In [4]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
%matplotlib inline
from matplotlib import dates
from datetime import datetime
import sklearn
import seaborn as sns
```

In [5]:
```
walmart_data = pd.read_csv('Walmart1.csv')
```

In [6]:
```
walmart_data.head()
```

Out[6]:

	Store	Date	Weekly_Sales	Holiday_Flag	Temperature	Fuel_Price	CPI	Unemployment
0	1	05-02-2010	1643690.90	0	42.31	2.572	211.096358	8.106
1	1	12-02-2010	1641957.44	1	38.51	2.548	211.242170	8.106
2	1	19-02-2010	1611968.17	0	39.93	2.514	211.289143	8.106
3	1	26-02-2010	1409727.59	0	46.63	2.561	211.319643	8.106
4	1	05-03-2010	1554806.68	0	46.50	2.625	211.350143	8.106

In [7]:
```
# Convert date to datetime format
walmart_data['Date'] =  pd.to_datetime(walmart_data['Date'])
walmart_data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 6435 entries, 0 to 6434
Data columns (total 8 columns):
 #   Column        Non-Null Count  Dtype         
---  ------        --------------  -----         
 0   Store         6435 non-null   int64         
 1   Date          6435 non-null   datetime64[ns]
 2   Weekly_Sales  6435 non-null   float64       
 3   Holiday_Flag  6435 non-null   int64         
 4   Temperature   6435 non-null   float64       
 5   Fuel_Price    6435 non-null   float64       
 6   CPI           6435 non-null   float64       
 7   Unemployment  6435 non-null   float64       
dtypes: datetime64[ns](1), float64(5), int64(2)
memory usage: 402.3 KB
```

```
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '19-02-2010' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
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C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '28-05-2010' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
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C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '18-06-2010' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '25-06-2010' in DD/MM/YYYY format. Provide format or specify inf
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rWarning: Parsing '16-07-2010' in DD/MM/YYYY format. Provide format or specify inf
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rWarning: Parsing '13-08-2010' in DD/MM/YYYY format. Provide format or specify inf
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```

```
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
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C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
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C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
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  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '15-10-2010' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '22-10-2010' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '29-10-2010' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '19-11-2010' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '26-11-2010' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '17-12-2010' in DD/MM/YYYY format. Provide format or specify inf
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C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '24-12-2010' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '31-12-2010' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '14-01-2011' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '21-01-2011' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '28-01-2011' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '18-02-2011' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
```

```
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '25-02-2011' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
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C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '18-03-2011' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
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C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '15-04-2011' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
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rWarning: Parsing '22-04-2011' in DD/MM/YYYY format. Provide format or specify inf
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rWarning: Parsing '29-04-2011' in DD/MM/YYYY format. Provide format or specify inf
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rWarning: Parsing '24-06-2011' in DD/MM/YYYY format. Provide format or specify inf
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rWarning: Parsing '26-08-2011' in DD/MM/YYYY format. Provide format or specify inf
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```

```
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '16-09-2011' in DD/MM/YYYY format. Provide format or specify inf
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rWarning: Parsing '18-11-2011' in DD/MM/YYYY format. Provide format or specify inf
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C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '20-01-2012' in DD/MM/YYYY format. Provide format or specify inf
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rWarning: Parsing '24-02-2012' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
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```

```
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '16-03-2012' in DD/MM/YYYY format. Provide format or specify inf
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C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '13-04-2012' in DD/MM/YYYY format. Provide format or specify inf
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C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '25-05-2012' in DD/MM/YYYY format. Provide format or specify inf
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C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
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C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
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  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '29-06-2012' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '13-07-2012' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '20-07-2012' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '27-07-2012' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '17-08-2012' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: Use
rWarning: Parsing '24-08-2012' in DD/MM/YYYY format. Provide format or specify inf
er_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
```

```
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: UserWarning: Parsing '31-08-2012' in DD/MM/YYYY format. Provide format or specify infer_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: UserWarning: Parsing '14-09-2012' in DD/MM/YYYY format. Provide format or specify infer_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: UserWarning: Parsing '21-09-2012' in DD/MM/YYYY format. Provide format or specify infer_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: UserWarning: Parsing '28-09-2012' in DD/MM/YYYY format. Provide format or specify infer_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: UserWarning: Parsing '19-10-2012' in DD/MM/YYYY format. Provide format or specify infer_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
C:\Users\User\anaconda3\lib\site-packages\pandas\core\tools\datetimes.py:1047: UserWarning: Parsing '26-10-2012' in DD/MM/YYYY format. Provide format or specify infer_datetime_format=True for consistent parsing.
  cache_array = _maybe_cache(arg, format, cache, convert_listlike)
```

In [8]:
```
#checking missing values
walmart_data.isnull().sum()
```

Out[8]:
```
Store           0
Date            0
Weekly_Sales    0
Holiday_Flag    0
Temperature     0
Fuel_Price      0
CPI             0
Unemployment    0
dtype: int64
```

In [9]:
```
#Splitting date column into day, month and year :
```

In [10]:
```
walmart_data["Day"]= pd.DatetimeIndex(walmart_data['Date']).day
walmart_data['Month'] = pd.DatetimeIndex(walmart_data['Date']).month
walmart_data['Year'] = pd.DatetimeIndex(walmart_data['Date']).year
walmart_data
```

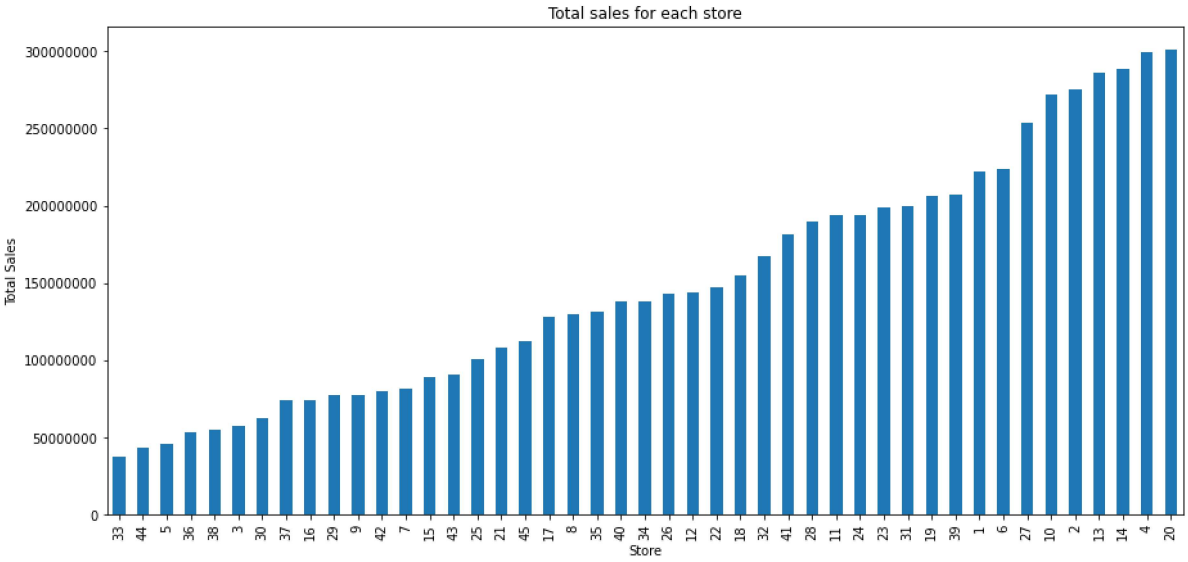
Out[10]:

	Store	Date	Weekly_Sales	Holiday_Flag	Temperature	Fuel_Price	CPI	Unemploym
0	1	2010-05-02	1643690.90	0	42.31	2.572	211.096358	8.
1	1	2010-12-02	1641957.44	1	38.51	2.548	211.242170	8.
2	1	2010-02-19	1611968.17	0	39.93	2.514	211.289143	8.
3	1	2010-02-26	1409727.59	0	46.63	2.561	211.319643	8.
4	1	2010-05-03	1554806.68	0	46.50	2.625	211.350143	8.
...	...	...	...	...	...	...	...	
6430	45	2012-09-28	713173.95	0	64.88	3.997	192.013558	8.
6431	45	2012-05-10	733455.07	0	64.89	3.985	192.170412	8.
6432	45	2012-12-10	734464.36	0	54.47	4.000	192.327265	8.
6433	45	2012-10-19	718125.53	0	56.47	3.969	192.330854	8.
6434	45	2012-10-26	760281.43	0	58.85	3.882	192.308899	8.

6435 rows × 11 columns

In [11]:
```
# 1) Which store has maximum sales ?
total_sales= walmart_data.groupby('Store')['Weekly_Sales'].sum().sort_values()
total_sales_array = np.array(total_sales)
plt.figure(figsize=(15,7))
plt.xticks(rotation=0)
plt.ticklabel_format(useOffset=False, style='plain', axis='y')
plt.title('Total sales for each store')
plt.xlabel('Store')
plt.ylabel('Total Sales')
total_sales.plot(kind='bar')
```

Out[11]:
```
<AxesSubplot:title={'center':'Total sales for each store'}, xlabel='Store', ylabel
='Total Sales'>
```

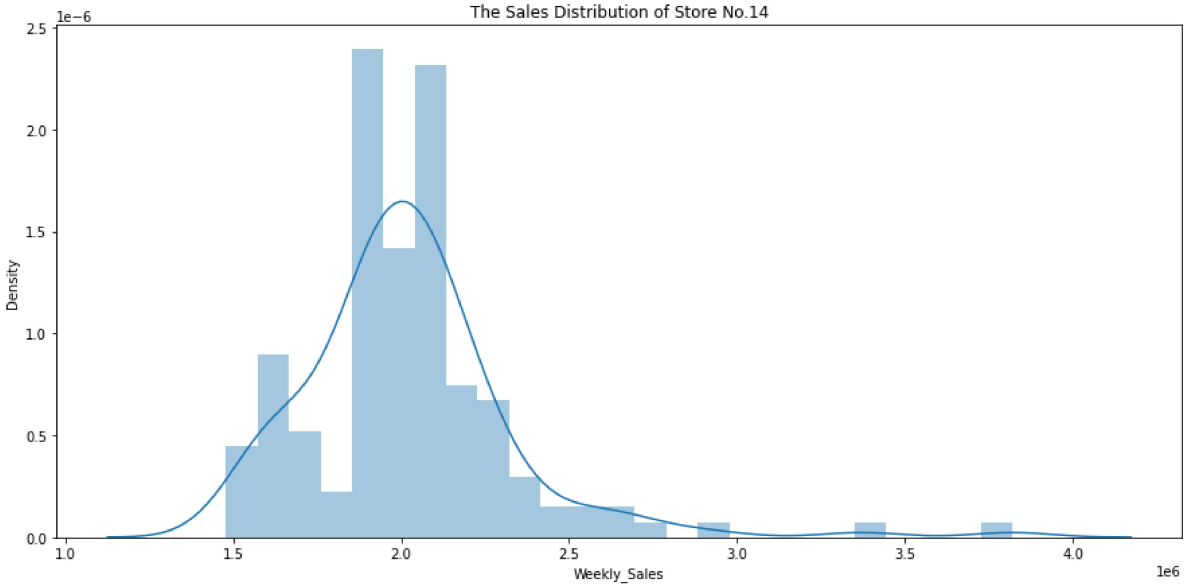


In [12]:
```
#2) Which store has maximum standard deviation?
#i.e. the sales vary a lot. Also, find out the coefficient of mean to standard dev
walmart_data_std = pd.DataFrame(walmart_data.groupby('Store')['Weekly_Sales'].std(
walmart_data_std.head(1).index[0] , walmart_data_std.head(1).Weekly_Sales[walmart_
```

Out[12]:
```
(14, 317569.9494755081)
```

In [13]:
```
# Extracting the sales data for store number 14 and plotting its distribution
plt.figure(figsize=(15,7))
sns.distplot(walmart_data[walmart_data['Store'] == walmart_data_std.head(1).index[
plt.title('The Sales Distribution of Store No.'+ str(walmart_data_std.head(1).inde
import warnings
warnings.filterwarnings('ignore')
```

```
C:\Users\User\anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWar
ning: `distplot` is a deprecated function and will be removed in a future version.
Please adapt your code to use either `displot` (a figure-level function with simil
ar flexibility) or `histplot` (an axes-level function for histograms).
  warnings.warn(msg, FutureWarning)
```

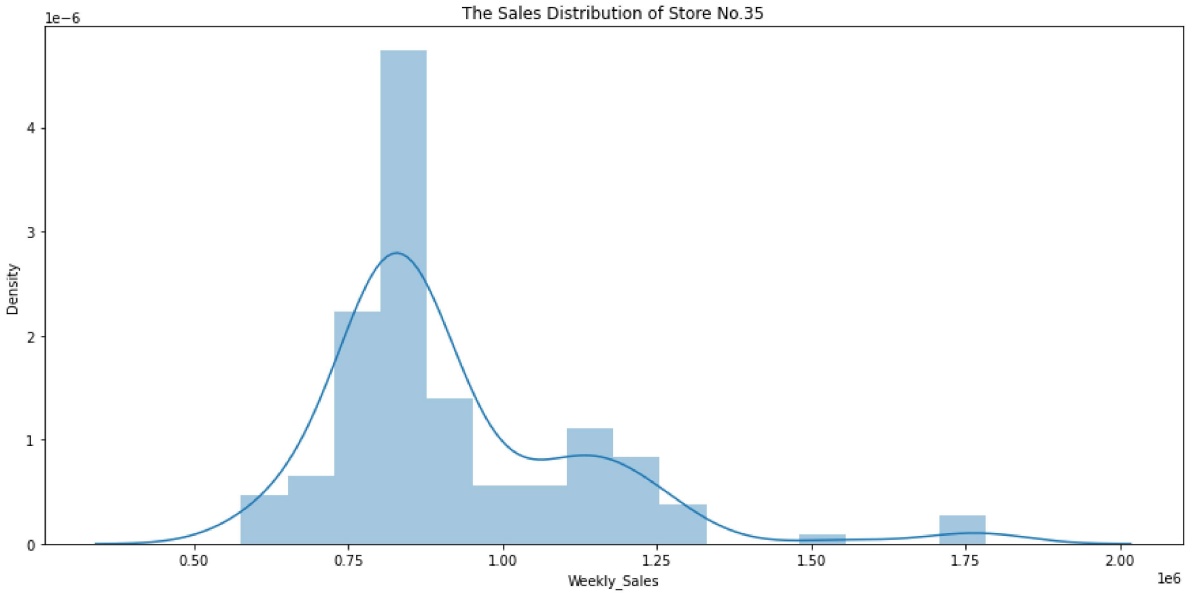


In [14]:
```
#Calculating the coefficient of mean to standard deviation
coef = pd.DataFrame(walmart_data.groupby('Store')['Weekly_Sales'].std() / walmart_
coef = coef.rename(columns={'Weekly_Sales':'Coefficient of mean to standard deviat
coef_max = coef.sort_values(by='Coefficient of mean to standard deviation',ascendi
coef_max.head(7)
```

Out[14]:

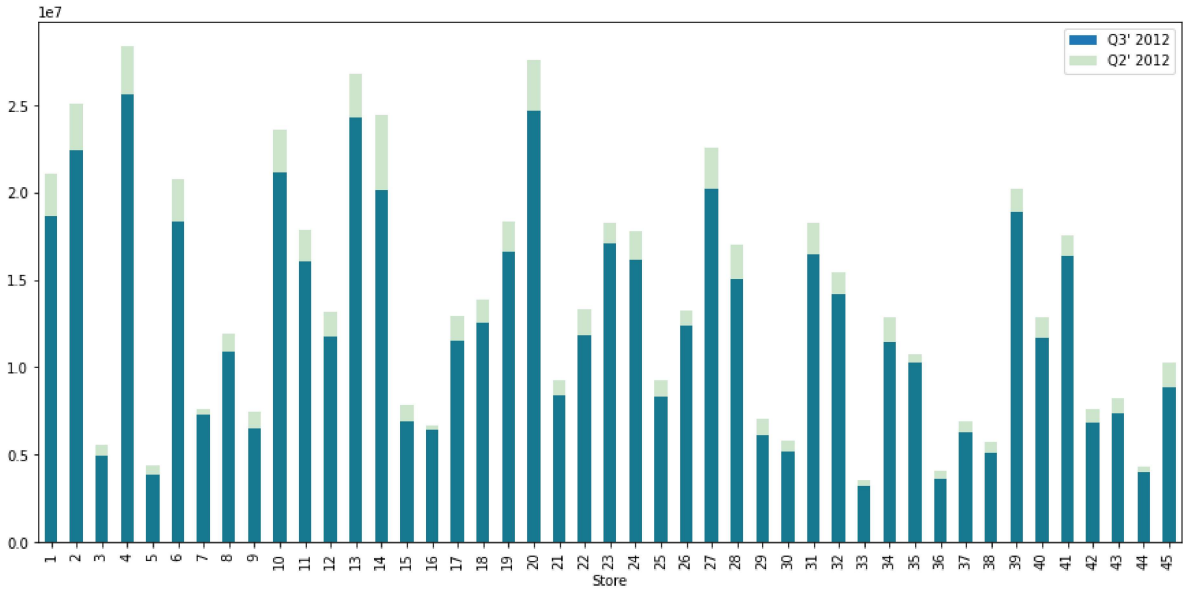
Store	Coefficient of mean to standard deviation
35	0.229681
7	0.197305
15	0.193384
29	0.183742
23	0.179721
21	0.170292
45	0.165613

In [15]:
```
# Distribution of store 35 has maximum coefficient of mean to standard deviation
plt.figure(figsize=(15,7))
sns.distplot(walmart_data[walmart_data['Store'] == coef_max.head(1).index[0]]['Wee
plt.title('The Sales Distribution of Store No.'+str(coef_max.head(1).index[0]))
import warnings
warnings.filterwarnings('ignore')
```



In [16]:
```
# Sales for second and third quarter in 2012
quarter_2_sales = walmart_data[(walmart_data['Date'] >= '2012-04-01') & (walmart_d
quarter_3_sales= walmart_data[(walmart_data['Date'] >= '2012-07-01') & (walmart_da

# Plotting the difference between sales for second and third quarterly
plt.figure(figsize=(15,7))
quarter_2_sales.plot(ax=quarter_3_sales.plot(kind ='bar'),kind='bar',color='g',alp
plt.legend(["Q3' 2012", "Q2' 2012"])
```

Out[16]:
```
<matplotlib.legend.Legend at 0x148f5473370>
```

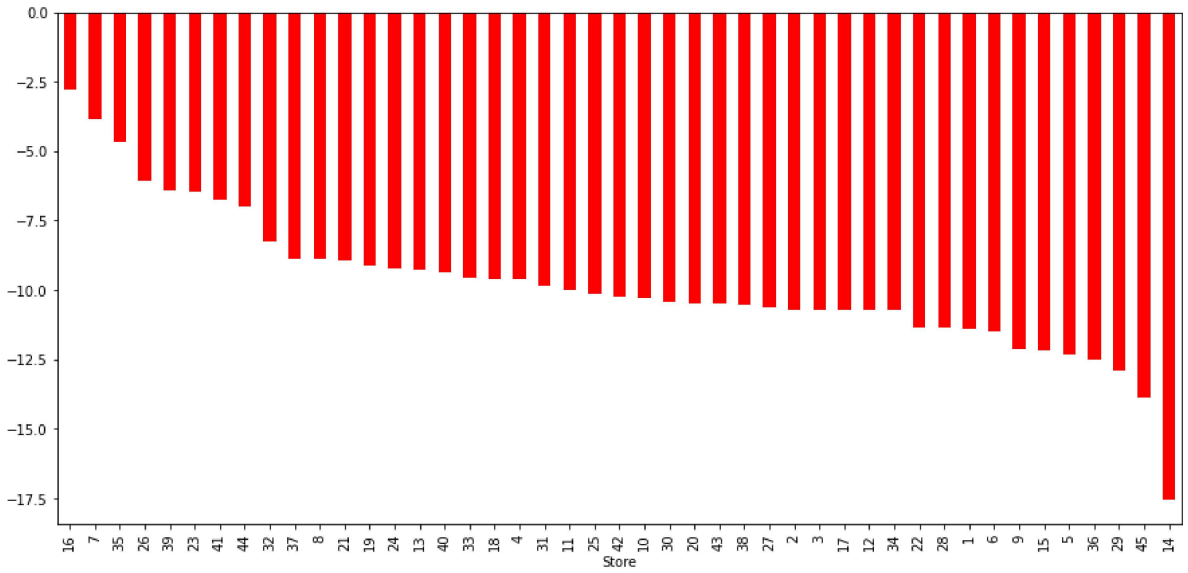


In [17]:
```
#Calculating Growth rate in Q3'2012
quarter_2_sales= walmart_data[(walmart_data['Date'] >= '2012-04-01') & (walmart_da
quarter_3_sales= walmart_data[(walmart_data['Date'] >= '2012-07-01') & (walmart_da
quarterly_growth_rate = ((quarter_3_sales - quarter_2_sales )/quarter_2_sales)*100
quarterly_growth_rate.sort_values(ascending=False).head()
```

Out[17]:
```
Store
16   -2.789294
7    -3.824738
35   -4.663086
26   -6.057624
39   -6.396875
Name: Weekly_Sales, dtype: float64
```

In [18]:
```
plt.figure(figsize=(15,7))
quarterly_growth_rate.sort_values(ascending=False).plot(kind='bar', color='red')
```

Out[18]:
```
<AxesSubplot:xlabel='Store'>
```



In [19]:
```
#4) Some holidays have a negative impact on sales.
#Find out holidays which have higher sales than the mean sales in non-holiday seas
```

In [20]:
```
#Defining holiday dates
Super_Bowl =['12-2-2010', '11-2-2011', '10-2-2012']
Labour_Day =  ['10-9-2010', '9-9-2011', '7-9-2012']
```

```
Thanksgiving =  ['26-11-2010', '25-11-2011', '23-11-2012']
Christmas = ['31-12-2010', '30-12-2011', '28-12-2012']
```

In [21]:
```
#Calculating mean sales on holidays :
Super_Bowl_Sales = (pd.DataFrame(walmart_data.loc[walmart_data.Date.isin(Super_Bow
Labour_Day_Sales = (pd.DataFrame(walmart_data.loc[walmart_data.Date.isin(Labour_Da
Thanksgiving_Sales = (pd.DataFrame(walmart_data.loc[walmart_data.Date.isin(Thanksg
Christmas_Sales = (pd.DataFrame(walmart_data.loc[walmart_data.Date.isin(Christmas)
Super_Bowl_Sales,Labour_Day_Sales,Thanksgiving_Sales,Christmas_Sales
```

Out[21]:
```
(1079127.9877037033, 1042427.2939259257, 1471273.427777778, 960833.1115555551)
```

In [22]:
```
#Calculating mean sales on non-holidays :
Non_Holiday_Sales = walmart_data[walmart_data['Holiday_Flag'] == 0 ]['Weekly_Sales
Non_Holiday_Sales
```

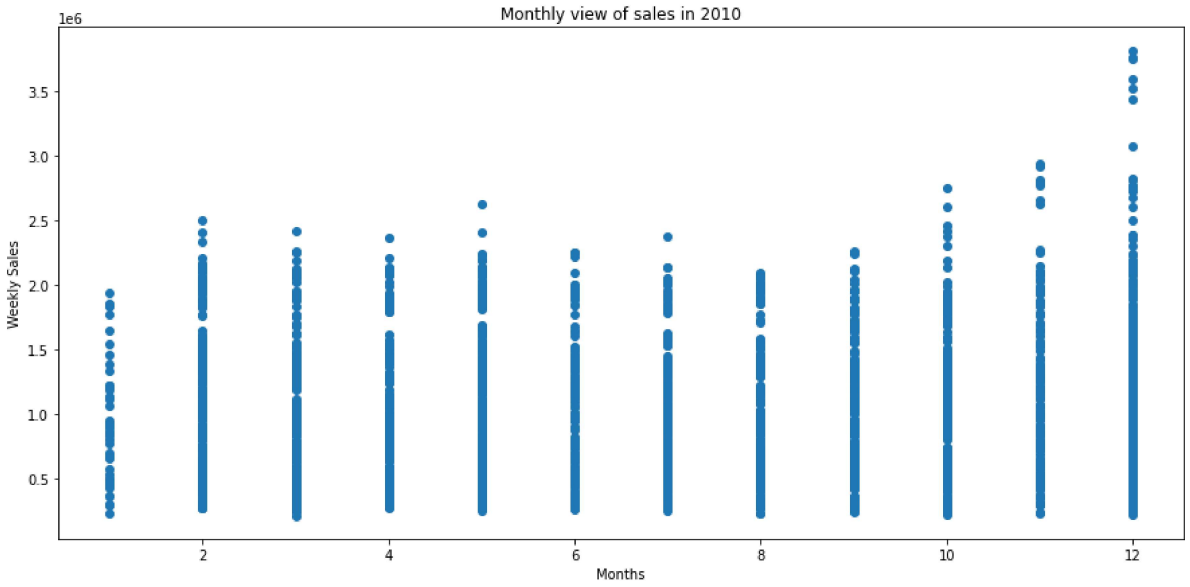
Out[22]:
```
1041256.3802088564
```

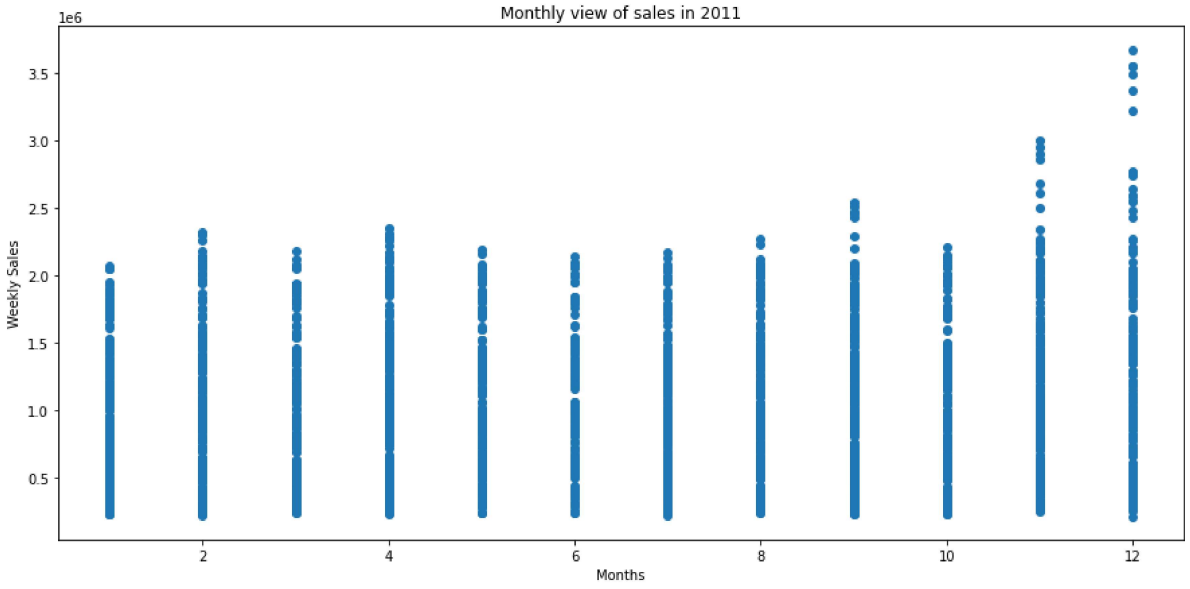
In [23]:
```
Mean_Sales = {'Super_Bowl_Sales' : Super_Bowl_Sales,
              'Labour_Day_Sales': Labour_Day_Sales,
              'Thanksgiving_Sales':Thanksgiving_Sales,
              'Christmas_Sales': Christmas_Sales,
              'Non_Holiday_Sales': Non_Holiday_Sales}
```

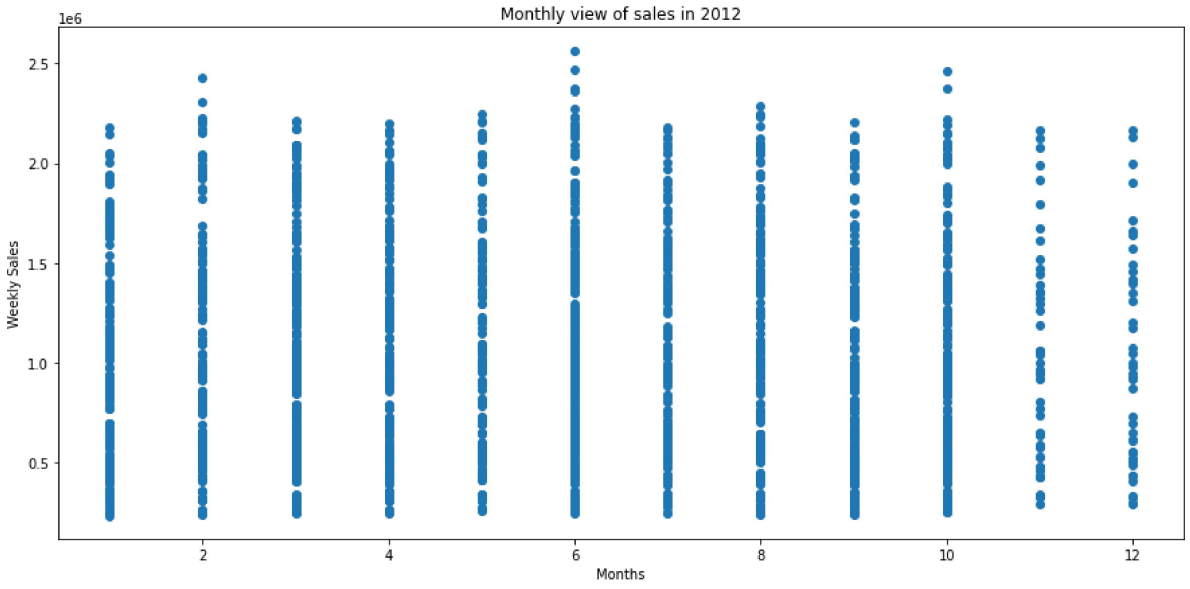
In [24]:
```
Mean_Sales
```

Out[24]:
```
{'Super_Bowl_Sales': 1079127.9877037033,
 'Labour_Day_Sales': 1042427.2939259257,
 'Thanksgiving_Sales': 1471273.427777778,
 'Christmas_Sales': 960833.1115555551,
 'Non_Holiday_Sales': 1041256.3802088564}
```

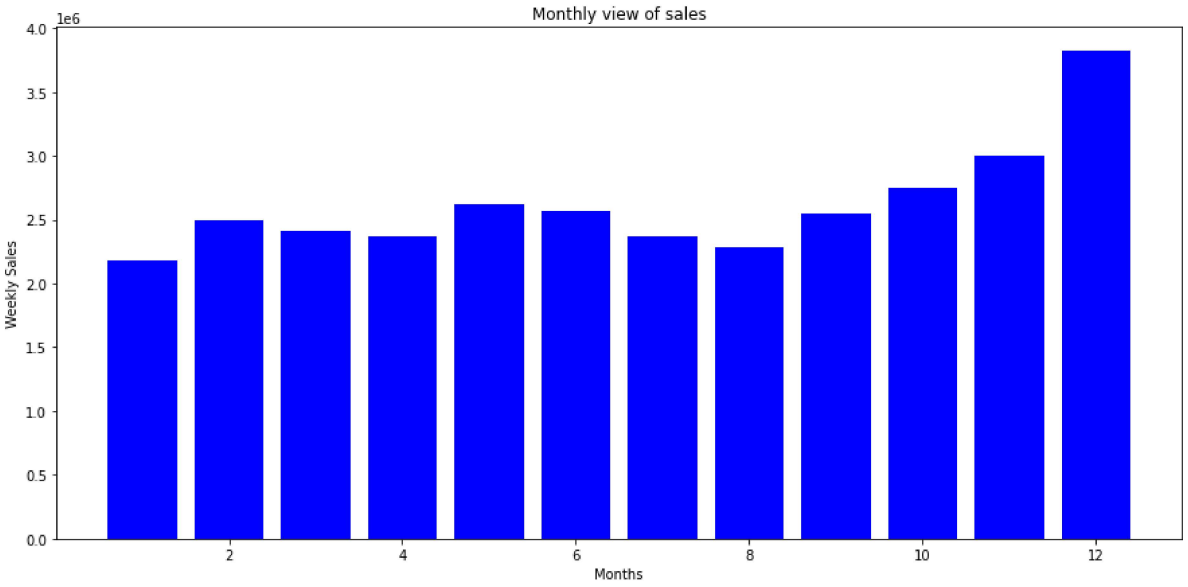
In [25]:
```
#5) Provide a monthly and semester view of sales in units and give insights.
#Year-wise Monthly Sales

plt.figure(figsize=(15,7))
plt.scatter(walmart_data[walmart_data.Year==2010]["Month"],walmart_data[walmart_da
plt.xlabel("Months")
plt.ylabel("Weekly Sales")
plt.title("Monthly view of sales in 2010")
plt.show()

plt.figure(figsize=(15,7))
plt.scatter(walmart_data[walmart_data.Year==2011]["Month"],walmart_data[walmart_da
plt.xlabel("Months")
plt.ylabel("Weekly Sales")
plt.title("Monthly view of sales in 2011")
plt.show()

plt.figure(figsize=(15,7))
plt.scatter(walmart_data[walmart_data.Year==2012]["Month"],walmart_data[walmart_da
plt.xlabel("Months")
plt.ylabel("Weekly Sales")
plt.title("Monthly view of sales in 2012")
plt.show()
```





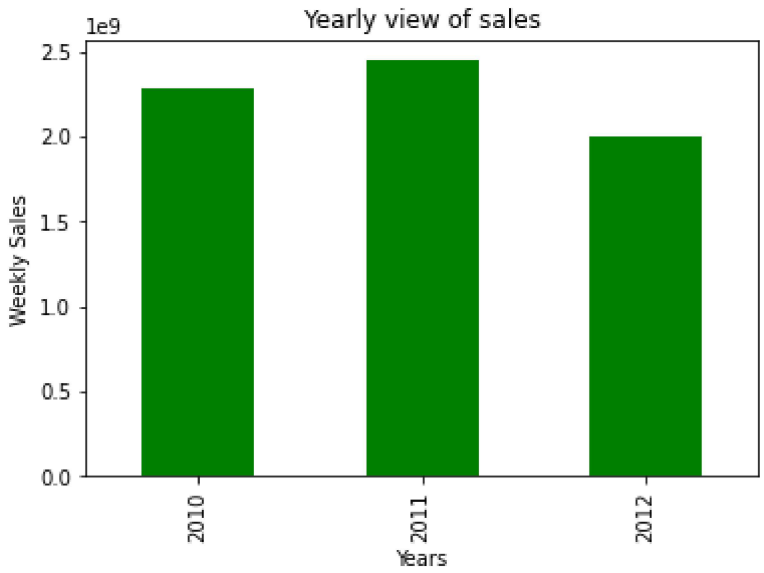


In [37]:
```
#Overall Monthly Sales
plt.figure(figsize=(15,7))
plt.bar(walmart_data["Month"],walmart_data["Weekly_Sales"], color='blue')
plt.xlabel("Months")
plt.ylabel("Weekly Sales")
plt.title("Monthly view of sales")
plt.show()
```



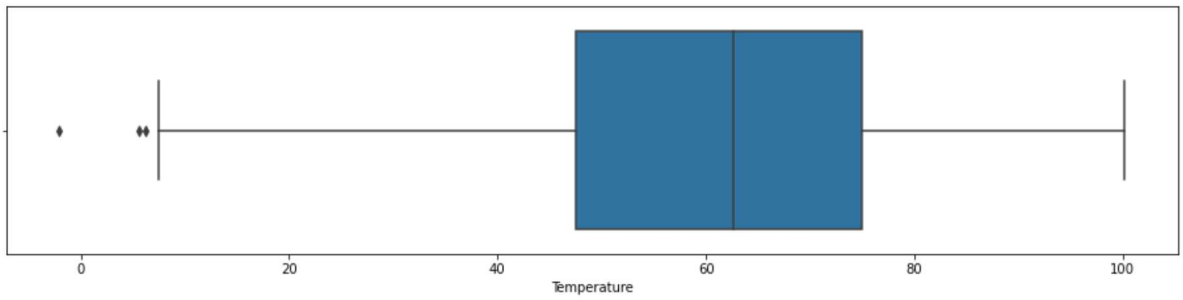
In [34]:
```
#Yearly Sales
plt.figure(figsize=(15,7))
walmart_data.groupby("Year")[["Weekly_Sales"]].sum().plot(kind='bar',legend=False,
plt.xlabel("Years")
plt.ylabel("Weekly Sales")
plt.title("Yearly view of sales")
plt.show()
```

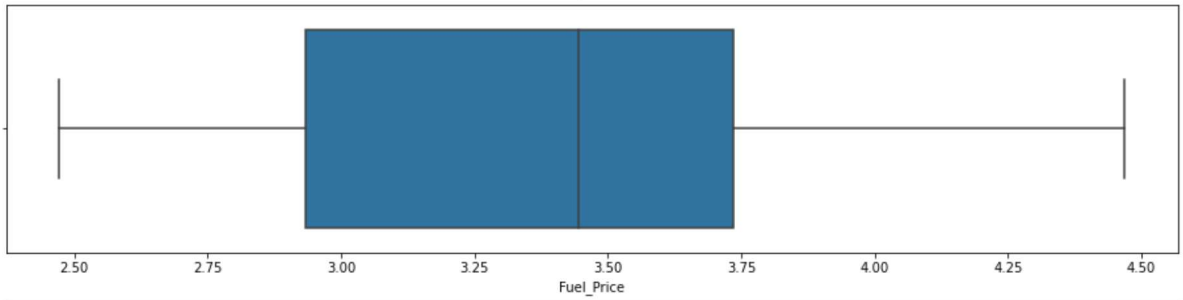
```
<Figure size 1080x504 with 0 Axes>
```

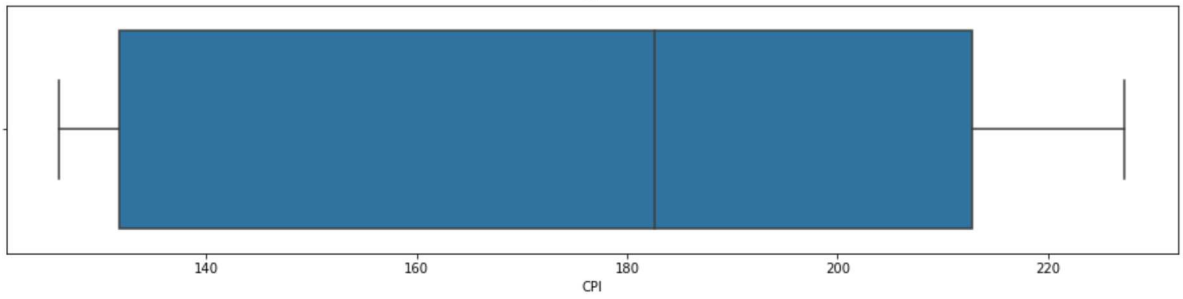


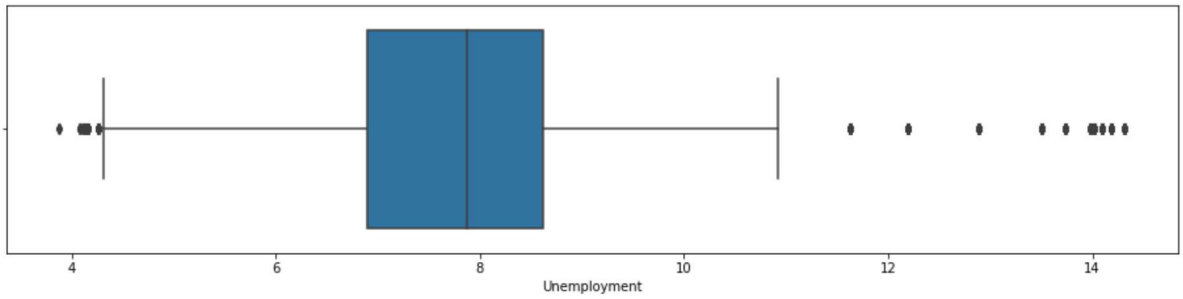
In [ ]:
```
```

In [28]:
```
#Detecting outliers :
fig, axis = plt.subplots(4,figsize=(16,16))
X = walmart_data[['Temperature','Fuel_Price','CPI','Unemployment']]
for i,column in enumerate(X):
    sns.boxplot(walmart_data[column],ax=axis[i])

import warnings
warnings.filterwarnings('ignore')
```









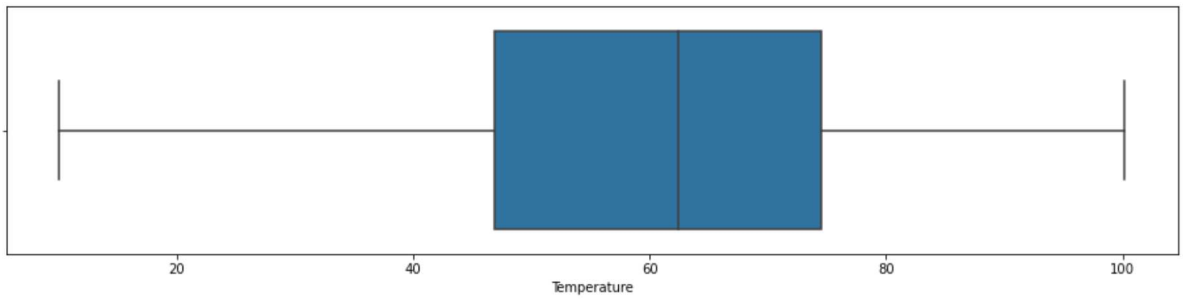
In [29]:
```
# Dropping outliers
walmart_data_clean = walmart_data[(walmart_data['Unemployment']<10) & (walmart_dat
walmart_data_clean
```

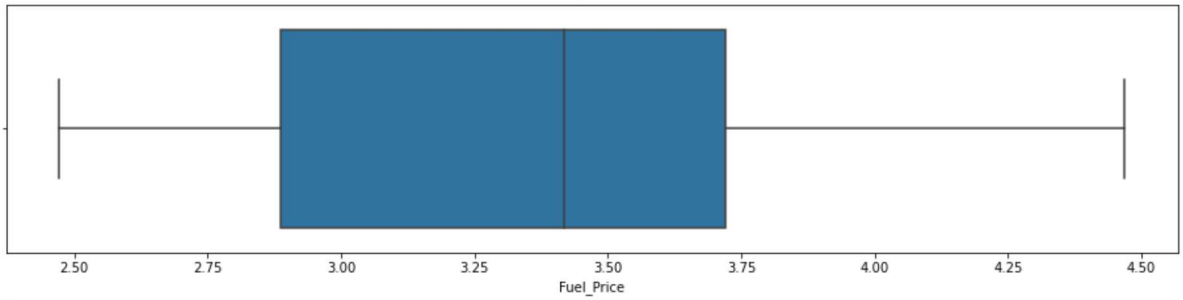
Out[29]:

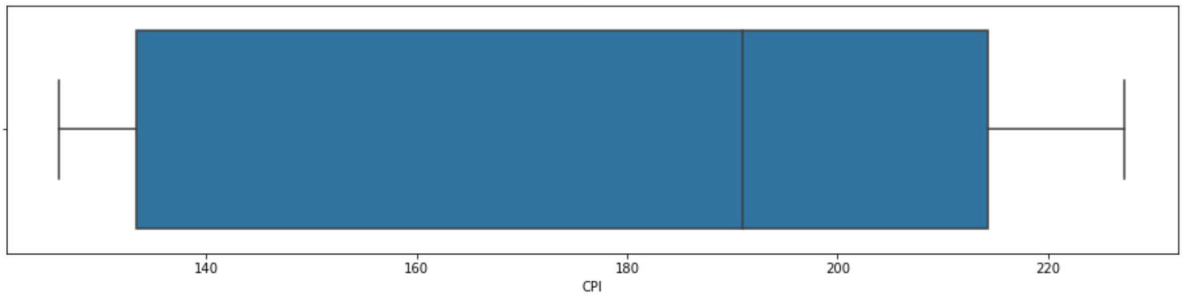
	Store	Date	Weekly_Sales	Holiday_Flag	Temperature	Fuel_Price	CPI	Unemploym
0	1	2010-05-02	1643690.90	0	42.31	2.572	211.096358	8.
1	1	2010-12-02	1641957.44	1	38.51	2.548	211.242170	8.
2	1	2010-02-19	1611968.17	0	39.93	2.514	211.289143	8.
3	1	2010-02-26	1409727.59	0	46.63	2.561	211.319643	8.
4	1	2010-05-03	1554806.68	0	46.50	2.625	211.350143	8.
...	...	...	...	...	...	...	...	
6430	45	2012-09-28	713173.95	0	64.88	3.997	192.013558	8.
6431	45	2012-05-10	733455.07	0	64.89	3.985	192.170412	8.
6432	45	2012-12-10	734464.36	0	54.47	4.000	192.327265	8.
6433	45	2012-10-19	718125.53	0	56.47	3.969	192.330854	8.
6434	45	2012-10-26	760281.43	0	58.85	3.882	192.308899	8.

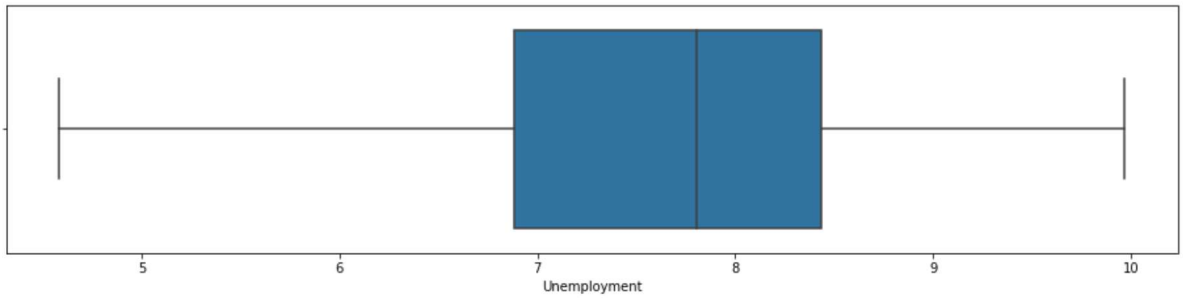
5658 rows × 11 columns

In [30]:
```
#Checking data for outliers
fig, axis = plt.subplots(4,figsize=(16,16))
X = walmart_data_clean[['Temperature','Fuel_Price','CPI','Unemployment']]
for i,column in enumerate(X):
    sns.boxplot(walmart_data_clean[column], ax=axis[i])

import warnings
warnings.filterwarnings('ignore')
```





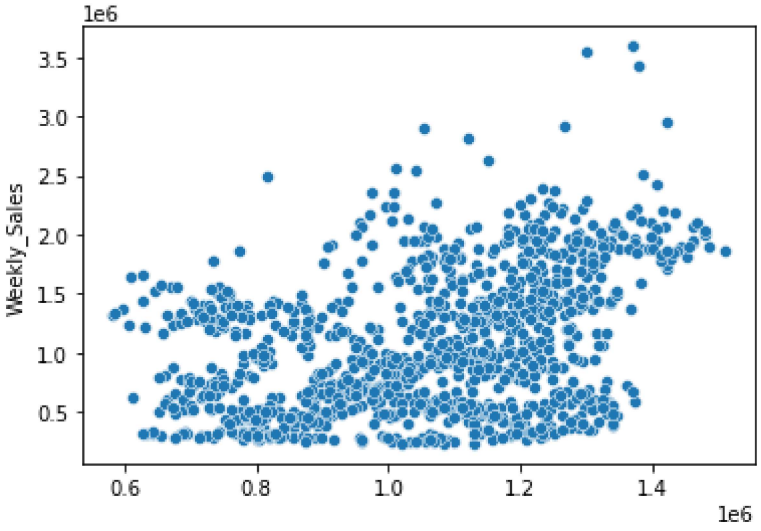




In [31]:
```
# Linear Regression :
from sklearn.model_selection import train_test_split
from sklearn import metrics
from sklearn.linear_model import LinearRegression
X = walmart_data_clean[['Store','Fuel_Price','CPI','Unemployment','Day','Month','Y
Y = walmart_data_clean['Weekly_Sales']
X_train, X_test, Y_train, Y_test = train_test_split(X,Y,test_size=0.2)
```

In [32]:
```
print('Linear Regression:')
print()
reg = LinearRegression()
reg.fit(X_train, Y_train)
Y_pred = reg.predict(X_test)
print('Accuracy:',reg.score(X_train, Y_train)*100)
print('Mean Absolute Error:', metrics.mean_absolute_error(Y_test, Y_pred))
print('Mean Squared Error:', metrics.mean_squared_error(Y_test, Y_pred))
print('Root Mean Squared Error:', np.sqrt(metrics.mean_squared_error(Y_test, Y_pre
sns.scatterplot(Y_pred, Y_test)

import warnings
warnings.filterwarnings('ignore')
```

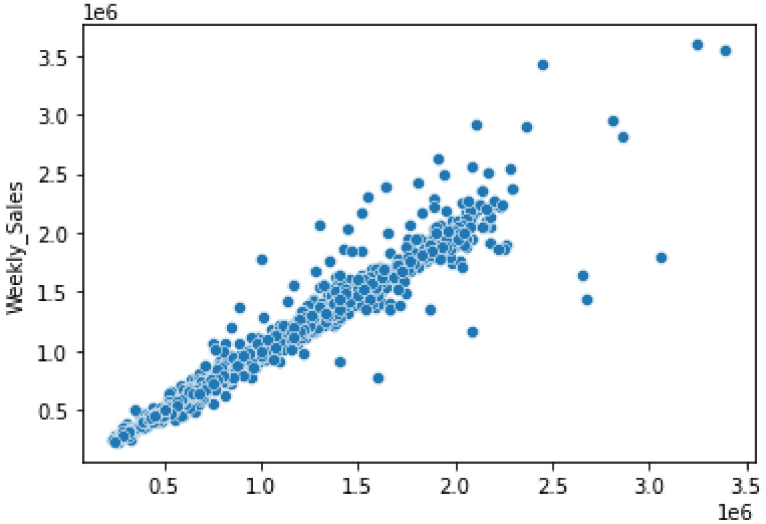
```
Linear Regression:

Accuracy: 12.912495465283225
Mean Absolute Error: 447699.1934558603
Mean Squared Error: 290428546982.4188
Root Mean Squared Error: 538914.2297086047
```



In [33]:
```
# Random Forest Regressor
from sklearn.ensemble import RandomForestRegressor
print('Random Forest Regressor:')
print()
rfr = RandomForestRegressor()
rfr.fit(X_train,Y_train)
Y_pred = rfr.predict(X_test)
print('Accuracy:',rfr.score(X_test, Y_test)*100)
print('Mean Absolute Error:', metrics.mean_absolute_error(Y_test, Y_pred))
print('Mean Squared Error:', metrics.mean_squared_error(Y_test, Y_pred))
print('Root Mean Squared Error:', np.sqrt(metrics.mean_squared_error(Y_test, Y_pre
sns.scatterplot(Y_pred, Y_test)
```

```
Random Forest Regressor:

Accuracy: 94.44989146877877
Mean Absolute Error: 67619.70886448765
Mean Squared Error: 18498254603.55974
Root Mean Squared Error: 136008.28873109072
```

Out[33]:
```
<AxesSubplot:ylabel='Weekly_Sales'>
```



In [ ]: