 2019-01-29

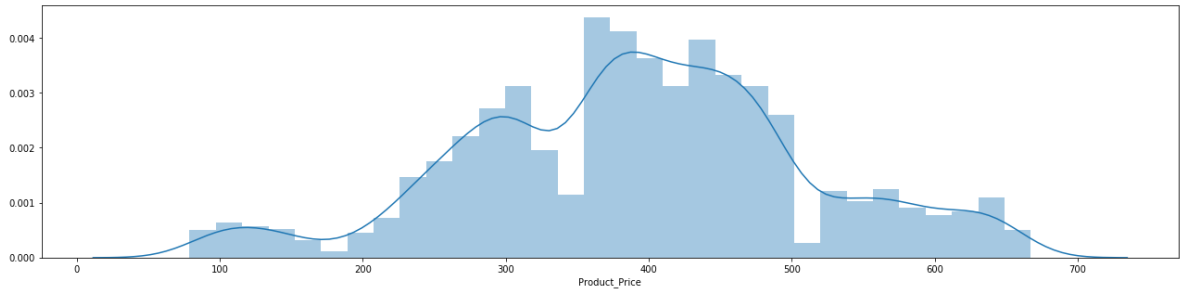
```
C:\Users\ADEBAYO\Anaconda3\lib\site-packages\statsmodels\nonparametric\kd
e.py:494: RuntimeWarning: invalid value encountered in true_divide
  binned = fast_linbin(X,a,b,gridsize)/(delta*nobs)
C:\Users\ADEBAYO\Anaconda3\lib\site-packages\statsmodels\nonparametric\kde
tools.py:34: RuntimeWarning: invalid value encountered in double_scalars
  FAC1 = 2*(np.pi*bw/RANGE)**2
C:\Users\ADEBAYO\Anaconda3\lib\site-packages\numpy\core\_methods.py:26: Ru
ntimeWarning: invalid value encountered in reduce
  return umr_maximum(a, axis, None, out, keepdims)

<matplotlib.figure.Figure at 0x223e8f40710>
```

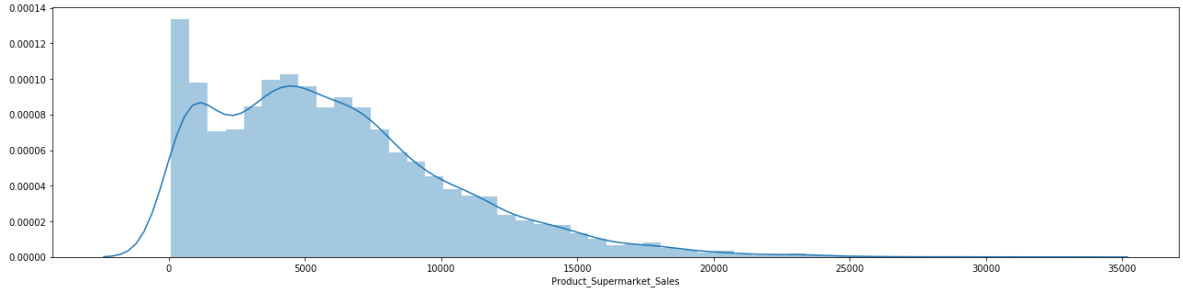


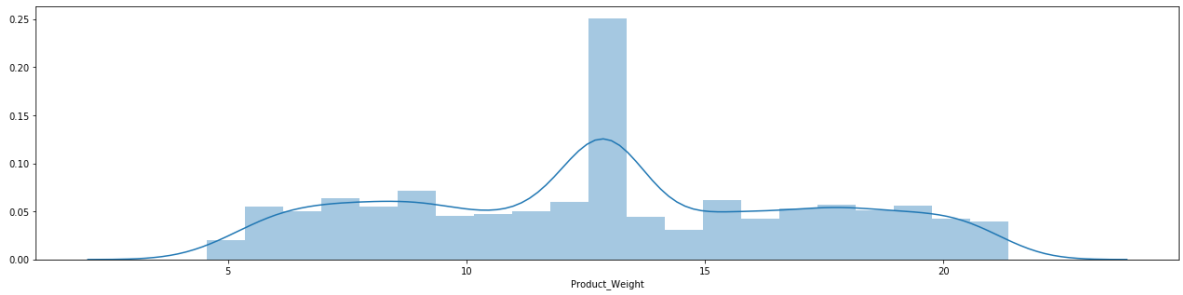
In [17]:

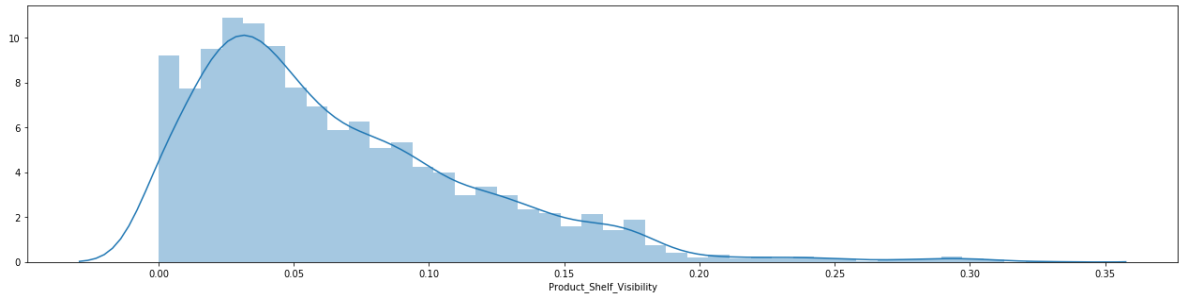
```
def plot_num(data, cols):
    for col in cols:
        plt.figure(figsize=(22,5))
        sns.distplot(data[col])
        #plt.ylabel(col_y) # Set text for the y axis
        #plt.xlabel(col)# Set text for x axis
        plt.show()

plot_num(data=train,cols=num_col)
```

executed in 3.21s, finished 08:46:31 2019-01-29









In [ ]: