Chapter 11: Comparisons of Means and Proportions

Example 1

```
qt(0.025, 59, lower.tail = FALSE)
```

Example 2

```
qt(0.025, 59, lower.tail = FALSE)
```

Example 3

```
pt(2.17, 59, lower.tail = FALSE) + pt(-2.17, 59)
```

Example 4

```
head(holidays, 3)

t.test(holidays$algarve, holidays$cascais, conf.level = 0.95)

t.test(holidays$algarve, holidays$cascais, conf.level = 0.95,
       var.equal = TRUE)
```

Example 5

```
qt(0.025, 19)

qt(0.025, 19, lower.tail = FALSE)
```

Example 6

```
pt(4.814, 19, lower.tail = FALSE) + pt(-4.814, 19)
```

Example 7

```
head(cad, 3)


t.test(cad$old, cad$new, conf.level = 0.95, paired = TRUE)

t.test(cad$old, cad$new, conf.level = 0.95)
```

Example 8

```
options(scipen = 999)

head(londontimes, 3)

t.test(londontimes$Women, londontimes$Men, paired = TRUE,
       conf.level = 0.99)
```

Example 9

```
qnorm(0.025, lower.tail = FALSE)
```

Example 10

```
qnorm(0.025, lower.tail = FALSE)
```

Example 11

```
pnorm(5.0753, lower.tail = FALSE) + pnorm(-5.0753)
```

Example 12

```
options(scipen = 999)

obama <- c(749, 558)

total <- c(1337, 1214)

prop.test(obama, total, conf.level = 0.95, correct = FALSE)
```

End-of-Chapter11 Exercises

Exercise 1

```
ex1 <- c(79, 92, 81, 80, 79, 80, 78, 88, 86, 88, 77, 93)

ex2 <- c(80, 75, 67, 82, 76, 71, 78, 78, 80, 77, 78, 75)

scores <- data.frame(Exam1 = ex1, Exam2 = ex2)

mean(scores$Exam1)
mean(scores$Exam2)

mean(scores$Exam1) - mean(scores$Exam2)
```

```
t.test(scores$Exam1, scores$Exam2, conf.level = 0.95, paired =
    TRUE)
```

Exercise 2

```
qt(0.025, 79, lower.tail = FALSE)
```

Exercise 3

```
t.test(temps$Daytemp, temps$Nighttemp, conf.level = 0.90,
    paired = TRUE)

t.test(temps$Daytemp, temps$Nighttemp, conf.level = 0.99,
    paired = TRUE)
```

Exercise 4

```
bad <- c(82, 28)

total <- c(900, 800)

prop.test(bad, total, conf.level = 0.95, correct = FALSE)
```

Exercise 5

```
pnorm(2.1553, lower.tail = FALSE) + pnorm(-2.1553)

illiquid <- c(54, 36)

total <- c(200, 200)

prop.test(illiquid, total, conf.level = 0.95, correct = FALSE)
```

R Functions

. t.test(name1, name2, conf.level=0.95) Welch Two-Sample t-test performs a two-tail hypothesis test on the difference between the means of 2 independent populations when the population variances are not necessarily equal. Also provides a 95% confidence interval estimate of the difference, although any level of confidence can be specified by adjusting the conf.level= argument.

. t.test(name1, name2, conf.level = 0.95, var.equal = TRUE) Two-Sample t-test performs a two-tail hypothesis test on the difference between the means of 2 independent populations when the population variances are assumed to be equal. Also provides a 95% confidence interval estimate of the difference, although any level of confidence can be specified by adjusting the conf.level= argument.

. t.test(name1, name2, conf.level = 0.95, paired = TRUE)

.

. Paired t-testperforms a two-tail hypothesis test on the difference between the means of 2 paired popula- tions. Also provides a 95% confidence interval estimate of the difference, although any level of confidence can be specified by adjusting the conf.level= argument.

. prop.test(counts1, totals2, conf.level = 0.95, correct = FALSE)
Known as the 2-sample test for equality of proportions without continuity correct, this function performs a two-tail hypothesis test on the difference between the proportions of 2 independent populations. Also provides a 95% confidence interval estimate of the difference, although any level of confidence can be specified by adjusting the conf.level= argument.