Estadística (Q)
Clase práctica 21 - 2do. cuatrimestre 2016 - comandos y salidas de R

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para ej. 1.a)

```
> del<-scan()
1: 6.02 7.4 7.88 8.39 8.7 8.76 9.09 9.27 9.3 9.8 9.84 10.03 10.27
14:
Read 13 items
>
> obe<-scan()
1: 8.42 9.16 9.69 10.21 10.4 10.48 10.93 11.14 11.14 11.81
11:
Read 10 items
>
> shapiro.test(del)
        Shapiro-Wilk normality test
data: del
W = 0.921, p-value = 0.2587

> shapiro.test(obe)
        Shapiro-Wilk normality test
data: obe
W = 0.9637, p-value = 0.8275
```

para ej. 1b)

a mano

```
> qf(0.9,df1=12,df2=9)
[1] 2.378885
> qf(0.1,df1=12,df2=9)
[1] 0.4517682
```

con funcion de R

```
> var.test(del,obe,alternative="two.sided")
        F test to compare two variances
data: del and obe
F = 1.3678, num df = 12, denom df = 9, p-value = 0.6486
alternative hypothesis: true ratio of variances is not equal to 1
95 percent confidence interval:
0.3535866 4.6993807
sample estimates:
ratio of variances
1.367751
```

para ej. 2

a mano:

```
> x<-scan()
1: 7.2 4.3  5.8  6.5  4.9  6.8  6.3  7.0  6.5  6.2
11:
Read 10 items
>
> y<-scan()
1: 5.1 4.1  5.5  4.1  5.0  5.1  5.3  7.3  4.8  5.8
11:
Read 10 items
>
> mean(x)
[1] 6.15
> mean(y)
[1] 5.21

> qt(0.95,df=9)
[1] 1.833113

> d<-(x-y)
> d
[1] 2.1  0.2  0.3  2.4  -0.1  1.7  1.0  -0.3  1.7  0.4

> var(d)
[1] 0.9448889

> n<-length(d)
> t<-(mean(x)-mean(y))/sqrt(var(d)/n)
> t
[1] 3.058

> 1-pt(3.058,df=9)
[1] 0.006807792
```

con función de R:

```
> t.test(x,y,mu=0,alternative="greater",paired=T)
      Paired t-test
data: x and y
t = 3.058, df = 9, p-value = 0.006808
alternative hypothesis: true difference in means is greater than 0
95 percent confidence interval:
0.3765186 Inf
sample estimates:
mean of the differences
0.94
```

corroboramos el 0.94

```
> mean(x)-mean(y)
[1] 0.94
```

verifiquemos el supuesto de normalidad en las diferencias d=x-y:

```
> shapiro.test(x-y)
    Shapiro-Wilk normality test
data: x - y
W = 0.9155, p-value = 0.321
```

veamos que pasa para cada fórmula por separado:

```
> shapiro.test(x)
    Shapiro-Wilk normality test
data: x
W = 0.896, p-value = 0.1979
```

```
> shapiro.test(y)
    Shapiro-Wilk normality test
data: y
W = 0.8878, p-value = 0.1603
```