**Problem:** Susan Sound predicts that students will learn most effectively with a constant background sound, as opposed to an unpredictable sound or no sound at all. She randomly divides twenty-four students into three groups of eight. All students study a passage of text for 30 minutes. Those in group 1 study with background sound at a constant volume in the background. Those in group 2 study with noise that changes volume periodically. Those in group 3 study with no sound at all. After studying, all students take a 10 point multiple choice test over the material. Their scores follow:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| group | test scores | | | | | | | |
| 1) constant sound | 7 | 4 | 6 | 8 | 6 | 6 | 7 | 9 |
| 2) random sound | 5 | 5 | 3 | 4 | 4 | 5 | 2 | 2 |
| 3) no sound | 2 | 4 | 2 | 1 | 2 | 1 | 5 | 5 |

1. Using the p<.05 significance level, are the test scores different depending on the sound condition? Write out the six hypothesis testing steps.
2. What is the effect size?
   1. Is that small, medium, or large?
3. Use a post hoc test with correction to determine which group had the highest test scores.

|  |  |
| --- | --- |
| Step ½ |  |
| Step 3 |  |
| Step 4 |  |
| Step 5 |  |
| Step 6 |  |
| Effect Size |  |

Tukey Post Hoc

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Group 1 | Group 2 | P-value | Comparison | Reject? |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Bonferroni Post Hoc

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Group 1 | Group 2 | P-value | Comparison | Reject? |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |