Population Statistics
AGRON 5130

YOUR NAME HERE

Introduction

The goal of this assignment is to give you hands-on practice working with population-level summary statistics and spatial data in R, building directly on the concepts introduced in this week's videos. You will load shapefiles, explore their structure, visualize agronomic datasets, and compute basic descriptive statistics that help characterize variability across a field. Submit a knitted PDF/HTML generated from your R Markdown file to Canvas.

Loading libraries

Remember that, before we are able to use the functions within the *sf* package, we will need to load the package. Since this is the first assignment in which you will need to load an R package, I will include this chunk of code here for you. For later assignments, I will trust that you will remember this.

```
library(sf)
```

```
## Linking to GEOS 3.12.1, GDAL 3.8.4, PROJ 9.4.0; sf_use_s2() is TRUE
```

Question 1

1 point

Load the shapefile `"data/elkhart_ia_yield_map/elkhart_ia_yield_map.shp"` using `st_read()` and assign it to an object called `soybean`.

Question 2

2 point

Inspect the structure of the `soybean` data frame using `head()` and `summary()`.

Question 3

2 points Plot the yield map and create a histogram of the yield values.

Question 4

2 points

Calculate the **mean**, **median**, and **standard deviation** of the soybean yield.

Question 5

1 point

Load the planting map `"data/moline_il_planting_map/moline_il_planting_map.shp"` and assign it to an object called moline.

Question 6

1 point

Inspect the `moline` data using `head()`.

Question 7

2 points

Plot the `"AppldRt"` (actual planting rate) column and produce a histogram of the planting rate.

Question 8

1 point

Calculate the mean actual planting rate.

Question 9

1 point

Calculate the minimum actual planting rate.

Question 10

2 points

Calculate the standard deviation of the actual planting rate and write 1–2 sentences about what this indicates for variability in planting rate.

Write your brief interpretation here:

`(Your answer)`