**2. Feature Analysis:**

### **2.1 Seasonality Summary**

* + 1. Sales by year:
* The year trend chart shows that 2014 total sales is higher than. 2015 only contains 10-month data, so it is not comparable with the other 2 years.
* the judging from the plots, the Median, 1st quantile and 3rd quantile, as well as minimum and maximum for the daily sales for unique item for 2014 and 2015 are higher than 2013.

2.1.2 Sales by Year and Month

* Both the Bar Chart and the Boxplot show that the Total Sales in the month of November and December are higher compared to other months.

2.1.3 Sales by Day

* Both the Bar Chart and the Boxplot show that the day 19 and day 30 have highest total sales.

### **2.2 Sales and Volume Distribution by Shop**

* The Bar Chart shows that Shop ID 31, 25, 42 has the top 3 total sales.
* The box plot suggests that Shop ID 9 and Shop ID 20 has the highest daily sales for single item
* The Bar Chart for volume shows that Shop ID 31, 25, 54 has the top 3 total sales volume.

**2.3 Sales and Volume Distribution by item category**

* The Bar Chart shows that Item\_catogory\_id 19, 20 has outstanding high total sales.
* The box plot shows that Item\_catogory\_id 12 and 16 has the highest daily sales for single item
* The Bar Chart shows that Item\_catogory\_id 30, 40 has outstanding high total Sales Volume.

### **2.4 Shops and Item Variety**

* The more variety of items id, the more the total sales
* The trend for item category is not so obvious, sometimes the more variety of item category ID, the less total sales.

**2.5 Scatter plots for each variable against the Sales**

This suggests similar Trend as above.