Regression and Correlation

[Enter your name here]

[Enter the name of the institution here]

All the independent variables are predicted to have a positive impact on the dependent variable, i.e. sales. It is a general perception that an increase in the product quality will result in the increase in the sales volume of the company. Similarly, the improvement in customer service will also have a positive impact on the sales volume of the company. Location refers to the number of outlets that the company has in any particular area, thus, if there are more outlets in any particular country, the sales volume of the company will increase. A poor choice of location can result in developing a negative relationship between the sales and location.

When we run the regression between sales and quality variables, the coefficient comes to 100.14 which means that a unit change in the variable named quality will bring 100.14 units change in sales for the company. The value of intercept reveals that if the quality variable is put to zero, the value of sales will be 34.88. This does not seem to be practical as there should be no sale when the quality is zero.

When the simple regression is run with the sale and customer service, the coefficient value comes out to be 23.82 which means that a unit change in the variable service quality will bring a change of 23.82 units in sales. When the variable service quality is put to zero, the value of sales comes to be 94.25. This value seems to be realistic as the company is selling some products and some quantity of products will be sold with poor service quality.

When simple regression is run with the sale and location, the coefficient value comes out to be 44.24 which means that a unit change in the variable location will bring a change of 44.24 units in the sales variable. This confirms the prediction that all the variables will have a positive relationship with sales. The value of sales will be zero when location variable is set to zero. This is shown by the value of intercept. This value seems to be true as a zero in location will mean that there are no stores selling the products.

Yes, the regression fits well with the data, this is shown by the value of r squared in the three analysis which comes out to be 0.96,0.94 and 0.98 respectively. This shows that the change in the sales is described by quality, service and location by 96%,94% and 98% respectively. The remaining differences pertains to the error terms. The r squared shows the percentage of change in the predicted variable described by the predictors (Groebner, P.W.Shannon, & Fry).

When the multiple regression is run with sales as the dependent variable and quality, service and location as the independent variables, the power of the model improves as shown by the value of R squared which comes out to be 0.99. However, the practical significance of the model will depend on the fact whether the predictors have any relationship between them (Allen).

With a 95% confidence interval, only the location variable is significant while other two variables have insignificant relationships because their P-values are greater than 0.05 (Altman, Machin, Bryant, & Gardner, 2013).

The correlation matrix shows that there is a strong relationship between the predictor variables. The coefficients of correlation are 0.95.0.96 and 0.97 which shows very strong relationships between the predictor variables. This model can be improved by adding more predictor variables (Miles & Shevlin, 2001).

The correlation coefficient shows whether any variables are related to each other. This does not show the magnitude of change in one variable as a result of change in the other variable.

# References

Allen, M. P. (n.d.). *Understanding Regression Analysis.* Washington: Plenum press.

Altman, D., Machin, D., Bryant, T., & Gardner, M. (2013). *Statistics with confidence.* Wiley.

Groebner, D., P.W.Shannon, & Fry, P. (n.d.). *Business Statistics.* Pearson.

Miles, J., & Shevlin, M. (2001). *Applying Regression and Correlation: A guide for students and researchers.* SAGE.