

# DailyCheck#10

2025-04-30

## R Markdown

### Question

- 1) Explain the relevance of the Sum of Squares values displayed on Slide 10 as discussed in class (Slide 12 may also be helpful in your understanding of it).

$SSE = SSB + SSE(B)$   $5.09375 = 2.015625 + 3.078125$  On Slide 10, we know how the total variation in our experiment is split up when we use a Randomized Complete Block Design. Without any blocking, the total leftover variation is 5.094. We are split that variation into two parts.  $SSB(\text{Sum of Squares for Blocks}) = 2.016$   $SSE(B) (\text{Residual Error after Blocking}) = 3.078$

the block is useful because it helps us remove extra variation that comes from differences between blocks. The leftover error becomes smaller, which improves the accuracy of our F-test. A smaller error makes it easier to spot real differences between treatments.

```
library(readxl)
vasc <- read_excel("VascGraft.xlsx")
```

```
library(dplyr)
```

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##   filter, lag

## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union
```

```
sum_stats <- vasc %>%
  group_by(PSI) %>%
  summarize(mean=mean(yield), var=var(yield))
knitr::kable(sum_stats)
```

	PSI	mean	var
	8500	92.81667	20.949667
	8700	91.68333	10.917667

	PSI	mean	var
	8900	88.91667	8.801667
	9100	85.76667	19.758667

Base case:

```
groupmeans <- sum_stats$mean
power.anova.test(groups = length(groupmeans), between.var = var(groupmeans), within.var = 8,
                  power = 0.8, sig.level = 0.05, n = NULL)
```

```
##
##      Balanced one-way analysis of variance power calculation
##
##      groups = 4
##      n = 4.059657
##      between.var = 9.898403
##      within.var = 8
##      sig.level = 0.05
##      power = 0.8
##
## NOTE: n is number in each group
```

## Including Plots

You can also embed plots, for example:



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.