

Curso Livre II

Aluno: Manuel Ferreira Junior

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Modulo I

Tarefa 01

Pacote necessário

```
install.packages('TeachingDemos')  
library(TeachingDemos)
```

Questão 01:

$\alpha = 0.05$

$H_0: \mu \leq 42$

$H_1: \mu > 42$

Código :

```
> amos <- c(40.1,41.2,43.4,43.9,45.0,40.7,45.5,42.6,39.1,43.1,  
+          44.8,45.5,43.9,44.1,42.3,41.5,45.8,42.6,40.4,45.2,  
+          44.2,40.6,41.9,43.6,37.4,41.8,42.1,42.8,44.7,42.9,  
+          44.4,43.3,45.2,45.8,43.7,45.7)  
> alpha = 0.05  
> mu = 42  
>  
> q1th <- t.test(amos,conf.level = 1-alpha,alternative='great',mu=mu)  
> q1th
```

One Sample t-test

```
data: amos  
t = 3.1771, df = 35, p-value = 0.001552  
alternative hypothesis: true mean is greater than 42  
95 percent confidence interval:  
 42.50461      Inf  
sample estimates:  
mean of x  
 43.07778  
  
> q1th$p.value < alpha # True  
[1] TRUE
```

Analise :

Questão 02:

$\alpha = 0.10$

$H_0: \mu \geq 1200$

$H_1: \mu < 1200$

Código :

```
> amos <- c(1200, 1180, 1100, 1120, 900, 1160, 1250, 1140,
+           1300, 1190, 1290, 1110, 1100, 1100, 1060, 1220)
> alpha = 0.1
> mu = 1200
>
> q2th <- z.test(amos, mu, sd(amos), alternative = 'less', conf.level = 1 -
alpha)
> q2th$p.value < alpha # True
[1] TRUE
```

Analise :

Questão 03:

$\alpha = 0.05$

$H_0: \mu \geq 5$

$H_1: \mu < 5$

Código :

```
> amos <- c(4.0, 4.1, 4.7, 3.5, 4.2, 3.3, 6.1, 4.8, 3.7, 5.8, 4.7,
+           6.3, 5.4, 3.8, 5.7, 4.4, 4.8, 3.9, 4.9, 5.3, 4.6, 3.9,
+           45.5, 4.7, 5.1, 3.6, 4.1, 5.3, 3.5, 4.3)
> alpha = 0.05
> mu = 5
>
> q3th <- t.test(amos, conf.level = 1-alpha, alternative = 'less', mu=mu)
```

```
> q3th$p.value < alpha # False
[1] FALSE
```

Analise :

Questão 04:

$\alpha = 0.05$

$H_0: p \geq 0.50$

$H_1: p < 0.50$

Código :

```
> n = 703
> phat = 0.61
> p = 0.5
> # seja alpha = 0.05
> alpha = 0.05
> amos <- c(rep(1,round(n*phat)), rep(0,n*(1-phat)))
>
> q4th <- z.test(amos,mu=p,stde=sd(amos),conf.level = 1-alpha,
+               alternative = 'less')
>
> # Estatística do teste
> q4th$statistic
      Z
5.989166
```

Analise :

Questão 05:

$\alpha = 0.05$

$H_0: p = 0.01$

$H_1: p \neq 0.01$

Código :

```

> n = 1234
> phat = 20/1234
> p = 0.01
>
> alpha = 0.05
> amos <- c(rep(1,round(n*phat)), rep(0,n*(1-phat)))
>
> q5th <- z.test(amos,mu=p,stde=sd(amos),conf.level = 1-alpha)
>
> q5th$p.value < alpha # False
[1] FALSE

```

Analise :

Questão 06:

$\alpha = 0.05$

$H_0: \mu_x = \mu_y$

Código :

```

> x <- c(145,127,136,142,141,137)
> y <- c(143,128,132,138,142,132)
> alpha = 0.05
> q6th <- t.test(x,y,conf.level = 1 - alpha)
> q6th

Welch Two Sample t-test

data:  x and y
t = 0.60495, df = 9.9845, p-value = 0.5587
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -5.815291 10.148624
sample estimates:
mean of x mean of y
 138.0000  135.8333

> q6th$p.value < alpha # False
[1] FALSE

```

Analise :

Questão 07: **

 $\alpha = 0.05$
 $H_0: \mu_y \geq \mu_x$

Código :

```
> n1 = 200
> n2 = 100
> x = 60
> y = 50
> alpha = 0.05
>
> q7th <- prop.test(x=c(y, x), n=c(n2, n1),
+                  conf.level = 1 - alpha,
+                  alternative = 'less')
> q7th
```

2-sample test for equality of proportions with continuity correction

```
data: c(y, x) out of c(n2, n1)
X-squared = 10.638, df = 1, p-value = 0.9994
alternative hypothesis: less
95 percent confidence interval:
 -1.0000000 0.3055035
sample estimates:
prop 1 prop 2
 0.5   0.3

>
> q7th$p.value < alpha # False
[1] FALSE
```

Analise :

Questão 08:

 $\alpha = 0.1$
 $H_0: \mu_x = \mu_y$

Código :

```

> X <- c(-10,16,-8,9,5,-5,5,-11,25,25)
> Y <- c(-8,-3,20,22,3,5,10,14,-21,8)
> alpha = 0.1
>
> q8th <- t.test(X,Y,conf.level = 1-alpha)
> q8th

Welch Two Sample t-test

data:  X and Y
t = 0.016695, df = 17.964, p-value = 0.9869
alternative hypothesis: true difference in means is not equal to 0
90 percent confidence interval:
 -10.28768  10.48768
sample estimates:
mean of x mean of y
    5.1      5.0

> q8th$p.value < alpha
[1] FALSE

```

Analise :**Questão 09:**

$$\alpha = 0.05$$

$$H_0: \mu_x = \mu_y$$
Código :

```

> n1 = 100
> x = 12
> n2 = 120
> y = 18
> alpha = 0.05
>
> q9th <- prop.test(x=c(x, y), n=c(n1, n2),
+                  conf.level = 1 - alpha)
> q9th

2-sample test for equality of proportions with continuity correction

data:  c(x, y) out of c(n1, n2)
X-squared = 0.20102, df = 1, p-value = 0.6539
alternative hypothesis: two.sided

```

```

95 percent confidence interval:
-0.12937825  0.06937825
sample estimates:
prop 1 prop 2
 0.12   0.15

> q9th$p.value < alpha # False
[1] FALSE

```

Analise :

Questão 10:

$\alpha = 0.05$

H_0 😞 Gênero é independente da confiança na Polícia

H_1 😞 Gênero não é independente da confiança na Polícia

Código :

```

> alpha = 0.05
> db <- as.table(rbind(c(115, 56, 39),
+                       c(175, 94, 31)))
> dimnames(db) = list('Gênero' = c("Feminino",
+                                   "Masculino"),
+                      'Confiança na polícia' = c("Muita",
+                                                  "Alguma",
+                                                  "Muito pouca/Nenhuma"))
>
> q10chq <- chisq.test(db)
> q10chq

Pearson's Chi-squared test

data:  db
X-squared = 7.2997, df = 2, p-value = 0.02599

> q10chq$p.value < alpha # True
[1] TRUE

```

Analise :

Questão 11:

$\alpha = 0.05$

H_0 😞 Opinião sobre o produto é independente do número de tentativas

H_1 😞 Opinião sobre o produto não é independente do número de tentativas

Código :

```
> alpha = 0.05
> db <- as.table(rbind(c(62, 36, 12),
+                       c(84, 42, 14),
+                       c(24, 22, 24)))
> dimnames(db) = list('Opinião do produto' = c("Excelente",
+                                               "Satisfatório",
+                                               "Insatisfatório"),
+                      'Número de tentativas' = c("1 Tentativa",
+                                                  "2 Tentativas",
+                                                  "3 Tentativas"))
>
> q11chq <- chisq.test(db)
> q11chq

Pearson's Chi-squared test

data:  db
X-squared = 26.288, df = 4, p-value = 2.768e-05

> q11chq$p.value < alpha # True
[1] TRUE
```

Analise :

Questão 12:

$\alpha = 0.05$

H_0 😞 O tratamento é independente da Reação

H_1 😞 O tratamento não é independente da Reação

Código :

```
> alpha = 0.05
> db <- as.table(rbind(c(43, 35),
```



```

+               c(109, 118)))
> dimnames(db) = list('Reação' = c("Irritação",
+                                   "Nenhuma Irritação"),
+                     'Tratamento' = c("Remedio",
+                                       "Placebo"))
>
> q12chq <- chisq.test(db)
> q12chq

Pearson's Chi-squared test with Yates' continuity correction

data:  db
X-squared = 0.90687, df = 1, p-value = 0.3409

> q12chq$p.value < alpha # False, não rejeita h0
[1] FALSE

```

Analise :**Questão 13:**

$\alpha = 0.01$

H_0 😞 $\mu_{wf} \geq \mu_f$

H_1 😞 $\mu_{wf} < \mu_f$

Código :

```

> alpha = 0.01
> wf <- c(2.19, 2.39, 2., 7.99, 1.98, 4.99, 1.79, 1.69, 2.19, 1.99)
> f <- c(1.35, 1.69, 2.49, 6.99, 1.29, 3.69, 1.33, 1.49, 1.49, 1.59)
>
> q13th <- t.test(wf, f, conf.level = 1 - alpha, alternative='less')
> q13th

Welch Two Sample t-test

data:  wf and f
t = 0.67873, df = 17.755, p-value = 0.747
alternative hypothesis: true difference in means is less than 0
99 percent confidence interval:
 -Inf 2.764016
sample estimates:
mean of x mean of y
 2.92      2.34

```

```
> q13th$p.value < alpha # False, não rejeita h0
[1] FALSE
```

Analise :

Questão 14:

$\alpha = 0.01$

$H_0: \mu_{\text{after}} \leq \mu_{\text{before}}$

$H_1: \mu_{\text{after}} > \mu_{\text{before}}$

Código :

```
> alpha = 0.01
> before <- c(37.5,36,39,38,37.8,38.5,36.9,39.4,37.2,38.1,
+             39.3,37.5,38.5,39,36.9,37,38.5,39,36.2,36.8)
> after <- c(37.8,36.4,37.6,37.2,36.9,37.7,36.8,38.1,36.7,
+            37.3,38,37.1,36.6,37.5,37,36.2,37.6,36.8,36.4,
+            36.8)
> q14th = t.test(after, before, conf.level = 1-alpha, alternative='greater')
> q14th
```

Welch Two Sample t-test

data: after and before

t = -2.7829, df = 29.164, p-value = 0.9953

alternative hypothesis: true difference in means is greater than 0

99 percent confidence interval:

-1.375608 Inf

sample estimates:

mean of x mean of y

37.125 37.855

```
> q14th$p.value < alpha # False, não rejeita h0
[1] FALSE
```

Analise :