Problem 6.

**Weather and Tipping**

In Tech-HW-4, you did ANOVA by Excel. The three data sets and Excel output is below;



 The result of ANOVA is shown below:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| SUMMARY |  |  |  |  |  |  |
| *Groups* | *Count* | *Sum* | *Average* | *Variance* | *Standard deviation* |  |
| Good Weather | 20 | 444.4 | 22.22 | 3.837474 | 1.959 |  |
| bad Weather | 20 | 363.6 | 18.18 | 4.401684 | 2.098 |  |
| None report | 20 | 374.5 | 18.725 | 5.704079 | 2.388 |  |
|  |  |  |  | \_ |  |  |
|  |  |  |  |  |  |  |
| ANOVA |  |  |  |  |  |  |
| *Source of Variation* | *SS* | *df* | *MS* | *F* | *P-value* | *F crit* |
| Between Groups | 192.2243 | 2 | 96.11217 | 20.67931 | 1.77E-07 | 3.158843 |
| Within Groups | 264.9215 | 57 | 4.647746 |  |  |  |
|  |  |  |  |  |  |  |
| Total | 457.1458 | 59 |   |   |   |   |

1. We test if there’s differences between weather message and percent tip. State the null and alternative hypothesis
2. ANOVA requires that the standard deviation of the groups be the same. What is the rule to determine this condition? Is that rule satisfied in this case?
3. At a level of significant of α = 0.05, what is your conclusion about the test?
4. What is the pooled standard deviation?