**Ejercicio 1 – Hoja 3**

**a)**

> Regular <- c(2.5, 1.5, 7, 4, 8.2, 6.8, 9.5, 8)

> Ocasional <- c(0.75, 1.5, 3, 1, 4, 4.5, 6.5, 5)

> t.test(Regular, Ocasional, alternative = "two.sided")

 **Welch Two Sample t-test**

data: Regular and Ocasional

t = 2.1026, df = 12.665, p-value = 0.0561

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

 -0.08040178 5.39290178

sample estimates:

mean of x mean of y

 5.93750 3.28125

**b)**

> t.test(Regular, Ocasional, alternative = "greater")

 **Welch Two Sample t-test**

data: Regular and Ocasional

t = 2.1026, df = 12.665, p-value = 0.02805

alternative hypothesis: true difference in means is greater than 0

95 percent confidence interval:

 0.4144129 Inf

sample estimates:

mean of x mean of y

 5.93750 3.28125

**Ejercicio 2 – Hoja 3**

> AE <- c(169.7, 168.5, 165.9, 177.8, 179.6, 168.9, 169.2, 167.9, 181.8, 163.3)

> D2 <- c(168.2, 165.5, 164.4, 175.7, 176.6, 166.1, 167.1, 166.3, 179.7, 161.5)

> t.test(AE, D2, alternative = "two.sided", paired = TRUE)

 **Paired t-test**

data: AE and D2

t = 11.5014, df = 9, p-value = 1.104e-06

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

 1.727125 2.572875

sample estimates:

mean of the differences

 2.15

**Ejercicio 3 – Hoja 3**

> Ciudad1 <- c(5.9, 6.1, 6.3, 6.1, 6, 6.2, 5.7, 6.3, 6.6)

> Ciudad2 <- c(6.4, 6.3, 6.5, 6.1, 5, 5.5, 4.7, 5.1, 2.8, 1.8, 1.5)

> t.test(Ciudad1, Ciudad2, alternative = "two.sided")

 **Welch Two Sample t-test**

data: Ciudad1 and Ciudad2

t = 2.5548, df = 10.486, p-value = 0.02768

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

 0.1910587 2.6756080

sample estimates:

mean of x mean of y

 6.133333 4.700000

**Ejercicio 4 – Hoja 3**

> x <- runif(114)

> y <- runif(123)

> X <- 2.71 + (x - mean(x))\*0.64/sd(x)

> Y <- 2.79 + (y - mean(y))\*0.56/sd(y)

> t.test(X, Y, alternative = "two.sided")

 **Welch Two Sample t-test**

data: X and Y

t = -1.0207, df = 225.227, p-value = 0.3085

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

 -0.23444125 0.07444125

sample estimates:

mean of x mean of y

 2.71 2.79

**No asumimos normalidad de las notas**

> 2\*(1-pnorm(abs(-1.0207)))

[1] 0.3073966

**Ejercicio 5 – Hoja 3**

> Departamento1 <- c(0.6, 1.2, 0.9, 1.9, 2.0, 0.6, 0.9, 2.0, 0.8, 1.0)

> Departamento2 <- c(0.4, 1.3, 1.1, 2.1, 1.9, 0.5, 1.1, 1.7, 0.8, 1.1)

> t.test(Departamento1, Departamento2, alternative = "two.sided", paired = TRUE)

 **Paired t-test**

data: Departamento1 and Departamento2

t = -0.1765, df = 9, p-value = 0.8638

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

 -0.1381889 0.1181889

sample estimates:

mean of the differences

 -0.01

**Ejercicio 6 – Hoja 3**

> nivel1 <- c(14, 12, 15, 15, 11, 16, 17, 12, 14, 13, 18, 13, 18, 15, 16, 11)

> nivel2 <- c(20, 22, 18, 18, 19, 15, 18, 15, 22, 18, 19, 15, 21, 22, 18, 16)

> t.test(nivel1, nivel2, alternative = "two.sided")

 **Welch Two Sample t-test**

data: nivel1 and nivel2

t = -4.934, df = 29.841, p-value = 2.843e-05

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

 -5.832798 -2.417202

sample estimates:

mean of x mean of y

 14.375 18.500

> var.test(nivel1, nivel2, ratio = 1, alternative = "two.sided")

 **F test to compare two variances**

data: nivel1 and nivel2

F = 0.8639, num df = 15, denom df = 15, p-value = 0.7806

alternative hypothesis: true ratio of variances is not equal to 1

95 percent confidence interval:

 0.3018382 2.4725299

sample estimates:

ratio of variances

 0.8638889

> t.test(nivel1, nivel2, alternative = "two.sided", var.equal = TRUE)

 **Two Sample t-test**

data: nivel1 and nivel2

t = -4.934, df = 30, p-value = 2.807e-05

alternative hypothesis: true difference in means is not equal to 0

95 percent confidence interval:

 -5.832416 -2.417584

sample estimates:

mean of x mean of y

 14.375 18.500