Assignment 1

anonymous

1 General information

2 Basic probability theory notation and terms

Write your answers here!

3 Basic computer skills

Do some setup here. Explain in text what you do.

```
# Do some setup:
distribution_mean = .2
distribution_variance = .01

# You have to compute the parameters below from the given mean and variance
# distribution_alpha = ...
# distribution_beta = ...
```

3.1 (a)

Plot the PDF here. Explain in text what you do.

```
# Useful functions: seq(), plot() and dbeta()
```

3.2 (b)

Sample and plot the histogram here. Explain in text what you do.

```
# Useful functions: rbeta() and hist()
```

3.3 (c)

Compute the sample mean and variance here. Explain in text what you do.

```
# Useful functions: mean() and var()
```

3.4 (d)

Compute the central interval here. Explain in text what you do.

```
# Useful functions: quantile()
```

4 Bayes' theorem 1

4.1 (a)

Compute the quantities needed to justify your recommendation here. Explain in text what you do. You can do the computation with pen and paper or in R. Either way, you have to explain why you compute what you compute.

5 Bayes' theorem 2

You will need to change the numbers to the numbers in the exercise.

```
boxes_test <- matrix(c(2,2,1,5,5,1), ncol = 2,
    dimnames = list(c("A", "B", "C"), c("red", "white")))
```

5.1 (a)

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

```
p_red <- function(boxes) {
    # Do computation here, and return as below.
    # This is the correct return value for the test data provided above.
    0.3928571
}
```

5.2 (b)

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

```
p_box <- function(boxes) {
    # Do computation here, and return as below.
    # This is the correct return value for the test data provided above.
    c(0.29090909,0.07272727,0.63636364)
}
```

6 Bayes' theorem 3

6.1 (a)

You will need to change the numbers to the numbers in the exercise.

```
fraternal_prob = 1/125
identical_prob = 1/300
```

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

```
p_identical_twin <- function(fraternal_prob, identical_prob) {
    # Do computation here, and return as below.
    # This is the correct return value for the test data provided above.
    0.4545455
}
```

7 The three steps of Bayesian data analysis

7.1 (a)