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1: > #This is my attempt to do the worksheets that I
2: > # left for students to use.
3: > #
4: > # Two Populations: sigma known
5: >
6: > # Case 1 through 5 have us doing confidence intervalus on
7: > # the difference of two means. Let me start by loading
8: > # the function into the environment
9: >
10: > source("../ci_2known.R")
11: >
12: > # Case 1;
13: > # I will store the required values in variables just so that
14: > # it is clear which values go where in the function
15: > sigma_1 <- 7.06
16: > n_1 <-38
17: > xbar_1 <- 76.95
18: > sigma_2 <- 8.82
19: > n_2 <- 51
20: > xbar_2 <- 71.24
21: > ci_2known( sigma_1, n_1, xbar_1,
22: +           sigma_2, n_2, xbar_2, 0.92 )
23:   CI Low   CI High Pnt. Est. St. Error   M of E   alpha/2   z-score
24: 2.761242  8.658758  5.710000  1.684344  2.948758  0.040000  1.750686
25: > #
26: > #
27: > # Case 2
28: > sigma_1 <- 5.47
29: > n_1 <-44
30: > xbar_1 <- 80.66
31: > sigma_2 <- 8.67
32: > n_2 <- 45
33: > xbar_2 <- 86.18
34: > ci_2known( sigma_1, n_1, xbar_1,
35: +           sigma_2, n_2, xbar_2, 0.99)
36:   CI Low   CI High Pnt. Est. St. Error   M of E   alpha/2   z-score
37: -9.469042 -1.570958 -5.520000  1.533115  3.949042  0.005000  2.575829
38: > #
39: > #
40: > # Case 3
41: > sigma_1 <- 8.86
42: > n_1 <-72
43: > xbar_1 <- 77.35
44: > sigma_2 <- 11.18
45: > n_2 <- 47
46: > xbar_2 <- 82.57
47: > ci_2known( sigma_1, n_1, xbar_1,
48: +           sigma_2, n_2, xbar_2, 0.995 )
49:   CI Low   CI High Pnt. Est. St. Error   M of E   alpha/2
50: -10.6555692  0.2155692  -5.2200000  1.9364103  5.4355692  0.0025000
51:   z-score
52: 2.8070338
53: > #
54: > #
55: > # Case 4
56: > sigma_1 <- 5.1
57: > sigma_2 <- 6.5
58: > # now we need to load gnrnd4 so that we can use it to generate the
59: > # values in the table
60: > source("../gnrnd4.R")

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61: > # then we can generate the desired values of the first table
62: > gnrnd4(1895785504,5100746)
63: style= 4   size= 56   seed= 89578   num digits= 1   alt_sign= 1
64: [1] "DONE "
65: > # and now, we will look at the first and last six values
66: > # just to be sure we have the right values
67: > head(L1)
68: [1] 79.5 70.1 72.3 68.0 78.3 75.4
69: > tail(L1)
70: [1] 73.8 70.2 87.9 84.1 73.3 77.8
71: > #
72: > n_1 <- length( L1 )
73: > xbar_1 <- mean( L1 )
74: > #
75: > # then generate the second table of values, remember that this
76: > # will overwrite L1
77: > gnrnd4(1943827604,6500689)
78: style= 4   size= 77   seed= 94382   num digits= 1   alt_sign= 1
79: [1] "DONE "
80: > # and now, we will look at the first and last six values
81: > # just to be sure we have the right values
82: > head(L1)
83: [1] 60.6 65.8 72.6 59.4 75.3 68.9
84: > tail(L1)
85: [1] 76.8 62.2 76.8 72.3 67.7 68.1
86: > #
87: > n_2 <- length( L1 )
88: > xbar_2 <- mean( L1 )
89: > #
90: > # first sample size and mean
91: > n_1
92: [1] 56
93: > xbar_1
94: [1] 75.06429
95: > #second sample size and mean
96: > n_2
97: [1] 77
98: > xbar_2
99: [1] 68.42857
100: > #
101: > ci_2known( sigma_1, n_1, xbar_1,
102: +           sigma_2, n_2, xbar_2, 0.895 )
103:   CI Low   CI High Pnt. Est. St. Error   M of E   alpha/2   z-score
104: 5.003996  8.267433  6.635714  1.006561  1.631719  0.052500  1.621082
105: >
106: > #
107: > #
108: > # Case 5
109: > sigma_1 <- 6.4
110: > sigma_2 <- 9.3
111: > #
112: > # then we can generate the desired values of the first table
113: > gnrnd4(6128867204,6400432)
114: style= 4   size= 73   seed= 12886   num digits= 1   alt_sign= -1
115: [1] "DONE "
116: > # and now, we will look at the first and last six values
117: > # just to be sure we have the right values
118: > head(L1)
119: [1] -57.0 -42.0 -42.9 -46.8 -48.3 -30.7
120: > tail(L1)

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121: [1] -37.5 -40.2 -55.4 -32.1 -43.6 -48.8
122: > #
123: > n_1 <- length( L1 )
124: > xbar_1 <- mean( L1 )
125: > #
126: > # then generate the second table of values, remember that this
127: > # will overwrite L1
128: > gnrnd4(6179647104,9300514)
129: style= 4 size= 72 seed= 17964 num digits= 1 alt_sign= -1
130: [1] "DONE "
131: > # and now, we will look at the first and last six values
132: > # just to be sure we have the right values
133: > head(L1)
134: [1] -39.3 -42.4 -56.9 -51.3 -51.5 -45.5
135: > tail(L1)
136: [1] -50.3 -61.9 -69.8 -53.8 -40.1 -61.1
137: > #
138: > n_2 <- length( L1 )
139: > xbar_2 <- mean( L1 )
140: > #
141: > # first sample size and mean
142: > n_1
143: [1] 73
144: > xbar_1
145: [1] -44.28493
146: > #second sample size and mean
147: > n_2
148: [1] 72
149: > xbar_2
150: [1] -52.05556
151: > #
152: > ci_2known( sigma_1, n_1, xbar_1,
153: + sigma_2, n_2, xbar_2, 0.815 )
154: CI Low CI High Pnt. Est. St. Error M of E alpha/2 z-score
155: 6.010957 9.530292 7.770624 1.327534 1.759668 0.092500 1.325516
156: >
157: > # Starting with Case 6 we are looking at a test of a
158: > # hypothesis the the two means are equal. We will need to
159: > # put our function into the environment
160: > #
161: > # Case 6
162: > #
163: > source("../hypo_2known.R")
164: > sigma_1 <- 5.70
165: > sigma_2 <- 8.34
166: > # set h_type -1 for <, 0 for !=, 1 for > on alternative
167: > h_type <- -1
168: > alpha <- 0.03
169: > n_1 <- 58
170: > xbar_1 <- 79.16
171: > n_2 <- 65
172: > xbar_2 <- 81.73
173: > #
174: > # then run the function
175: > #
176: > hypoth_2test_known(sigma_1, n_1, xbar_1,
177: + sigma_2, n_2, xbar_2,
178: + h_type, alpha )
179: H1: sigma_one n_one
180: "mu_1 < mu_2" "5.7" "58"

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181:          mean_one          sigma_two          n_two
182:          "79.16"          "8.34"          "65"
183:          mean_two          std. err.          difference
184:          "81.73"          "1.27681579236758"  "-2.570000000000001"
185:          sig level          z          critical low
186:          "0.03"          "1.88079360815125"  "-2.40142698107152"
187:          critical high          attained          decision
188:          "n.a." "0.0220667995131511"          "Reject"
189: >
190: > #
191: > # Case 7
192: > #
193: > sigma_1 <- 12.04
194: > sigma_2 <- 15.15
195: > # set h_type -1 for <, 0 for !=, 1 for > on alternative
196: > h_type <- 1
197: > alpha <- 0.02
198: > n_1 <- 43
199: > xbar_1 <- 87.86
200: > n_2 <- 42
201: > xbar_2 <- 81.27
202: > #
203: > # then run the function
204: > #
205: > hypoth_2test_known(sigma_1, n_1, xbar_1,
206: +                   sigma_2, n_2, xbar_2,
207: +                   h_type, alpha )
208:          H1:          sigma_one          n_one
209:          "mu_1 > mu_2"          "12.04"          "43"
210:          mean_one          sigma_two          n_two
211:          "87.86"          "15.15"          "42"
212:          mean_two          std. err.          difference
213:          "81.27"          "2.97254460497592"  "6.59"
214:          sig level          z          critical low
215:          "0.02"          "2.05374891063182"  "n.a."
216:          critical high          attained          decision
217:          "6.10486024427379" "0.0133130560707313"  "Reject"
218: > #
219: > # Case 8
220: > #
221: > sigma_1 <- 8.80
222: > sigma_2 <- 10.60
223: > # set h_type -1 for <, 0 for !=, 1 for > on alternative
224: > h_type <- -1
225: > alpha <- 0.035
226: > # generate first sample
227: > gnrnd4(1177104204,8801266)
228: style= 4   size= 43   seed= 17710   num digits= 1   alt_sign= 1
229: [1] "DONE "
230: > #look at its head and tail for confirmation
231: > head(L1)
232: [1] 139.4 120.0 123.0 123.4 115.9 121.6
233: > tail(L1)
234: [1] 134.7 133.3 129.5 130.2 138.0 128.0
235: > #
236: > n_1 <- length(L1)
237: > xbar_1 <- mean( L1 )
238: > #sample 1 length and mean
239: > n_1
240: [1] 43

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241: > xbar_1
242: [1] 127.6442
243: > # generate second sample
244: > gnrnd4(1903894404,10601312)
245: style= 4    size= 45    seed= 90389    num digits= 1    alt_sign= 1
246: [1] "DONE "
247: > #look at its head and tail for confirmation
248: > head(L1)
249: [1] 135.6 132.6 118.9 155.9 109.9 133.0
250: > tail(L1)
251: [1] 125.5 131.0 139.0 130.3 127.3 119.9
252: > #
253: > n_2 <- length(L1)
254: > xbar_2 <- mean( L1 )
255: > #sample 2 length and mean
256: > n_2
257: [1] 45
258: > xbar_2
259: [1] 131.44
260: > #
261: > # then run the function
262: > #
263: > hypoth_2test_known(sigma_1, n_1, xbar_1,
264: +                      sigma_2, n_2, xbar_2,
265: +                      h_type, alpha )
266:           H1:           sigma_one           n_one
267:           "mu_1 < mu_2"           "8.8"           "43"
268:           mean_one           sigma_two           n_two
269:           "127.644186046512"           "10.6"           "45"
270:           mean_two           std. err.           difference
271:           "131.44"           "2.07311821212564"           "-3.79581395348838"
272:           sig level           z           critical low
273:           "0.035"           "1.8119106729526"           "-3.75630501484286"
274:           critical high           attained           decision
275:           "n.a."           "0.0335526292660019"           "Reject"
276: >

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