Impact of Restaurant Ranking on Sales at Sonny's BBQ

Introduction

The data set has to do with the top 250 U.S. restaurants, with regard to their rank and sales. A positive correlation would indicate that investments to better the ranking might drive sales.

The dataset utilized comprises the top 250 restaurants in the United States, emphasizing their ranking and sales figures. A positive correlation would indicate that enhancements aimed at improving rank could potentially increase sales.

If a correlation exists, Sonny's BBQ might strategize to improve ranking by enhancing customer experience, marketing, or quality to boost sales.

Data Understanding

The analysis used a dataset with 250 entries, each representing a U.S. restaurant. Key variables are:

•Rank: Position in the top 250 restaurants.

• Sales: Sales figures for each restaurant.

• Other variables such as Restaurant, YOY_Sales (year-over-year sales growth), Units (number of units/restaurants).

Data Preparation

Loaded the data set into SAS using PROC IMPORT.

Validated dataset structure using PROC CONTENTS to view variables and types.

Reviewed summary statistics with PROC MEANS for variables like Rank and Sales to identify the data range and any anomalies.

```
PROC CONTENTS DATA=resto;

PROC MEANS DATA=resto N MEAN STD MIN MAX;

VAR  Rank Sales;
```

Modeling

Model Selection: A simple linear regression model was chosen because the aim is to explain the relationship existing between two continuous variables: rank (independent variable) and sales (dependent variable). **Implementation Steps**:

```
PROC REG DATA=WORK.RESTO;
   MODEL Sales = Rank;
   PLOT Sales*Rank / PRED;
RUN;
```

The above code uses PROC REG to perform linear regression analysis of the relationship between Sales and changes in Rank.
The PLOT statement is used to draw the regression line, showing the relationship between the two variables.

Evaluation

Results:

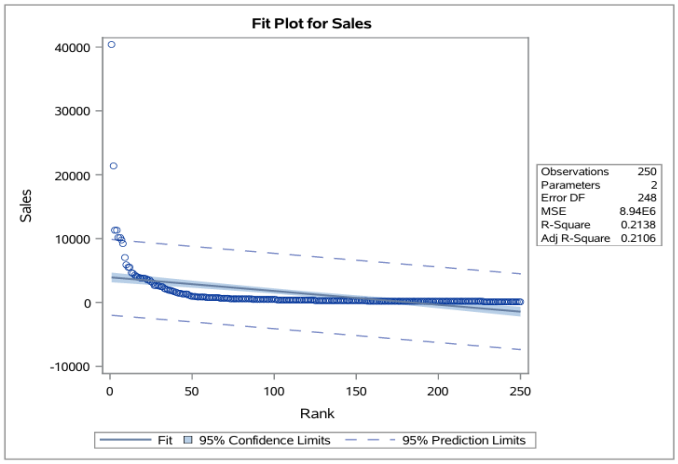
- The R-square value is approximately 0.2138, indicating that about 21.38% of the sales variation is explained by the ranking of the restaurant.
- P-value for the Rank coefficient was significant (<0.0001), which indicates a statistically significant correlation.
- The negative coefficient for Rank (-21.51634) implies that as the rank number goes down (ie, a better ranking), sales go up.

Root MSE	2989.95134	**R-Square**	0.2138
Dependent Mean	1242.74000	**Adj R-Sq**	0.2106
Coeff Var	240.59347		

Parameter Estimates

Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	3943.04125	379.33971	10.39	<.0001
Rank	Rank	1	-21.51634	2.62028	-8.21	<.0001

Interpretation: Although the relationship is significant, the relatively low R-square value indicates that other factors also affect sales.



The negative slope confirms that better ranked restaurants have higher sales.

With an R-squared this low, rank alone explains very little of the variability in sales; it is probable that other factors, such as location, marketing, or menu diversity, are at play.

The distribution of data points, especially at lower ranks, suggests that sales exhibit considerable variability among restaurants with comparable rankings, indicating a heterogeneity within the dataset that a linear model is unable to adequately represent.

Implications

Business Recommendations: A superior ranking is associated with increased sales, thereby corroborating the hypothesis. Nevertheless, the low R-square indicates that merely enhancing the rank will not ensure a significant increase in sales.
Consequently, Sonny's BBQ ought to prioritize additional elements such as marketing strategies, product quality, and customer satisfaction to effectively enhance sales performance.

In conclusion, investment can help to improve the ranking of a restaurant and might lead to better sales; however, it should be accompanied by broader efforts.