Mathematical solution

Student’s name

Institution

Date

**Problem 1: Sandwich sales**

**Problem**

Double Meat Place intends to launch a product in the market, but it has certain challenges, which it has to address for its sales to be successful. The main problems are the inconsistent or varieties of the sales price of the product. The prices of the product vary according to a region, and this affects the average unit sale per region. The analysis of the market text unit reveals that the average unit sales depend on the price of the Trios. The lowest sales price generates the highest average unit sales and this could and the highest sales price generates the lowest average unit sales. This could mean that the demand for the product depend on the price of the product. The fact that the averages sales depend on the price of the product is a problem because it means that the company would be able to register high sales only when the prices are low and therefore, this problem must be addressed by the marketing and sales team. Again, it is not appropriate for a company to have differences prices of the same product, this could affect the brand and image of the company in the market and therefore, it is important for the marketing and the sales department to work on the modernity to realign prices so that a company can have a common price in the market.

**Designing a solving problem**

In order to address the problem, regression formula or linear regression would be used to predict the appropriate sales price of Trios which can allow Double Meat Place to sell an average unit of 2300 per location. The regression will involve the use of graphing looking for a pattern that is applied to determine the sales unit of product for a specific region. Regression is used to establish an understanding among the variables and therefore, it will be used to determine how independent variables are related to the dependent variable in order to establish the sales price of a product per region based on the specific average unit sales. The efficient address of the problem will require the drawing of a regression curve or graph, which will provide the exact sales price per region. The data will be transfer to the excel sheet, where it will be analyzed using a data analysis tool. The coefficient of X variable and the significant F are used to draw a graph that helps in predicting the unit price of sales which will give the company an average of sale of 2300. The listed below are the sale prices and average sales per region obtained from the market test.

**Table 1: Market test Unit price**

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The regression (graphing method would be used to solve the problem identified. The graphing method is efficient and simple. Therefore, it would be able to help in obtaining the sales price faster and accurately as well compared to mathematical formula.

**Implementation of the plan**

The plan would be implemented through intensive marketing strategy focusing on building the image of the company. Image is the brand and therefore, it is important for the company to engage in different strategy to improve its brand and that will allow the company to have a common unit price in all the regions. The social media will be used to highlight the prices of Trios across the regions. The common price or unit price of the Trios based on the tabulations and as illustrated in the graph would be 2.63. Therefore, it means that the sales price of 2.63 of Trios would give Double Meat Place average sales of 2300 per region. Therefore, the marketing strategy will focus on brand building using social media, promotion and advertisement to bring customers on and also to build relationship with customers which will help the company to improve its sales in the market.

**Figure 1: Regression analysis of the data**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SUMMARY OUTPUT** |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* |  |  |  |  |  |  |  |
| Multiple R | 0.999597922 |  |  |  |  |  |  |  |
| R Square | 0.999196005 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.998928007 |  |  |  |  |  |  |  |
| Standard Error | 0.013052246 |  |  |  |  |  |  |  |
| Observations | 5 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 0.635168917 | 0.635168917 | 3728.368 | 9.67773E-06 |  |  |  |
| Residual | 3 | 0.000511083 | 0.000170361 |  |  |  |  |  |
| Total | 4 | 0.63568 |   |   |   |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 4.018475341 | 0.019818954 | 202.7592031 | 2.65E-07 | 3.955402584 | 4.0815481 | 3.955402584 | 4.081548099 |
| X Variable 1 | -0.000500292 | 8.1934E-06 | -61.06035981 | 9.68E-06 | -0.000526367 | -0.0004742 | -0.000526367 | -0.000474217 |

**Figure 2: Graph of average unit sales of Trios per region**

**Evaluation**

Based on the analysis of the process, it is evident that nothing has been miscalculated. The method used here graphing which involve the use regression techniques to establish the unit price and the general performance of the company.

**Problem 2: Drug Safety**

**Problem**

The main problem is the pain killer drug has a serious side effect. It is observed that the pain killer affects the patient’s reaction time and decision-making process. Therefore, the main problem is the side effects that are caused by the pain killer drugs being manufactured by the company. This side effect is serious because it makes it unsafe for the patient to operate heavy machinery immediately after being admitted, and therefore, the immediate solution is required.

**Solving plan**

The problem can be solved using graphing where the concept of linear regression is applied. In order to solve the problem, a suitable concentration level and hours to be taken would be determined using the regressions method. The linear graph will be drawn using two variables, independent and depended on variables. These two variables will make it easy to find the suitable time and solution level which is appropriate and cannot affect the decision-making process of any patient. The graphing method would be the best choice for this study because it provides accurate results and using will allow the team to identify the correct solution level and time with no error. Chances of making calculation errors are limited in the graphing method. Therefore, it is the best method that is used to analysis the data to complete the tabulation as well.

**Implementation**

In order to address the problem, a suitable solution level will be established using the graphing method and linear regressions. In this case, the data collected analyzed using excels worksheet, where the graph of the linear regression represented the data to obtain an appropriate point was done. Below is the illustration of how the suitable solution level was determined using coefficient and significant F, which are the values of the two variables, independent and dependent variables. The illustrated below in table 2 is the data collected from patients, which was analyzed using regression method and graphing.

**Table 2:** **Data collected from patients**

|  |  |
| --- | --- |
| **Hours after full administration** | **Concentration mcg** |
| 0 | 19.985 |
| 1 | 18.052 |
| 2 | 16.301 |
| 3 | 14.725 |
| 4 | 13.299 |
| 5 | 11.992 |
| 6 | 10.885 |
| 7 | 9.77 |
| 8 | 8.818 |
|  |  |

**Figure 3: Regression analysis of the data**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

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| --- |
| SUMMARY OUTPUT |

 |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| *Regression Statistics* |  |  |  |  |  |  |  |
| Multiple R | 0.993663263 |  |  |  |  |  |  |  |
| R Square | 0.98736668 |  |  |  |  |  |  |  |
| Adjusted R Square | 0.98556192 |  |  |  |  |  |  |  |
| Standard Error | 0.329067775 |  |  |  |  |  |  |  |
| Observations | 9 |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |  |  |
| Regression | 1 | 59.242 | 59.242 | 547.0903 | 6.63E-08 |  |  |  |
| Residual | 7 | 0.757999 | 0.108286 |  |  |  |  |  |
| Total | 8 | 60 |   |   |   |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
| Intercept | 13.81095535 | 0.433557 | 31.85502 | 7.77E-09 | 12.78576 | 14.83615 | 12.78576 | 14.83615 |
| X Variable 1 | -0.713080331 | 0.030487 | -23.39 | 6.63E-08 | -0.78517 | -0.64099 | -0.78517 | -0.64099 |

**Figure 5: Graph of concentration level**

However, the unexpected outcome was revealed. The result of the study indicates that there no appropriate time for the solution level. Though it is stated that the solution level should be 5mgc it is established that the time is not constant and therefore, the result does not provide a permanent solution to the problem being experienced by the company.

 **Evaluation**

The final result means that the solution level 5gmc does not time for the result before starting to operate a heavy machine. Therefore, time can still fluctuate, which means serious measures still needed to be taken.