# Group Work 02

```
library(bayesrules) # R package for our textbook
library(tidyverse) # Collection of packages for tidying and plotting data
library(janitor) # Helper functions like tidy and tabyl
```

## 1 BR Exercise 2.13

## 2 BR Exercise 2.18

## 3 BR Exercise 2.17

## 4 MLE

If $Y \sim \text{Binom}(n, \pi)$, show that $\hat{\pi}_{MLE} = \frac{Y}{n}$

## 5 BR Exercise 3.1

For each part, use `plot_beta` and/or `summarize_beta` to justify your answer

## 6 BR Exercise 3.12

## 7 Choice of prior

I am interviewing Carleton students about whether or not they have used (knowingly) used ChatGPT on coursework in a non-approved way. I think the proportion has a 90% chance of being less than .25.

(a) Choose an informative prior that you think is reasonable for this belief

I then ask 20 students this question and 15 respond "yes". Find the posterior using the prior from above, then using the 3 non/weakly informative priors below:

(a) Unif(0,1) prior
(b) Beta(2,2) prior
(c) "Reference" prior Beta(.5, .5)

Compare the posteriors for each of the priors above. Do results change if we instead observe 150/200 students responding "yes"?

# 8 BR 4.13

> **Note**
>
> For part (a), you do not need to include your sketch in your submission!