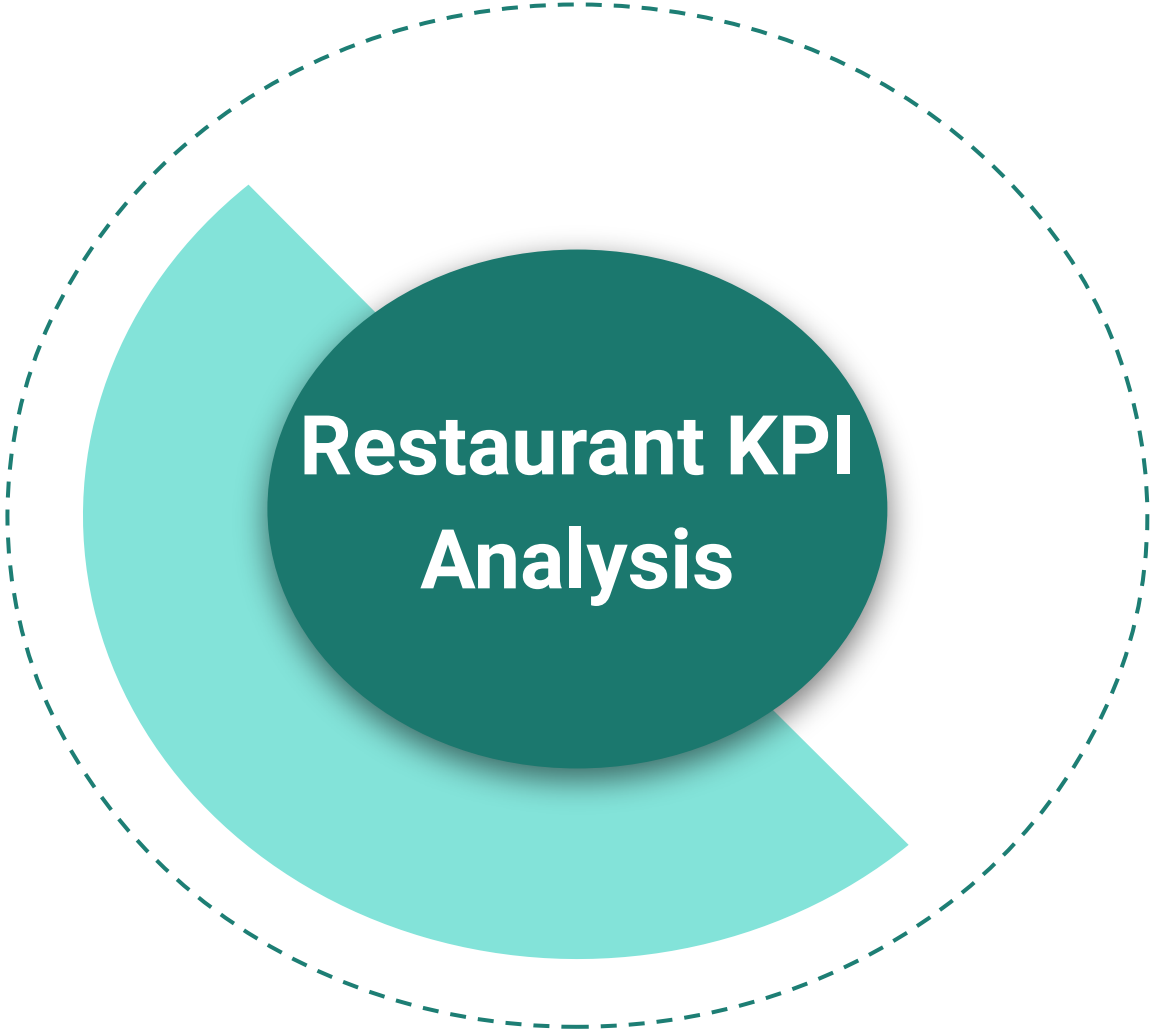

Restaurant KPI
Analysis

What are KPIs?

Key performance indicators (KPIs) are measurable values that track the performance of a business.

Why are KPIs important for restaurants?

KPIs can help restaurants identify areas for improvement, track their progress over time, and compare their performance to other businesses.

What are the goals of this analysis?

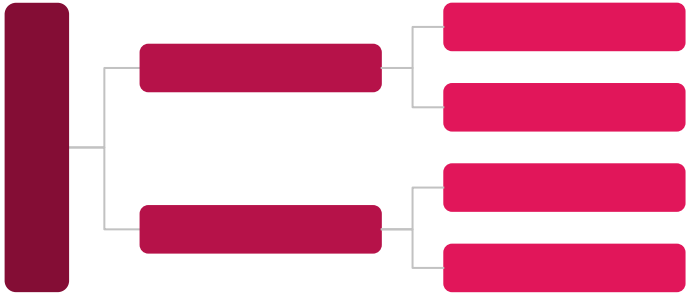
- To identify the key factors that predict sales for restaurants.
- To offer restaurant owners a ranked list of these factors to help them maximize profitability when opening a new store.

Data set Overview

The data set contains data for 132 restaurants,and 10 metrics of analysis:

The metrics are as follows:

- Total sales
- Sales percentage change
- Error rate (-ve)
- Marketing percentage (+ve)
- Marketing ROI (+ve)
- Rating (+ve)
- Review count (+ve)
- Downtime (-ve)



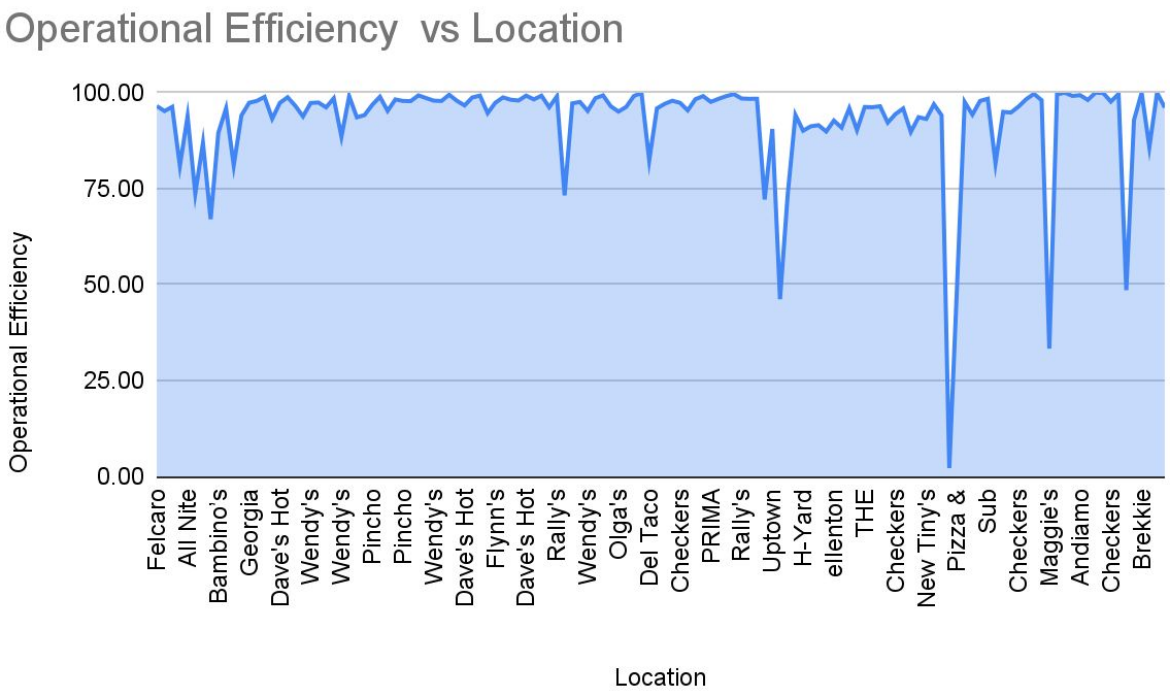
Correlation analysis

Correlation Table	Total Sales	Sales Percentage Change	Error rate (-ve)	Marketing Percentage (+ve)	Marketing ROI (+ve)	Rating (+ve)	Review Count (+ve)	Downtime (-ve)
Total Sales	1.00	-0.04	-0.20	-0.05	0.19	-0.32	0.96	-0.15
Sales Percentage Change	-0.04	1.00	0.13	0.05	0.21	0.07	-0.05	0.02
Error rate (-ve)	-0.20	0.13	1.00	0.18	0.12	0.04	-0.18	0.46
Marketing Percentage (+ve)	-0.05	0.05	0.18	1.00	0.52	0.06	-0.07	0.30
Marketing ROI (+ve)	0.19	0.08	0.12	0.52	1.00	-0.06	0.10	0.00
Rating (+ve)	-0.32	0.07	0.04	0.06	-0.06	1.00	-0.27	0.06
Review Count (+ve)	0.96	-0.05	-0.18	-0.07	0.10	-0.27	1.00	-0.15
Downtime (-ve)	-0.15	0.02	0.46	0.30	0.00	0.06	-0.15	1.00

Key takeaways:

- Review count is the strongest predictor of total sales.
- Marketing ROI is a good predictor of both total sales and sales percentage change.
- Error rate is a good predictor of downtime.
- Downtime is negatively correlated with all other metrics except error rate.

Operational efficiency

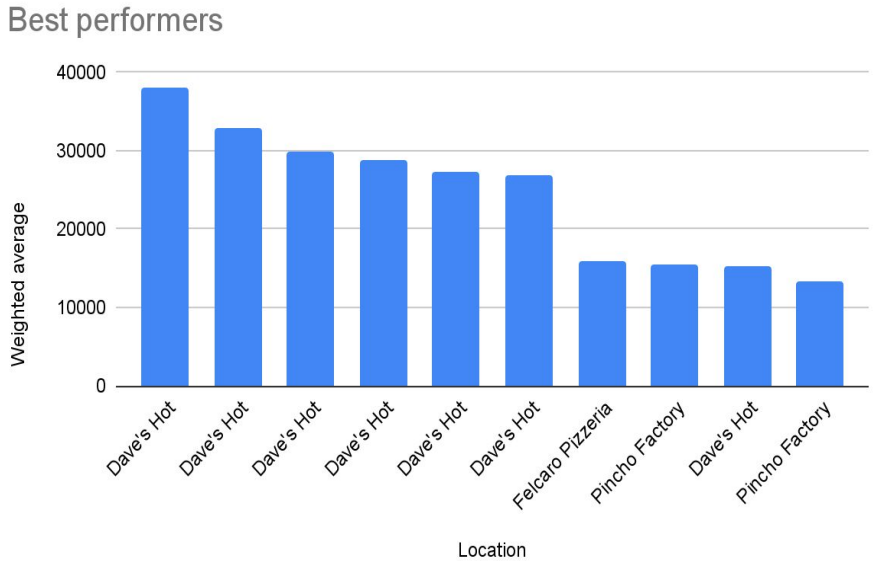


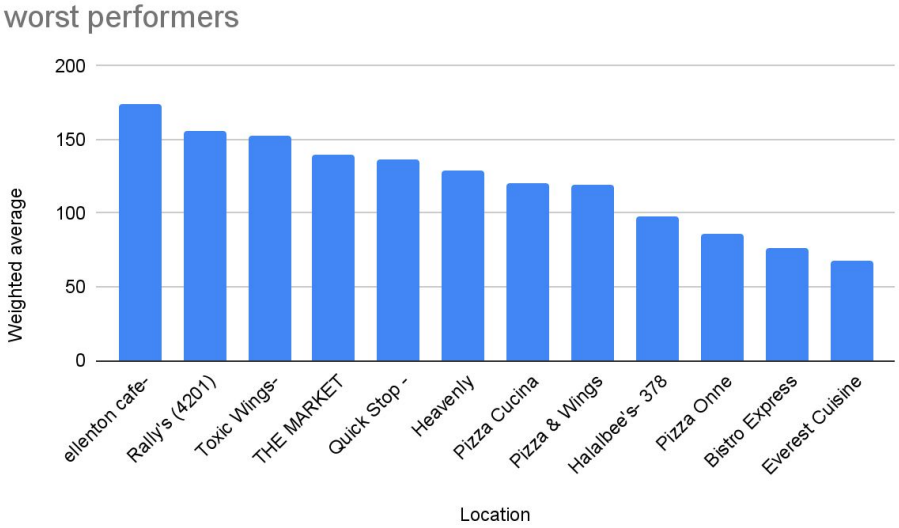
Operational efficiency = 100-error rate-downtime

- We can see few restaurants have very low operation efficiency due to their high downtime and error rate

Performance ranking

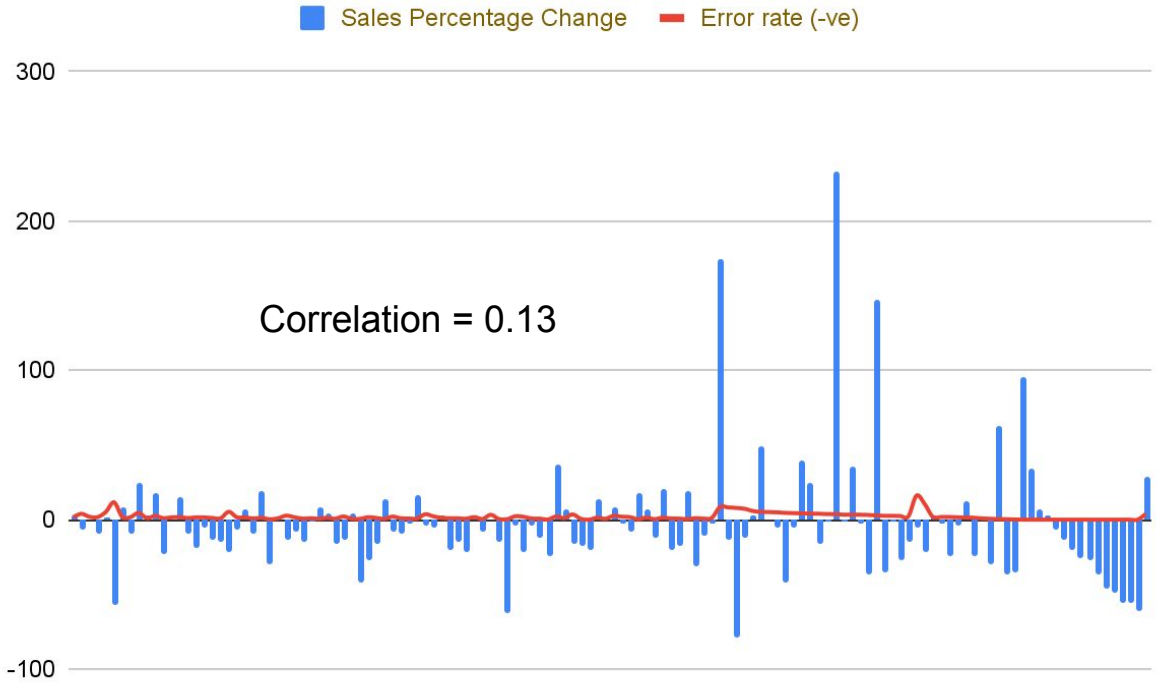
Weighted average = 0.314*Total Sales 0.223*Sales percentage+0.094*error rate+0.117*Downtime+0.102*rating+0.046* count+0.019*Marketing percentage+0.087*MArketing ROI





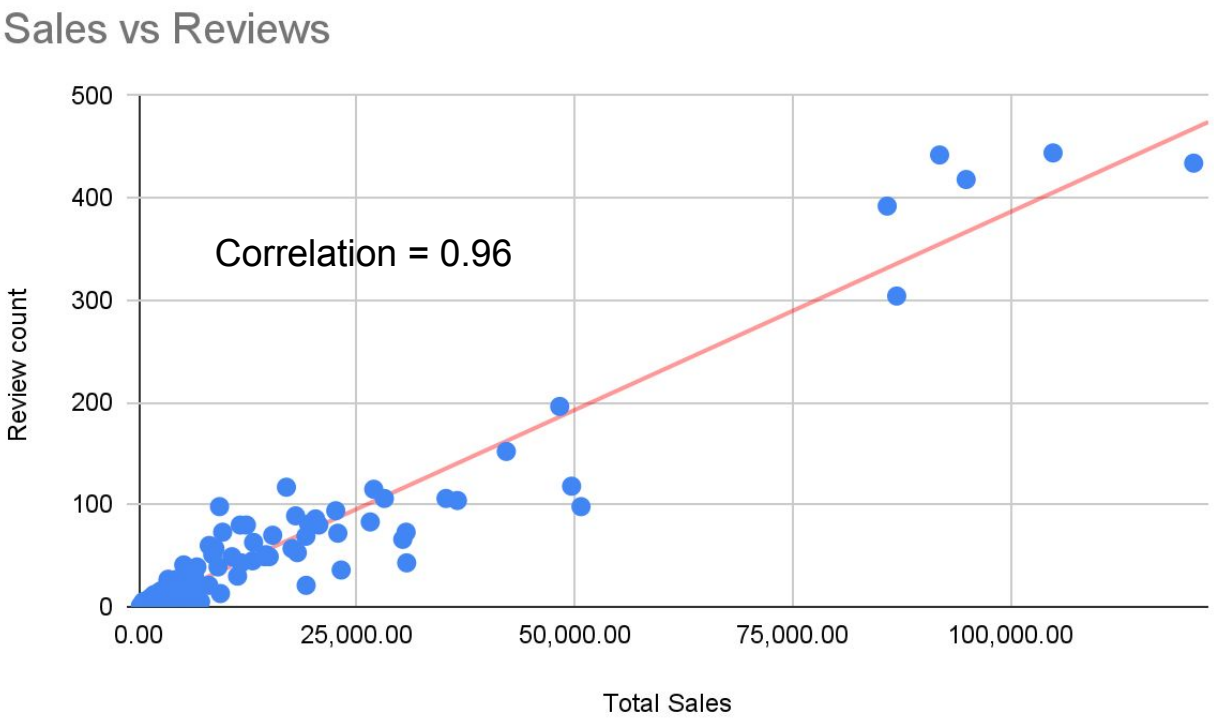
I compared the best and worst performers based on the weighted average of their performance.

Growth vs. error rate



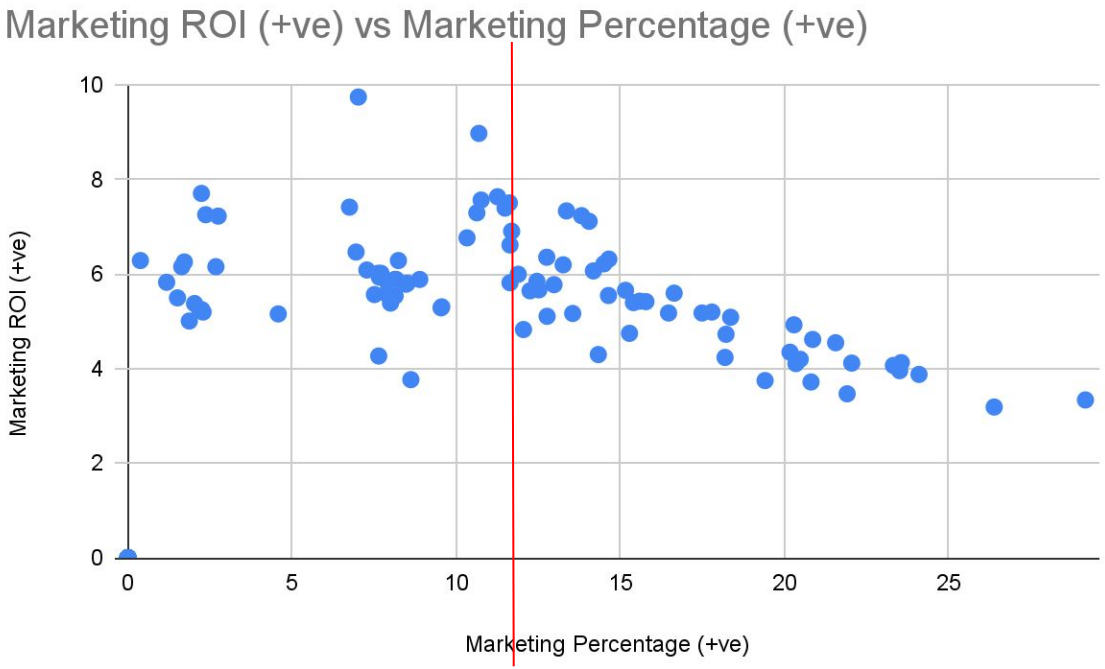
- Although the error rate increases with sales percentage change, the magnitude of the increase is not significant.

Sales to review ratio



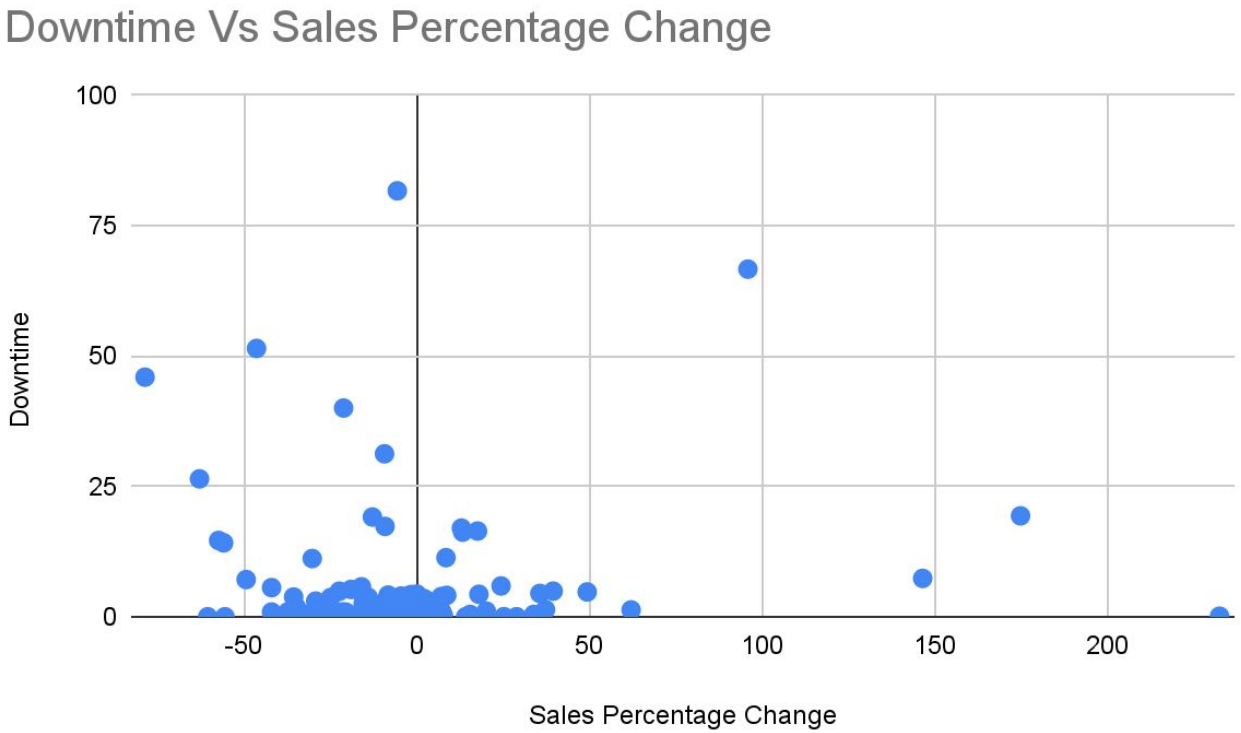
- The positive correlation coefficient and upward trend line indicate a linear relationship between review count and total sales. This suggests that an increase in review count can be expected to result in an increase in total sales.

Impact of marketing



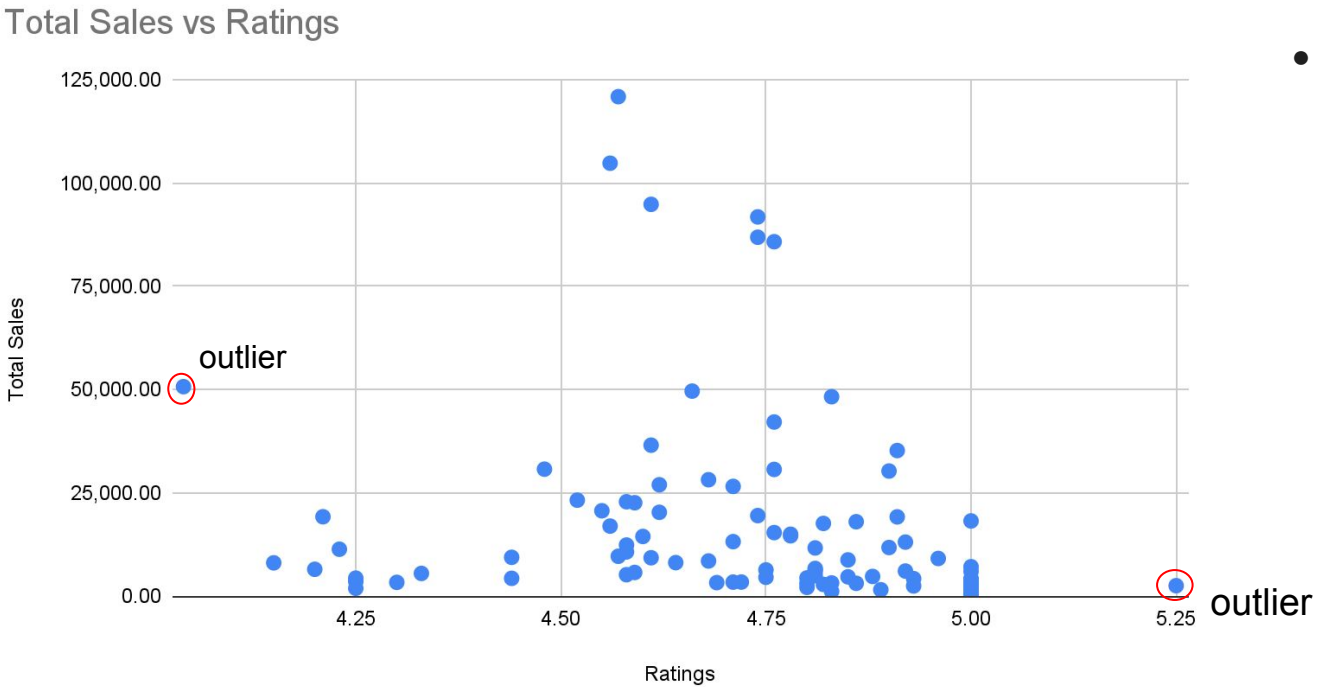
- The graph shows that a large marketing budget does not necessarily lead to a better return on investment (ROI). In fact, there are several cases where a marketing budget of less than 5%-10% has resulted in a very high ROI.
- The points on the red line represent companies that have spent the same percentage on marketing, but have achieved varying returns on investment (ROI). This suggests that the quality of marketing campaigns plays a more significant role in determining ROI than the amount of money spent.

Downtime impact



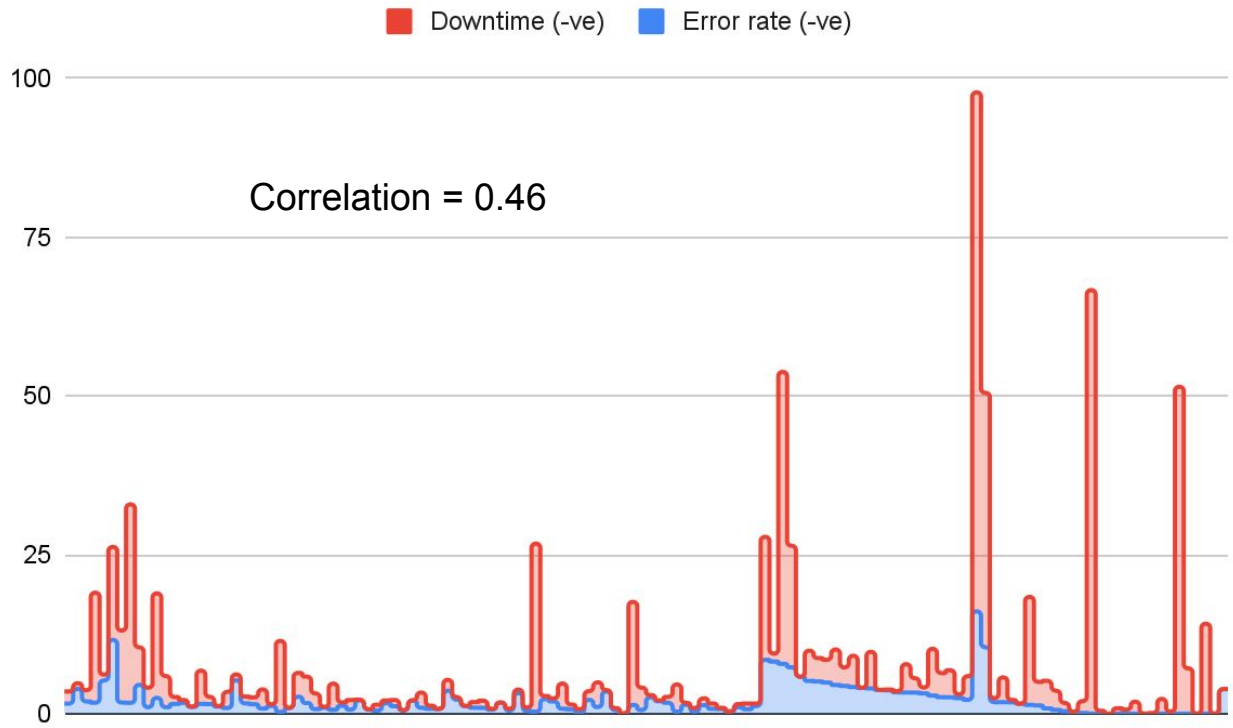
- We see that in few cases the percentage of sales reduces with increase in downtime

Rating to sales conversion



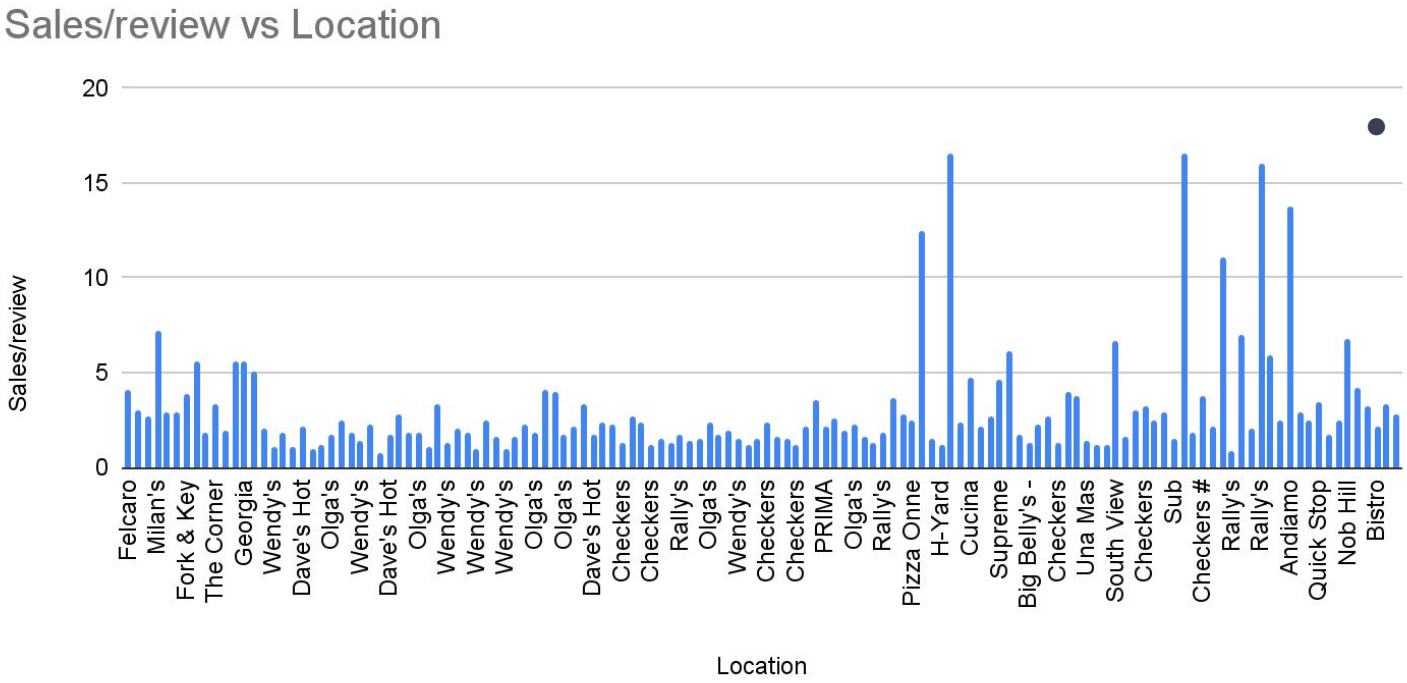
- Our analysis of restaurant data reveals that high ratings do not necessarily correlate with higher sales. In fact, moderately rated restaurants can achieve significant sales, and there are outliers where highly rated restaurants have low sales and vice versa.

Error vs. Downtime:



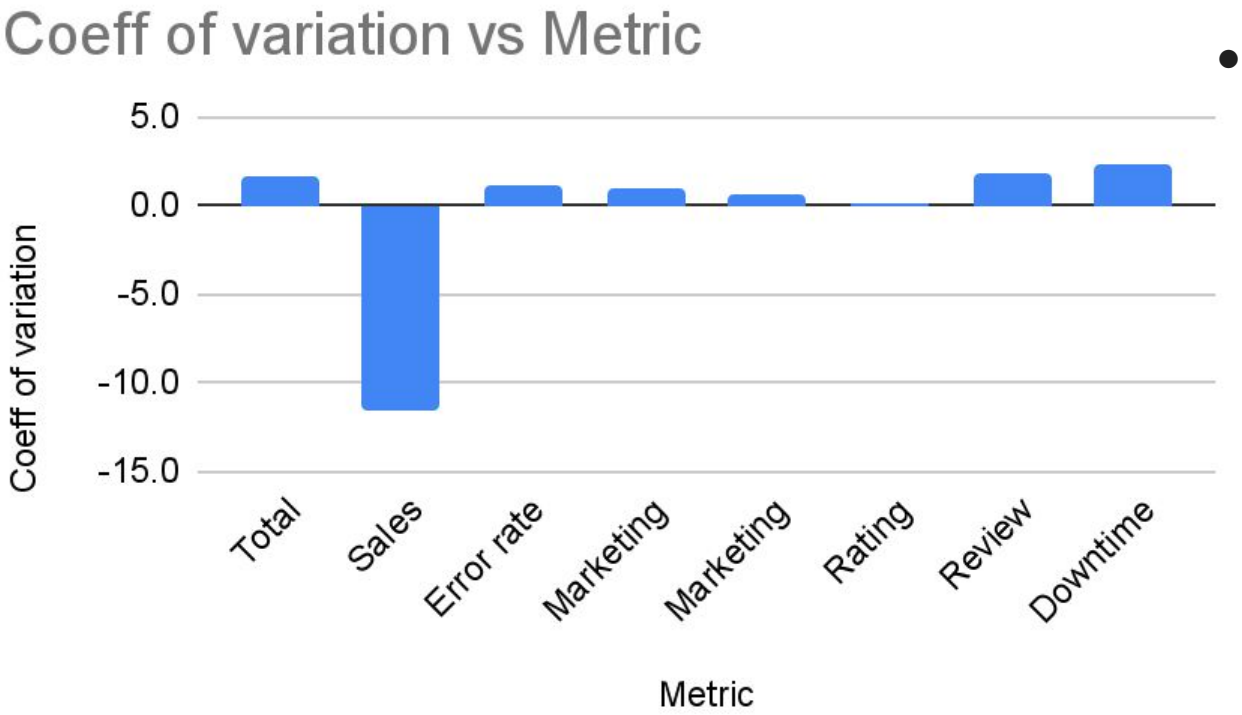
- The correlation coefficient of 0.46 indicates a positive correlation between downtime and error rate, suggesting that an increase in downtime is likely to lead to an increase in error rate.

Efficiency of Sales



- Higher sales/review ratios suggest effective conversion of positive reviews into robust sales, exemplified by H-Yard, Checkers, and Raily's.

Performance Deviation



- We observe that the percentage change in sales, downtime, and reviews exhibit significant variation, while metrics with coefficients close to zero are relatively consistent.

Regression Analysis

R-squared: 0.9436375181720356

	Variable	Coefficient
0	Sales Percentage Change	4.028751
1	Error rate (-ve)	-332.608254
2	Marketing Percentage (+ve)	-112.765067
3	Marketing ROI (+ve)	937.905192
4	Rating (+ve)	-5152.792550
5	Review Count (+ve)	232.302358
6	Downtime (-ve)	28.073971

- I have considered total sales as the dependent variable and all other metrics are independent ones
- R-squared error closer to 1 suggests that the model takes care of all the variance

Conclusion

Based on the data provided, the following factors will help restaurant owners:

- **Increase review count.** This is the strongest predictor of total sales. Restaurant owners can increase review count by encouraging customers to leave reviews after their visit, and by responding to reviews promptly and professionally.
- **Improve marketing ROI.** This is a good predictor of both total sales and sales percentage change. Restaurant owners can improve marketing ROI by tracking the results of their marketing campaigns and investing in the campaigns that are most effective.
- **Reduce error rate.** This is a good predictor of downtime. Restaurant owners can reduce error rate by training their staff properly and implementing quality control procedures.
- **Reduce downtime.** This is negatively correlated with all other metrics except error rate. Restaurant owners can reduce downtime by having a maintenance plan in place and by investing in reliable equipment.

Here are some specific actions that restaurant owners can take to improve each of the factors listed above:

- **Increase review count:**
  - Encourage customers to leave reviews by offering them a discount or other incentive.
  - Make it easy for customers to leave reviews by including a link to your review page on your website and social media pages.
  - Respond to reviews promptly and professionally, thanking customers for their feedback and addressing any concerns they may have.
- **Improve marketing ROI:**
  - Track the results of your marketing campaigns so that you can see which campaigns are most effective.
  - Invest in the marketing campaigns that are most effective and reduce your investment in the campaigns that are not as effective.
  - Test different marketing strategies and tactics to see what works best for your restaurant.
- **Reduce error rate:**
  - Train your staff properly on all aspects of the job, from preparing food to serving customers.
  - Implement quality control procedures to ensure that food is prepared and served to a high standard.
  - Monitor employee performance and provide feedback regularly.
- **Reduce downtime:**
  - Have a maintenance plan in place for all of your equipment and facilities.
  - Invest in reliable equipment that is less likely to break down.
  - Have a backup plan in place in case of unexpected downtime.

By focusing on these factors, restaurant owners can improve their business performance and achieve their financial goals.

SQL assignment

```
WITH UberEats AS (
 SELECT
   JSON_VALUE(response,
'$.data.menus."26bd579e-5664-4f0a-8465-2f5eb5fbe705".sections[0].regularHours[0].st
artTime') AS UberEats_startTime,
   JSON_VALUE(response,
'$.data.menus."26bd579e-5664-4f0a-8465-2f5eb5fbe705".sections[0].regularHours[0].en
dTime') AS UberEats_endTime,
   STRUCT(
     b_name AS b_name,
     vb_name AS vb_name
   ) AS restaurant_info
 FROM
   `arboreal-vision-339901.take_home_v2.virtual_kitchen_ubereats_hours`
),
```

```
GrubHub AS (
 SELECT
   JSON_VALUE(response, '$.today_availability_by_catalog.STANDARD_DELIVERY[0].from')
AS GrubHub_startTime,
   JSON_VALUE(response, '$.today_availability_by_catalog.STANDARD_DELIVERY[0].to') AS
GrubHub_endTime,
   STRUCT(
     b_name AS b_name,
     vb_name AS vb_name
   ) AS restaurant_info
 FROM
   `arboreal-vision-339901.take_home_v2.virtual_kitchen_grubhub_hours`
)
```

```sql
SELECT
 UberEats.UberEats_startTime,
 UberEats.UberEats_endTime,
 UberEats.restaurant_info AS UberEats_restaurant_info,
 GrubHub.GrubHub_startTime,
 GrubHub.GrubHub_endTime,
 GrubHub.restaurant_info AS GrubHub_restaurant_info,
 CASE
   WHEN GrubHub.GrubHub_startTime >= UberEats.UberEats_startTime
     AND GrubHub.GrubHub_endTime <= UberEats.UberEats_endTime THEN 'In Range'
   WHEN GrubHub.GrubHub_startTime < UberEats.UberEats_startTime
     OR GrubHub.GrubHub_endTime > UberEats.UberEats_endTime THEN 'Out of Range'
   ELSE 'Out of Range with 5 mins difference'
 END AS is_out_of_range
FROM UberEats
INNER JOIN GrubHub
ON UberEats.restaurant_info = GrubHub.restaurant_info;
```