Brady Buttrey

1a.

1. Months since last repair

Repair time in hours = 2.147273 + .304132 \* Months since last repair

Since the p-value for the intercept is .007517 is less than .05 we have statistically significant evidence to reject the null hypothesis that it is equal to 0. Also, Since the p value of .02 for the months is less than .05, we reject the null hypothesis that it is equal to 0. Given these, we can say it Is statistically significant at a .05 level of significance. The goodness of fit or r squared, comes out to .534177. Suggesting it explains the variability of 53% of the data which is more than half.

1. Type of repair

Repair time in hours = 3.45+.61667\* type of repair

Since the p-value of for type of repair coefficient is greater than .05, it is not statistically significant. The goodness of fit or R square, comes out to .08712. suggesting it does not explain the variability very much.

1. Repair person
   * + Repair Time in hours = 4.62 + -1.6 \* repair person
     + Because the p value for both the intercept and the repair person coefficient are less than .05 we can say this model is statistically significant
     + With an R squared value of .61, we can see that the model explains more that half of the data variability.
2. Month since last repair and type of repair
   * + Repair time in hours = .930495 (.387616 \* months since repair) + (1.262693 \* type of repair)
     + Because the p value for the intercept is greater than .05, it is not statistically significant.
     + With an R squared value of .82, it explains a significant portion of the data’s variability.

0.001048

1. Months since last repair and repair person
   * + time = 3.526329 + (-1.08354\*repair person) + (.151899 \* months since repair)
     + Because the p value for both repair person and months is above .05, this model is not statistically significant.
     + The R squared for this model is .589 or 59%, meaning that it explains a significant portion of the data’s variability.
2. Type of repair and repair person

-time = 4.25 + (.616667\*type of repair) + (-1.6\*repair person)

-Since the p value for type of repair is greater than .05, we have to say this model is not statistically significant.

-The R squared for this model is .61, which explains a decent portion of the data’s variability.

1. Months since last repair, type of repair, and repair person

-time = 1.86016 + (.291444 \* months) + (1.102406 \* type of repair) + (-0.60906 \* repair person)

-Since the repair person coefficient p value is .167 and greater than .05, we have to say this model is not statistically significant.

-The R squared for this model is .85, meaning it explains a large portion of the data variability.

1b. The best regression model to predict the estimated repair time would be the model for repair person. Of the statistically significant models, this model has the best goodness of fit which is .6 or 61%. It also has the best significance at .007 and each p-value is the lowest of the acceptable modes.

2a. The pattern shown in the line chart is that revenue starts low in Q1, then rises until Q3 where it peaks, and in Q4 it plummets. Though every year, the peak grows and the overall revenue at its peak it greater than the last.

2b. The regression model suggestions statistical significance as Significance F is .00047, though the p-values for Q1 and Q2 do not suggest significance. The goodness of fit, or adjusted R squared, comes out to .60 which means the model explains 60% of the variability within the data.

2c. The Regression model using dummy variables for each quarter is statistically significant with a significance statistic of 2.74E-10. The goodness of fit or R squared comes out to .95, which is very good because it explains almost all of the variability within the data.

2d. To forecast revenue it would be best to use the model with trend and dummy variables, this is because the model is statistically significant and the R squared explains the variability very well. This model will give the best results.

2e. Revenue = -70.1 + 45.025(Q1) + 128.35(Q2) + 256.35(Q3) + 11.675(t)

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| Year 6 Q1 | 220.1 |
| Q2 | 315.1 |
| Q3 | 454.775 |
| Q4 | 210.1 |