Teste do sinal

```
# 1. Tabela 3.11, p. 83, em Hollander & Wolf (1999, 2nd ed.)
# H1 unilateral à direita
teta0 <- 175
x <- c(254, 171, 345, 134, 190, 447, 106, 173, 449, 198)
n <- length(x)
cat("\n Tamanho da amostra:", n, "\n")

  Tamanho da amostra: 10

B <- sum(x > teta0)
cat("\n B =", B,"\n")

  B = 6

# Dist. exata (default: p = 1/2)
(binom.test(B, n, alternative = "greater"))

      Exact binomial test

data:  B and n
number of successes = 6, number of trials = 10,
p-value = 0.377
alternative hypothesis: true probability of success is greater than 0.5


# Valor-p com a dist. de B (pbinom)
cat("\n B =", B, "(p =", pbinom(B - 1, n, prob = 0.5, lower.tail = FALSE),
")")

   B = 6 (p = 0.3769531 )


# Dist. aproximada com e sem correção de continuidade
(prop.test(B, n, p = 0.5, alternative = "greater", correct = TRUE))

      1-sample proportions test with continuity
      correction

data:  B out of n, null probability 0.5
X-squared = 0.1, df = 1, p-value = 0.3759
alternative hypothesis: true p is greater than 0.5

(prop.test(B, n, p = 0.5, alternative = "greater", correct = FALSE))

      1-sample proportions test without continuity
      correction

data:  B out of n, null probability 0.5
X-squared = 0.4, df = 1, p-value = 0.2635
alternative hypothesis: true p is greater than 0.5
```

```
# 2. Tabela 3.9, p. 82, em Hollander & Wolf (1999, 2nd ed.)
# H1 bilateral
teta0 <- 18
x <- c(17.4, 17.9, 17.6, 18.1, 17.6, 18.9, 16.9, 17.5, 17.8, 17.4, 24.6,
26.0)
n <- length(x)
cat("\n Tamanho da amostra:", n, "\n")

 Tamanho da amostra: 12

B <- sum(x > teta0)
cat("\n B =", B,"\n")

 B = 4

# Dist. exata
(binom.test(B, n, alternative = "two.side"))

     Exact binomial test

data:  B and n
number of successes = 4, number of trials = 12, p-value = 0.3877
alternative hypothesis: true probability of success is not equal to 0.5

# Estimativa pontual de teta
cat("\n Mediana amostral =", median(x), "\n")

  Mediana amostral = 17.7

# IC para teta
alfa <- 0.05
calfa <- n + 1 - qbinom(1 - alfa / 2, n, prob = 0.5)
xs <- sort(x)
cat("\n IC de", 100 * (1 - alfa),"% para teta: (", xs[calfa], ",",
    xs[n + 1 - calfa], ") \n")

  IC de 95 % para teta: ( 17.5 , 18.1 )

# Dist. aproximada com e sem correção de continuidade
(prop.test(B, n, p = 0.5, alternative = "two.side", correct = TRUE))

     1-sample proportions test with continuity
     correction

data:  B out of n, null probability 0.5
X-squared = 0.75, df = 1, p-value = 0.3865
alternative hypothesis: true p is not equal to 0.5

(prop.test(B, n, p = 0.5, alternative = "two.side", correct = FALSE))
```

```
	1-sample proportions test without continuity
	correction

data:  B out of n, null probability 0.5
X-squared = 1.3333, df = 1, p-value = 0.2482
alternative hypothesis: true p is not equal to 0.5
```

Nota 1. Utilizando os dados do exemplo 2, efetue o teste com $\theta_0 = 18{,}1$.

Nota 2. Teste as hipóteses dos exemplos 1 e 2 utilizando os testes de Wilcoxon e *t* de Student. Alguma diferença nas suas conclusões?

Nota 3. O código em SAS abaixo utiliza a `proc univariate`. Execute as linhas em SAS e compare com os resultados obtidos em R.

```
title "Exemplo 2";
data exemplo2;
input x2 @@;
datalines;
17.4 17.9 17.6 18.1 17.6 18.9 16.9 17.5 17.8 17.4 24.6 26.0;
proc univariate data = exemplo2 loccount mu0 = 18;
  var x2;
run;
```