ParaTest

Guillem

6 de febrero de 2020

Contraste de μ de normal con σ desconocida con t.test

```
# el parámetro alternative puede tomar tres valores: "two.sided" (por defecto, bilateral), "less" (mu <

set.seed(2020)
flores_ele <- sample(1:150, 40, replace = TRUE)

long_sep_mue <- iris[flores_ele,]$Sepal.Length

t.test(long_sep_mue, mu = 5.7, conf.level = 0.95, alternative = "greater")
```

```
##
##  One Sample t-test
##
## data:  long_sep_mue
## t = 2.5864, df = 39, p-value = 0.006773
## alternative hypothesis: true mean is greater than 5.7
## 95 percent confidence interval:
##  5.816769      Inf
## sample estimates:
## mean of x
##     6.035
```

```
test_t <- t.test(long_sep_mue, mu = 5.7, conf.level = 0.95, alternative = "greater")

test_t$conf.int
```

```
## [1] 5.816769      Inf
## attr(,"conf.level")
## [1] 0.95
```

```
test_t$p.value
```

```
## [1] 0.006772975
```

Contrates de proporciones p con binom.test

```
binom.test(21, 25, p=0.8,alternative = "greater", conf.leve = 0.95)
```

```
##
##  Exact binomial test
##
## data:  21 and 25
## number of successes = 21, number of trials = 25, p-value = 0.4207
## alternative hypothesis: true probability of success is greater than 0.8
## 95 percent confidence interval:
##  0.6703917 1.0000000
```

```
## sample estimates:
## probability of success
##                   0.84
```

```
library(MASS)
birthwt
```

```
##     low age lwt race smoke ptl ht ui ftv  bwt
## 85    0  19 182    2     0   0  0  1   0 2523
## 86    0  33 155    3     0   0  0  0   3 2551
## 87    0  20 105    1     1   0  0  0   1 2557
## 88    0  21 108    1     1   0  0  1   2 2594
## 89    0  18 107    1     1   0  0  1   0 2600
## 91    0  21 124    3     0   0  0  0   0 2622
## 92    0  22 118    1     0   0  0  0   1 2637
## 93    0  17 103    3     0   0  0  0   1 2637
## 94    0  29 123    1     1   0  0  0   1 2663
## 95    0  26 113    1     1   0  0  0   0 2665
## 96    0  19  95    3     0   0  0  0   0 2722
## 97    0  19 150    3     0   0  0  0   1 2733
## 98    0  22  95    3     0   0  1  0   0 2751
## 99    0  30 107    3     0   1  0  1   2 2750
## 100   0  18 100    1     1   0  0  0   0 2769
## 101   0  18 100    1     1   0  0  0   0 2769
## 102   0  15  98    2     0   0  0  0   0 2778
## 103   0  25 118    1     1   0  0  0   3 2782
## 104   0  20 120    3     0   0  0  1   0 2807
## 105   0  28 120    1     1   0  0  0   1 2821
## 106   0  32 121    3     0   0  0  0   2 2835
## 107   0  31 100    1     0   0  0  1   3 2835
## 108   0  36 202    1     0   0  0  0   1 2836
## 109   0  28 120    3     0   0  0  0   0 2863
## 111   0  25 120    3     0   0  0  1   2 2877
## 112   0  28 167    1     0   0  0  0   0 2877
## 113   0  17 122    1     1   0  0  0   0 2906
## 114   0  29 150    1     0   0  0  0   2 2920
## 115   0  26 168    2     1   0  0  0   0 2920
## 116   0  17 113    2     0   0  0  0   1 2920
## 117   0  17 113    2     0   0  0  0   1 2920
## 118   0  24  90    1     1   1  0  0   1 2948
## 119   0  35 121    2     1   1  0  0   1 2948
## 120   0  25 155    1     0   0  0  0   1 2977
## 121   0  25 125    2     0   0  0  0   0 2977
## 123   0  29 140    1     1   0  0  0   2 2977
## 124   0  19 138    1     1   0  0  0   2 2977
## 125   0  27 124    1     1   0  0  0   0 2922
## 126   0  31 215    1     1   0  0  0   2 3005
## 127   0  33 109    1     1   0  0  0   1 3033
## 128   0  21 185    2     1   0  0  0   2 3042
## 129   0  19 189    1     0   0  0  0   2 3062
## 130   0  23 130    2     0   0  0  0   1 3062
## 131   0  21 160    1     0   0  0  0   0 3062
## 132   0  18  90    1     1   0  0  1   0 3062
## 133   0  18  90    1     1   0  0  1   0 3062
## 134   0  32 132    1     0   0  0  0   4 3080
```

```
## 135   0  19 132     3      0    0  0  0    0 3090
## 136   0  24 115     1      0    0  0  0    2 3090
## 137   0  22  85     3      1    0  0  0    0 3090
## 138   0  22 120     1      0    0  1  0    1 3100
## 139   0  23 128     3      0    0  0  0    0 3104
## 140   0  22 130     1      1    0  0  0    0 3132
## 141   0  30  95     1      1    0  0  0    2 3147
## 142   0  19 115     3      0    0  0  0    0 3175
## 143   0  16 110     3      0    0  0  0    0 3175
## 144   0  21 110     3      1    0  0  1    0 3203
## 145   0  30 153     3      0    0  0  0    0 3203
## 146   0  20 103     3      0    0  0  0    0 3203
## 147   0  17 119     3      0    0  0  0    0 3225
## 148   0  17 119     3      0    0  0  0    0 3225
## 149   0  23 119     3      0    0  0  0    2 3232
## 150   0  24 110     3      0    0  0  0    0 3232
## 151   0  28 140     1      0    0  0  0    0 3234
## 154   0  26 133     3      1    2  0  0    0 3260
## 155   0  20 169     3      0    1  0  1    1 3274
## 156   0  24 115     3      0    0  0  0    2 3274
## 159   0  28 250     3      1    0  0  0    6 3303
## 160   0  20 141     1      0    2  0  1    1 3317
## 161   0  22 158     2      0    1  0  0    2 3317
## 162   0  22 112     1      1    2  0  0    0 3317
## 163   0  31 150     3      1    0  0  0    2 3321
## 164   0  23 115     3      1    0  0  0    1 3331
## 166   0  16 112     2      0    0  0  0    0 3374
## 167   0  16 135     1      1    0  0  0    0 3374
## 168   0  18 229     2      0    0  0  0    0 3402
## 169   0  25 140     1      0    0  0  0    1 3416
## 170   0  32 134     1      1    1  0  0    4 3430
## 172   0  20 121     2      1    0  0  0    0 3444
## 173   0  23 190     1      0    0  0  0    0 3459
## 174   0  22 131     1      0    0  0  0    1 3460
## 175   0  32 170     1      0    0  0  0    0 3473
## 176   0  30 110     3      0    0  0  0    0 3544
## 177   0  20 127     3      0    0  0  0    0 3487
## 179   0  23 123     3      0    0  0  0    0 3544
## 180   0  17 120     3      1    0  0  0    0 3572
## 181   0  19 105     3      0    0  0  0    0 3572
## 182   0  23 130     1      0    0  0  0    0 3586
## 183   0  36 175     1      0    0  0  0    0 3600
## 184   0  22 125     1      0    0  0  0    1 3614
## 185   0  24 133     1      0    0  0  0    0 3614
## 186   0  21 134     3      0    0  0  0    2 3629
## 187   0  19 235     1      1    0  1  0    0 3629
## 188   0  25  95     1      1    3  0  1    0 3637
## 189   0  16 135     1      1    0  0  0    0 3643
## 190   0  29 135     1      0    0  0  0    1 3651
## 191   0  29 154     1      0    0  0  0    1 3651
## 192   0  19 147     1      1    0  0  0    0 3651
## 193   0  19 147     1      1    0  0  0    0 3651
## 195   0  30 137     1      0    0  0  0    1 3699
## 196   0  24 110     1      0    0  0  0    1 3728
```

```
## 197   0  19 184     1      1    0  1  0    0 3756
## 199   0  24 110     3      0    1  0  0    0 3770
## 200   0  23 110     1      0    0  0  0    1 3770
## 201   0  20 120     3      0    0  0  0    0 3770
## 202   0  25 241     2      0    0  1  0    0 3790
## 203   0  30 112     1      0    0  0  0    1 3799
## 204   0  22 169     1      0    0  0  0    0 3827
## 205   0  18 120     1      1    0  0  0    2 3856
## 206   0  16 170     2      0    0  0  0    4 3860
## 207   0  32 186     1      0    0  0  0    2 3860
## 208   0  18 120     3      0    0  0  0    1 3884
## 209   0  29 130     1      1    0  0  0    2 3884
## 210   0  33 117     1      0    0  0  1    1 3912
## 211   0  20 170     1      1    0  0  0    0 3940
## 212   0  28 134     3      0    0  0  0    1 3941
## 213   0  14 135     1      0    0  0  0    0 3941
## 214   0  28 130     3      0    0  0  0    0 3969
## 215   0  25 120     1      0    0  0  0    2 3983
## 216   0  16  95     3      0    0  0  0    1 3997
## 217   0  20 158     1      0    0  0  0    1 3997
## 218   0  26 160     3      0    0  0  0    0 4054
## 219   0  21 115     1      0    0  0  0    1 4054
## 220   0  22 129     1      0    0  0  0    0 4111
## 221   0  25 130     1      0    0  0  0    2 4153
## 222   0  31 120     1      0    0  0  0    2 4167
## 223   0  35 170     1      0    1  0  0    1 4174
## 224   0  19 120     1      1    0  0  0    0 4238
## 225   0  24 116     1      0    0  0  0    1 4593
## 226   0  45 123     1      0    0  0  0    1 4990
## 4     1  28 120     3      1    1  0  1    0  709
## 10    1  29 130     1      0    0  0  1    2 1021
## 11    1  34 187     2      1    0  1  0    0 1135
## 13    1  25 105     3      0    1  1  0    0 1330
## 15    1  25  85     3      0    0  0  1    0 1474
## 16    1  27 150     3      0    0  0  0    0 1588
## 17    1  23  97     3      0    0  0  1    1 1588
## 18    1  24 128     2      0    1  0  0    1 1701
## 19    1  24 132     3      0    0  1  0    0 1729
## 20    1  21 165     1      1    0  1  0    1 1790
## 22    1  32 105     1      1    0  0  0    0 1818
## 23    1  19  91     1      1    2  0  1    0 1885
## 24    1  25 115     3      0    0  0  0    0 1893
## 25    1  16 130     3      0    0  0  0    1 1899
## 26    1  25  92     1      1    0  0  0    0 1928
## 27    1  20 150     1      1    0  0  0    2 1928
## 28    1  21 200     2      0    0  0  1    2 1928
## 29    1  24 155     1      1    1  0  0    0 1936
## 30    1  21 103     3      0    0  0  0    0 1970
## 31    1  20 125     3      0    0  0  1    0 2055
## 32    1  25  89     3      0    2  0  0    1 2055
## 33    1  19 102     1      0    0  0  0    2 2082
## 34    1  19 112     1      1    0  0  1    0 2084
## 35    1  26 117     1      1    1  0  0    0 2084
## 36    1  24 138     1      0    0  0  0    0 2100
```

```
## 37    1  17 130    3     1   1  0  1   0 2125
## 40    1  20 120    2     1   0  0  0   3 2126
## 42    1  22 130    1     1   1  0  1   1 2187
## 43    1  27 130    2     0   0  0  1   0 2187
## 44    1  20  80    3     1   0  0  1   0 2211
## 45    1  17 110    1     1   0  0  0   0 2225
## 46    1  25 105    3     0   1  0  0   1 2240
## 47    1  20 109    3     0   0  0  0   0 2240
## 49    1  18 148    3     0   0  0  0   0 2282
## 50    1  18 110    2     1   1  0  0   0 2296
## 51    1  20 121    1     1   1  0  1   0 2296
## 52    1  21 100    3     0   1  0  0   4 2301
## 54    1  26  96    3     0   0  0  0   0 2325
## 56    1  31 102    1     1   1  0  0   1 2353
## 57    1  15 110    1     0   0  0  0   0 2353
## 59    1  23 187    2     1   0  0  0   1 2367
## 60    1  20 122    2     1   0  0  0   0 2381
## 61    1  24 105    2     1   0  0  0   0 2381
## 62    1  15 115    3     0   0  0  1   0 2381
## 63    1  23 120    3     0   0  0  0   0 2410
## 65    1  30 142    1     1   1  0  0   0 2410
## 67    1  22 130    1     1   0  0  0   1 2410
## 68    1  17 120    1     1   0  0  0   3 2414
## 69    1  23 110    1     1   1  0  0   0 2424
## 71    1  17 120    2     0   0  0  0   2 2438
## 75    1  26 154    3     0   1  1  0   1 2442
## 76    1  20 105    3     0   0  0  0   3 2450
## 77    1  26 190    1     1   0  0  0   0 2466
## 78    1  14 101    3     1   1  0  0   0 2466
## 79    1  28  95    1     1   0  0  0   2 2466
## 81    1  14 100    3     0   0  0  0   2 2495
## 82    1  23  94    3     1   0  0  0   0 2495
## 83    1  17 142    2     0   0  1  0   0 2495
## 84    1  21 130    1     1   0  1  0   3 2495
```

```r
set.seed(1001)
madres_elegidas <- sample(1:189,40, replace = TRUE)
muestra_madres <- birthwt[madres_elegidas,]

x <- table(muestra_madres$smoke)[2]

binom.test(x,length(madres_elegidas), p=0.3, alternative = "greater")
```

```
##
##  Exact binomial test
##
## data:  x and length(madres_elegidas)
## number of successes = 17, number of trials = 40, p-value = 0.06331
## alternative hypothesis: true probability of success is greater than 0.3
## 95 percent confidence interval:
##  0.2918466 1.0000000
## sample estimates:
## probability of success
##                  0.425
```

Rechazaremos la H_0 ya que el p_valor es menor a 0.05 que es el nivel de significación que hemos elegido