Untitled

2024-11-25

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

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
## 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.

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

```
## Warning in wilcox.test.default(x = DATA[[1L]], y = DATA[[2L]], ...): cannot
## compute exact p-value with ties
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  long_data$Time by long_data$Brand
## W = 27.5, p-value = 0.146
## alternative hypothesis: true location shift 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.