**EXECUTIVE SUMMARY**

**Problem:** Data for a random sample of profit measurements on 25 individuals. However, observation 14 has a missing entry, so we are excluding the entire observation. Input the remaining 24 observations. Our object is to characterize the dependent variable PROFIT (P) (in $100). Along with the value of Profit for 24 individuals, we have been provided with the value of two independent variables: Material A (gallons), Material B (lbs), and the days that the data was collected over 25 consecutive days and is listed in DAY. Besides characterizing the relationship between these four variables, we wish to predict PROFIT for an individual with Material A=35 gallons and Material B=95 lbs on day 26, and give a 90% confidence interval for these predictions.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Mean | Std.Dev. | Minimun | Maximum | Shape of Distribution |
| *Profit($100)* | 222.575 | 54.34437893 | 129.6 | 324.4 | unimodal |
| *DAY* | 12.95833333 | 7.515081455 | 1 | 25 | uniform |
| *A(gallons)* | 43.775 | 9.714769124 | 30.2 | 62 | unimodal, skewed to the right |
| *B(lbs)* | 71.13333333 | 2.9385987 | 66.7 | 76.5 | unimodal, skewed to the right |

Recommended Model w DAY: PROFIT= 169.39+ 4.1038\* DAY

Profit (P) in units of $100; DAY (D). SP,A=$45.75, R2= 0.32.

Using this first order model, for an individual with Material A=35 gallons and Material B=95 lbs on day 26 is 275.99 ($100) with 90% confidence interval for this prediction given by the interval (190.93,361.05)(in $100).

Recommended Model w/o DAY: PROFIT= 222.575.

Profit (P) in units of $100; SP=$ 54.26, R2= 0.047.

Using this first order model, for an individual with Material A=35 gallons and Material B=95 lbs on day 26 is 275.99 ($100) with 90% confidence interval for this prediction given by the interval (203.56,241.59)(in $100).