

Paul Kogan-HW3

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[illegible]

1

```
stock <- read.table("d_logret_6stocks.txt", T)
intel <- stock$Intel
pfizer <- stock$Pfizer
ip_var <- var.test(intel, pfizer)
t_i <- t.test(intel)
w_i <- wilcox.test(intel, pfizer, conf.int = T)
t_ip <- t.test(intel, pfizer, var.equal = ip_var$p.value > 0.05)
w_ip <- wilcox.test(intel, pfizer, conf.int = T)

cat("a:\n")
t_i
cat("conclusion: p-value =", t_i$p.value, conc(t_i),
    "mean of intel return is zero\n\n")

cat("b:\n")
w_i
cat("conclusion: p-value = ", w_i$p.value, conc(w_i),
    "mean of intel return is zero\n\n")

cat("c:\n")
t_ip
cat("conclusion: p-value =", t_ip$p.value, conc(t_ip),
    "mean returns of pfizer and intel are the same\n\n")

cat("d:\n")
w_ip
cat("conclusion: p-value =", w_ip$p.value, conc(w_ip),
    "mean returns of pfizer and intel are the same\n\n")

cat("e:\n")
ip_var
```

```
cat("conclusion: p-value =", ip_var$p.value, conc(ip_var),
    "variances of returns of pfizer and intel are the same\n\n")
```

```
## a:
##
## One Sample t-test
##
## data: intel
## t = -0.70588, df = 63, p-value = 0.4829
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
## -0.02293067 0.01095951
## sample estimates:
## mean of x
## -0.005985579
##
## conclusion: p-value = 0.482864 > alpha = 0.05 so fail to reject the null hypothesis
## that the mean of intel return is zero
##
## b:
##
## Wilcoxon rank sum test with continuity correction
##
## data: intel and pfizer
## W = 2077, p-value = 0.892
## alternative hypothesis: true location shift is not equal to 0
## 95 percent confidence interval:
## -0.01347123 0.01871938
## sample estimates:
## difference in location
## 0.001019999
##
## conclusion: p-value = 0.8919643 > alpha = 0.05 so fail to reject the null hypothesis
## that the mean of intel return is zero
##
## c:
##
## Welch Two Sample t-test
##
## data: intel and pfizer
## t = -0.21707, df = 77.394, p-value = 0.8287
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
## -0.01977844 0.01588991
## sample estimates:
## mean of x mean of y
## -0.005985579 -0.004041315
##
## conclusion: p-value = 0.8287273 > alpha = 0.05 so fail to reject the null hypothesis
## that the mean returns of pfizer and intel are the same
##
## d:
##
```

```

## Wilcoxon rank sum test with continuity correction
##
## data: intel and pfizer
## W = 2077, p-value = 0.892
## alternative hypothesis: true location shift is not equal to 0
## 95 percent confidence interval:
## -0.01347123 0.01871938
## sample estimates:
## difference in location
## 0.001019999
##
## conclusion: p-value = 0.8919643 > alpha = 0.05 so fail to reject the null hypothesis
## that the mean returns of pfizer and intel are the same
##
## e:
##
## F test to compare two variances
##
## data: intel and pfizer
## F = 8.6379, num df = 63, denom df = 63, p-value = 3.553e-15
## alternative hypothesis: true ratio of variances is not equal to 1
## 95 percent confidence interval:
## 5.247738 14.218152
## sample estimates:
## ratio of variances
## 8.63789
##
## conclusion: p-value = 3.552714e-15 < alpha = 0.05 so reject the null hypothesis
## that the variances of returns of pfizer and intel are the same

```

2

```

bp26 <- c(152, 157, 179, 185, 178, 149)
bp5 <- c(384, 369, 354, 367, 375, 423)
t_bp <- t.test(bp26, bp5, "greater",
               var.equal = var.test(bp26, bp5)$p.value > 0.05)
t_bp
cat("conclusion: p-value =", t_bp$p.value, conc(t_bp),
    "mean blood pressures are the same\n\n")

```

```

##
## Two Sample t-test
##
## data: bp26 and bp5
## t = -18.173, df = 10, p-value = 1
## alternative hypothesis: true difference in means is greater than 0
## 95 percent confidence interval:
## -233.1437 Inf
## sample estimates:
## mean of x mean of y
## 166.6667 378.6667
##
## conclusion: p-value = 1 > alpha = 0.05 so fail to reject the null hypothesis
## that the mean blood pressures are the same

```

```

lvl <- .1
affected <- c(488, 478, 480, 426, 440, 410, 458, 460)
not_a <- c(484, 478, 492, 444, 436, 398, 464, 476)
s_aff <- shapiro.test(affected)
s_not <- shapiro.test(not_a)
s_affc <- conc(s_aff, lvl)
s_notc <- conc(s_not, lvl)
v_a <- var.test(affected, not_a)
t_aff <- t.test(affected, not_a, conf.level = 1 - lvl,
               var.equal = v_a$p.value > lvl)
assumptions <- c(paste("data in each group are ", sep = "",
                        ifelse(grepl("<", s_affc, F, F, T) ||
                              grepl("<", s_notc, F, F, T), "not ", ""), "normal"),
                 paste("variances of the groups are ",
                        ifelse(!v_a$p.value > lvl, "not ", ""), "equal", sep = ""))

cat("a:\n\tAffected")
s_aff
cat("conclusion: p-value =", s_aff$p.value, s_affc,
    "data are normal\n\n\tNot Affected")
s_not
cat("conclusion: p-value =", s_not$p.value, s_notc,
    "data are normal\n")
v_a
cat("conclusion: p-value =", s_not$p.value, s_notc,
    "variances are equal\n\nassumptions checked:\t")
for (assumption in assumptions) cat(assumption, "\n\t\t\t\t\t\t\t")
t_aff
cat("conclusion: p-value =", t_aff$p.value, conc(t_aff),
    "corneal thickness is equal for affected versus unaffected eyes\n\n")
cat("b:\t", t_aff$conf.int[1:2], "\n\n")

## a:
## Affected
## Shapiro-Wilk normality test
##
## data: affected
## W = 0.9402, p-value = 0.6131
##
## conclusion: p-value = 0.6130593 > alpha = 0.1 so fail to reject the null hypothesis
## that the data are normal
##
## Not Affected
## Shapiro-Wilk normality test
##
## data: not_a
## W = 0.90211, p-value = 0.3018
##
## conclusion: p-value = 0.301824 > alpha = 0.1 so fail to reject the null hypothesis
## that the data are normal
##
## F test to compare two variances

```

```
##
## data:  affected and not_a
## F = 0.78205, num df = 7, denom df = 7, p-value = 0.7539
## alternative hypothesis: true ratio of variances is not equal to 1
## 95 percent confidence interval:
##  0.1565697 3.9062752
## sample estimates:
## ratio of variances
##      0.7820513
##
## conclusion: p-value = 0.301824 > alpha = 0.1 so fail to reject the null hypothesis
##           that the variances are equal
##
## assumptions checked: data in each group are normal
##                   variances of the groups are equal
##
## Two Sample t-test
##
## data:  affected and not_a
## t = -0.27065, df = 14, p-value = 0.7906
## alternative hypothesis: true difference in means is not equal to 0
## 90 percent confidence interval:
## -30.03098 22.03098
## sample estimates:
## mean of x mean of y
##      455      459
##
## conclusion: p-value = 0.7906108 > alpha = 0.1 so fail to reject the null hypothesis
##           that the corneal thickness is equal for affected versus unaffected eyes
##
## b:      -30.03098 22.03098
```

4

```
mean <- 25
time <- c(28, 25, 27, 31, 10, 26, 30, 15, 55, 12, 24, 32, 28, 42, 38)
s_time <- shapiro.test(time)
t_time <- t.test(time, alternative = "greater", mu = mean, conf.level = .95)

cat("a:\n")
s_time
cat("conclusion: p-value =", s_time$p.value, conc(s_time),
    "data are normal\n\n")

cat("b:\n")
t_time
cat("conclusion: p-value =", t_time$p.value, conc(t_time),
    "mean time for a warehouse to fill a buyers order is", mean, "minutes\n\n")
```

```
## a:
##
## Shapiro-Wilk normality test
##
```

```

## data:  time
## W = 0.94167, p-value = 0.4038
##
## conclusion: p-value = 0.4037724 > alpha = 0.05 so fail to reject the null hypothesis
##             that the data are normal
##
## b:
##
## One Sample t-test
##
## data:  time
## t = 1.0833, df = 14, p-value = 0.1485
## alternative hypothesis: true mean is greater than 25
## 95 percent confidence interval:
##  22.99721      Inf
## sample estimates:
## mean of x
##      28.2
##
## conclusion: p-value = 0.1484898 > alpha = 0.05 so fail to reject the null hypothesis
##             that the mean time for a warehouse to fill a buyers order is 25 minutes

```