Inferential statistics in Decision Making:

Name:

Institution Affiliation:

Date:

1. **Does the number of inspections result in fewer faulty valves? (Run the analysis and report the results)(25 Points)**

Table 1

*Regression output*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Regression Statistics* | |  |  |  |  |  |
| Multiple R | 0.0479317 |  |  |  |  |  |
| R Square | 0.0022974 |  |  |  |  |  |
| Adjusted R Square | -0.1402314 |  |  |  |  |  |
| Standard Error | 2.972674557 |  |  |  |  |  |
| Observations | 9 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* | *Significance F* |  |
| Regression | 1 | 0.142442 | 0.1424 | 0.01611 | 0.902541 |  |
| Residual | 7 | 61.85756 | 8.83679 |  |  |  |
| Total | 8 | 62 |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
| Intercept | 5.99418604 | 2.849126 | 2.1038 | 0.0734 | -0.74293 | 12.731 |
| Inspections | 0.06104651 | 0.480828 | 0.1269 | 0.9025 | -1.07593 | 1.1980 |

Regression analysis shows a weak positive linear relationship between the number of inspections and the faulty valves (Bolshakova, 2021). The linear regression equation, number of faulty valves = 0.061 (Number of inspections) + 5.9942, shows that if the number of inspections was to increase by 100, then six additional faulty valves will be discovered. Therefore, even though the number of inspections does not significantly predict the number of faulty valves (P=0.9025), we can conclude that the higher the number of inspections, the higher the number of faulty valves.

1. **What decision should Janice make regarding the quality control inspections? (25 points)**

Based on the above results, Janice should only use quality control inspections to identify faulty valves but not reduce the number of fault valves. The results should then inform appropriate actions the company can implement to reduce the number of fault valves, such as automation of some of the production processes.