# Assignment 2 - Bayesian data analysis

anonymous

# 1 General information

# 2 Inference for binomial proportion

**Loading the library and the data.**

```r
library(aaltobda)
data("algae")
# The data are now stored in the variable `algae`.
```

The below data is **only for the tests**, you need to change to the full data `algae` when reporting your results.

```r
algae_test <- c(0, 1, 1, 0, 0, 0)
```

## 2.1 (a)

**Write the likelihood, the prior and the posterior here!**

```r
# Not the actual values below,
# you will have to compute those from the data!
alpha = 10
beta = 20
```

You can do string interpolation using R inline code execution in quarto as such:

$\alpha$ is **10** and $\beta$ is **20**.

This template defines a `\BetaDist` TeX command which renders `\BetaDist(1,2)` as $\text{Beta}(1, 2)$.

## 2.2 (b)

Keep the below name and format for the functions to work with `markmyassignment`:

```r
# Useful R function: qbeta()

beta_point_est <- function(prior_alpha, prior_beta, data) {
    # Do computation here, and return as below.
    # This is the correct return value for the test data provided above.
    0.2222222
}
beta_interval <- function(prior_alpha, prior_beta, data, prob = 0.95) {
    # Do computation here, and return as below.
    # This is the correct return value for the test data provided above.
    c(0.0846451, 0.3956414)
}
```

## 2.3 (c)

Keep the below name and format for the function to work with `markmyassignment`:

```r
# Useful function: pbeta()

beta_low <- function(prior_alpha, prior_beta, data, pi_0) {
    # Do computation here, and return as below.
    # This is the correct return value for the test data provided above.
    0.4511238
}
```

## 2.4 (d)

Write your answer here!

## 2.5 (e)

Plot the PDFs here. Explain shortly what you do.

```r
# Useful function: dbeta()
```