RCBD Assignment

Answer the following question using R and RMarkdown. Use the package GAD in performing your analysis. Be sure to upload both an HTML link and pdf/doc file. Note that in Latex, you may use $\alpha\_i$ to denote the factor and $\beta\_j$ to denote the block.

1. A chemist wishes to test the effect of four chemical agents on the strength of a particular type of cloth. Because there might be variability from one bolt to another, the chemist decides to use a randomized block design, with the bolts of cloth considered as blocks. She selects five bolts and applies all four chemicals in random order to each bolt. The resulting tensile strengths follow. Analyze the data from this experiment (use α=0.15) and draw appropriate conclusions. Be sure to state the linear effects model and hypotheses being tested.

|  | **Bolt** | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Chemical** | **1** | **2** | **3** | **4** | **5** |  |
| 1 | 73 | 68 | 74 | 71 | 67 |  |
| 2 | 73 | 67 | 75 | 72 | 70 |  |
| 3 | 75 | 68 | 78 | 73 | 68 |  |
| 4 | 73 | 71 | 75 | 75 | 69 |  |

1. Assume now that she didn’t block on Bolt and rather ran the experiment at a completely randomized design on random pieces of cloth, resulting in the following data. Analyze the data from this experiment (use α=0.15) and draw appropriate conclusions. Be sure to state the linear effects model and hypotheses being tested.

|  | **Replication** | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Chemical** | **1** | **2** | **3** | **4** | **5** |  |
| 1 | 73 | 68 | 74 | 71 | 67 |  |
| 2 | 73 | 67 | 75 | 72 | 70 |  |
| 3 | 75 | 68 | 78 | 73 | 68 |  |
| 4 | 73 | 71 | 75 | 75 | 69 |  |

1. Comment on any differences in the findings from questions 1 and 2. Do you believe that the Bolt of cloth represents a significant amount of nuisance variability?