

# Assignment 2

anonymous

## 1 General information

## 2 Inference for binomial proportion

Loading the library and the data.

```
library(aaltobda)
data("algae")
# The data are now stored in the variable `algae`.
# These are the values for the prior required in the assignment
prior_alpha = 2
prior_beta = 10
```

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

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

### 2.1 (a)

Write the likelihood, the prior and the posterior here!

```
# These are not the actual values for the posterior!
# You will have to compute those from the data!
posterior_alpha = 2
posterior_beta = 10
```

You can do [string interpolation](#) using [R inline code execution in quarto](#) as such:

$\alpha_{\text{prior}}$  is **2** and  $\beta_{\text{prior}}$  is **10**. Or string interpolation within math:  $\text{Beta}(2, 10)$

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

## 2.2 (b)

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

```
# Useful 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,
  # combined with the prior provided above.
  0.2222222
}

beta_interval <- function(prior_alpha, prior_beta, data, prob=0.9) {
  # Do computation here, and return as below.
  # This is the correct return value for the test data provided above,
  # combined with the prior provided above.
  c(0.0846451, 0.3956414)
}
```

## 2.3 (c)

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

```
# Useful function: pbeta()

beta_low <- function(prior_alpha, prior_beta, data, pi_0=0.2) {
  # Do computation here, and return as below.
  # This is the correct return value for the test data provided above,
  # combined with the correct prior.
  0.4511238
}
```

## 2.4 (d)

Write your answer here!

## 2.5 (e)

Plot the PDFs here. Explain shortly what you do.

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