Notes: MS 204 Chapter 2

Overview

- Hypothesis testing framework
- Simulating an experiment

An example

```
library(tidyverse)
library(mosaic)
seeded <- c(rep(0, 12), rep(1, 24), rep(0, 4), rep(1, 10))
yawned <- c(rep(0, 36), rep(1, 14))
Yawners <- data.frame(seeded, yawned)
tally(yawned ~ seeded, Yawners)
```

```
##       seeded
## yawned  0  1
##      0 12 24
##      1  4 10
```

Chapter 1 review:

- Study type, variable types, sample/population

Possible claims

Hypothesis testing framework

Overview

Details

Simulation

Code

```
set.seed(10)
seeded <- c(rep(0, 12), rep(1, 24), rep(0, 4), rep(1, 10))
yawned <- c(rep(0, 36), rep(1, 14))

Yawners <- data.frame(seeded, yawned)
mean(yawned ~ seeded, data = Yawners)
```

```
##         0         1
## 0.2500000 0.2941176
```

```
obs <- diff(mean(yawned ~ seeded, data = Yawners))
obs
```

```
##          1
## 0.04411765
```

```
diff(mean(yawned ~ shuffle(seeded), data = Yawners))
```

```
##           1
## -0.04779412
```

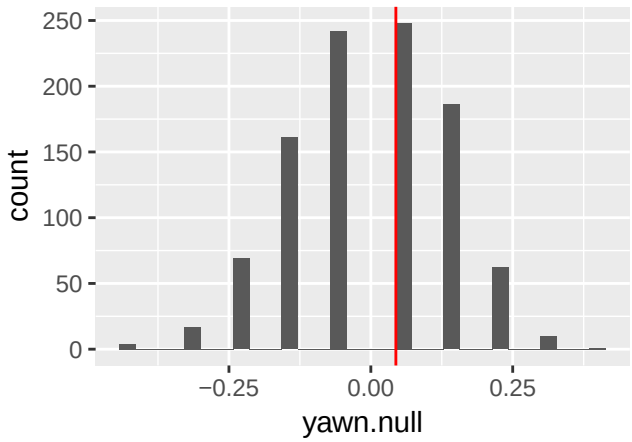
```
diff(mean(yawned ~ shuffle(seeded), data = Yawners))
```

```
##         1
## 0.2279412
```

```
yawn.null <- do(1000) * diff(mean(yawned ~ shuffle(seeded), data=Yawners))
yawn.null %>% head()
```

```
##            X1
## 1  0.13602941
## 2  0.13602941
## 3 -0.04779412
## 4  0.04411765
## 5 -0.13970588
## 6 -0.32352941
```

```
qplot(yawn.null) + geom_vline(aes(xintercept = obs), colour = "red")
```




```
yawn.null %>% summarise(p.value = mean(X1 >= obs))
```

```
##   p.value
## 1   0.507
```

Summary

A note on coding

```
set.seed(0)
seeded <- c(rep(0, 12), rep(1, 24), rep(0, 4), rep(1, 10))
yawned <- c(rep(0, 36), rep(1, 14))
Yawners <- data.frame(seeded, yawned)
tally(yawned ~ seeded, Yawners)
```

```
##        seeded
## yawned  0  1
##      0 12 24
##      1  4 10
```