Exploratory Data Analysis

Initial Questions:

1. What is the trend in number of orders irrespective of center and meal?
2. What is the trend in number of orders with respect to meal?
3. What is the trend in number of orders with respect to center?
4. What is the impact of promotional activities like email and homepage plays on number of orders?
5. Are there any correlation between checkout_price, base_price with number of orders?

Trend in number of orders irrespective of center and meal

- **Weekly Trend**
    - It was found that week 62 had lowest orders while week 5 and week 48 had highest orders.
    - After further analysis, there was hugh difference in the promotional activity by emails for week 62 compared to week 48 and week 5.
- **Yearly Trend**
    - Data is not sufficient to analyse the yearly trend in number of orders.
- **Monthly Trend**
    - It was found that month 2 had highest orders and month 9 had the lowest orders.
- **Week in Month Trend**
    - It was found that start and end of the month has highest orders as compared to the mid of month.

Trend in number of orders with respect to center

Trend in number of orders were analysed with respect to center's metadata like city code, region code, center type and operation area.

Below are the findings from the same:

- Centers with center type TYPE_B get more orders than centers with center type TYPE_A and TYPE_C
- Centers with region code 35 has lowest orders
- There are fluctuations in the number of orders for almost all regions
- Orders increased with increase in operating areas

Trend in number of orders with respect to meal

Trend in number of orders were analysed with respect to meal's metadata like cuisine and category.

Below are the findings from the same:

- Orders for Italian meals and Beverages are always high
- There are fluctuations in the number of orders for Indian meals, Rice Bowl and Sandwich.
- Orders for Salad increased after week 18

Promotional Activities

Below were the initial questions to identify the impact of promotional activity on number of orders

1. Does promotion by email results in increase in number of orders?
2. Does promotion in homepage results in increase in number of orders?
3. Since, there can be activity in any one way, which promotional activity has higher impact on number of orders?

Promotion by emails

The answer to this question was found using below hypothesis test

Parameter	**Value**
Null Hypothesis	The difference between the mean of number of orders with email promotion and without email promotion is less than or equal to zero.
Alternate Hypothesis	The difference between the mean of number of orders with email promotion and without email promotion is greater than zero.
Alpha	0.05 (left-side)
P-value	< 0.01
Hypothesis to Accept	Alternate Hypothesis
Conclusion	**Promotion Activity by emails does increase the number of orders.**

Promotion in homepage

The answer to this question was found using below hypothesis test

Parameter	**Value**
Null Hypothesis	The difference between the mean of number of orders with homepage promotion and without homepage promotion is less than or equal to zero.
Alternate Hypothesis	The difference between the mean of number of orders with homepage promotion and without homepage promotion is greater than zero.
Alpha	0.05 (left-side)
P-value	< 0.01
Hypothesis to Accept	Alternate Hypothesis
Conclusion	**Promotion Activity in homepage does increase the number of orders**

Homepage vs Email

The answer to this question was found using below hypothesis test

Parameter	**Value**
Null Hypothesis	The difference between the mean of number of orders with homepage promotion and without homepage promotion is less than or equal to zero.
Alternate Hypothesis	The difference between the mean of number of orders with homepage promotion and without homepage promotion is greater than zero.
Alpha	0.05 (left-side)
P-value	0.0001
Hypothesis to Accept	Alternate Hypothesis
Conclusion	**Promotion Activity in homepage has more impact than emails on increase in number of orders**

Note: This is only in case there is any one activity.

Correlation between price and number of orders

After analysing the correlation between every continuous variable with each other, below are the findings:

- The checkout price and base price has high positive correlation with each other
- Both prices also have negative correlation with number of orders, which make sense
- The discount, which was derived from both prices, has low positive correlation with number of orders