

# Untitled

2024-11-25

```
#setwd("C:/Users/jake pc/Desktop/Personal_save/Stat_405_Module_14")
setwd("/Users/jacobrichards/Desktop/Personal_save/Stat_405_Module_14/Lab_14.1")
test <- read.csv(file="hypothesis.csv",header=TRUE)
test
```

```
##   Aspirin Tylenol
## 1      40      35
## 2      42      37
## 3      48      42
## 4      35      22
## 5      62      38
## 6      35      29
```

The following table shows the time for subjects to feel relief from headache pain:

a.) Perform a t-test. Is either product significantly faster than the other at the 0.05 level?

The data is the same as Lab 6.1 question 1 where the samples were independent so the following independent 2 sample t-test is performed.

Two sample, two tailed, independent t-test.

```
test$id <- seq(1:nrow(test))
test
```

```
##   Aspirin Tylenol id
## 1      40      35  1
## 2      42      37  2
## 3      48      42  3
## 4      35      22  4
## 5      62      38  5
## 6      35      29  6
```

```
library(reshape2)
long_data <- melt(data = test, id.vars = c("id"),
                  measured.vars = c("Aspirin", "Tylenol"),
                  variable.name = "Brand", value.name = "Time")
long_data
```

```
##   id  Brand Time
## 1  1 Aspirin  40
## 2  2 Aspirin  42
## 3  3 Aspirin  48
## 4  4 Aspirin  35
## 5  5 Aspirin  62
## 6  6 Aspirin  35
## 7  1 Tylenol  35
## 8  2 Tylenol  37
## 9  3 Tylenol  42
```

```
## 10 4 Tylenol 22
## 11 5 Tylenol 38
## 12 6 Tylenol 29
```

```
t.test(long_data$Time ~ long_data$Brand)
```

```
##
## Welch Two Sample t-test
##
## data: long_data$Time by long_data$Brand
## t = 1.9283, df = 8.983, p-value = 0.08597
## alternative hypothesis: true difference in means between group Aspirin and group Tylenol is not equal to 0
## 95 percent confidence interval:
## -1.706005 21.372671
## sample estimates:
## mean in group Aspirin mean in group Tylenol
## 43.66667 33.83333
```

The p-value resulting from the test is greater than 0.05, fail to reject the null hypothesis that the true difference in means between the groups is zero.

b.) Perform a Wilcoxon rank-sum test.

```
library(coin)
```

```
## Loading required package: survival
```

```
wilcox_test(Time ~ Brand, data = long_data, distribution = "exact")
```

```
##
## Exact Wilcoxon-Mann-Whitney Test
##
## data: Time by Brand (Aspirin, Tylenol)
## Z = 1.5347, p-value = 0.1385
## alternative hypothesis: true mu is not equal to 0
```

The p-value resulting from the test is greater than 0.05, fail to reject the null hypothesis that the true location shift is equal to zero.