

Assignment 3

Your Name

2025-06-20

About this assignment

- **Goal:** to review the concepts learned about treatment structure and design structure of split-plot experiments.
- **Due:** Friday, July 18th.

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The data in `df` below correspond to an experiment grown in 1995-1996 at the Scottish Crop Research Institute. The treatment design was a 2x70 factorial, and the design structure was a split-plot design with 4 blocks, 2 whole-plot fungicide treatments, and 70 barley varieties. The total area was 10 rows (North/South) by 56 beds (East/West).

```
library(agridat)
data("durban.splitplot")
df <- durban.splitplot
```

1.a.

Using math notation, write the statistical model to analyze that dataframe. Define all model components.

1.b.

Write an ANOVA table including source of variation and degrees of freedom. Include both the treatment and the design sources of variability.

1.c.

Fit the model in (1.a.) to the data using R software.

1.d.

Please provide the estimated treatment means for fungicide treatment “F1” and genotype “G42” and their 95% confidence intervals.

1.e.

Please provide the estimated variance components (i.e., the σ s in (1.a.).