STA 602 Lab 9

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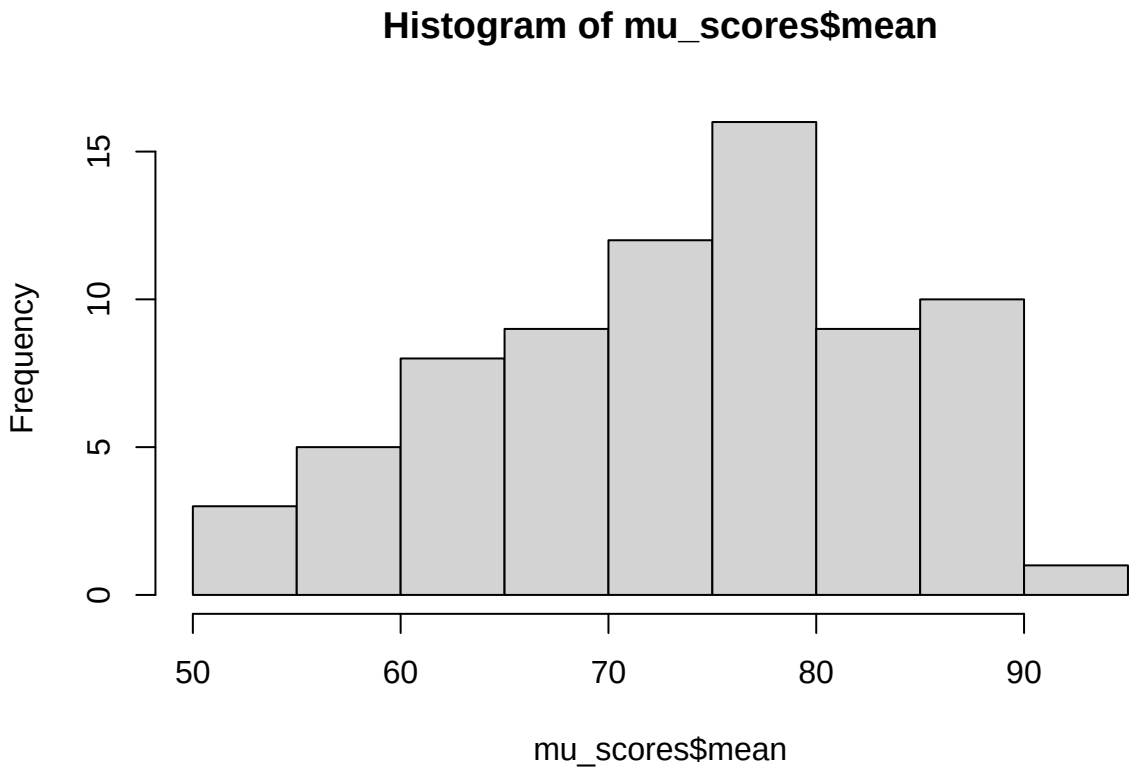
```
data(Gcsemv, package = "mlmRev")

# Make Male the reference category and rename variable
Gcsemv$female <- relevel(Gcsemv$gender, "M")

# Use only total score on coursework paper
GCSE <- subset(x = Gcsemv,
               select = c(school, student, female, course))

# Count unique schools and students
m <- length(unique(GCSE$school))
N <- nrow(GCSE)
```

Ex 1

Here we plot the histogram of the sample mean of course scores for each school. The distribution is left skewed with a mean around 77.

```
mu_scores = Gcsemv %>%
    group_by(school) %>%
    summarize(mean = mean(course, na.rm=TRUE))

hist(mu_scores$mean)
```



Ex 2

```
pooled <- stan_glm(course ~ 1 + female, data = GCSE, refresh = 0)
unpooled <- stan_glm(course ~ -1 + school + female,data=GCSE, refresh = 0)
mod1 <- stan_lmer(formula = course ~ 1 + (1 | school),
                  data = GCSE,
                  seed = 349,
                  refresh = 0)
```