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> #This is my attempt to do the worksheet on hypothesis
> # testing for 1 population, sigma unknown
> #
> # One Population: sigma unknown
>
> # we need to put the functin hypoth_test_unknown() into our
> # environment
>
> source("../hypo_unknown.R")
>
> # Case 1;
> #  I will store the required values in variables just so that
> # it is clear which values go where in the function
>
> n_1 <- 41
> df <- n_1 - 1
> H_0 <- 79.29
> H_type <- 0    # -1 for <, 0 or !=, 1 for >
> alpha <- 0.025
> #  since this is a two tailed test use half alpha
> #      for our computation
> z <- qt( alpha/2, df, lower.tail=FALSE)
> z
[1] 2.328935
> xbar_1 <- 75.59
> s_1 <- 9.08
> #
> hypoth_test_unknown( H_0, H_type,
+                     alpha, n_1, xbar_1, s_1  )
              H0_mu                    H1:           std. error
           "79.29"       "mu !=  79.29"   "1.41805775794854"
                 n            sig level                    t
              "41"              "0.025"   "2.32893476756911"
          samp mean           samp stdev           test stat
            "75.59"               "9.08"  "-2.60920260776449"
            how far         critical low        critical high
  "3.30256401490747"   "75.9874359850925"   "82.5925640149075"
           attained             decision
"0.0127039721853674"             "Reject"
> #
> # Case 2
> #
> n_1 <- 38
> df <- n_1 - 1
> H_0 <- 187.86
> H_type <- -1   # -1 for <, 0 or !=, 1 for >
> alpha <- 0.040
> #  since this is a one tailed test use alpha
> #      for our computation
> z <- qt( alpha, df, lower.tail=FALSE)
> z
[1] 1.800116
> xbar_1 <- 186.44
> s_1 <- 6.86
> #
> hypoth_test_unknown( H_0, H_type,
+                     alpha, n_1, xbar_1, s_1  )
             H0_mu                 H1:           std. error
          "187.86"      "mu <  187.86"  "1.11283894895703"
                 n           sig level                    t
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              "38"              "0.04"  "1.80011603826346"
          samp mean          samp stdev           test stat
           "186.44"              "6.86" "-1.27601572656211"
           how far        critical low       critical high
 "2.00323924002181"  "185.856760759978"              "n.a."
          attained            decision
"0.104951133761321"     "do not reject"
> #
> # Case 3
> #
> n_1 <- 16
> df <- n_1 - 1
> H_0 <- 16.46
> H_type <-  -1    # -1 for <, 0 or !=, 1 for >
> alpha <- 0.025
> #  since this is a one tailed test use  alpha
> #      for our computation
> z <- qt( alpha, df, lower.tail=FALSE)
> z
[1] 2.13145
> xbar_1 <- 13.36
> s_1 <- 5.49
> #
> hypoth_test_unknown( H_0, H_type,
+                      alpha, n_1, xbar_1, s_1  )
               H0_mu                  H1:           std. error
             "16.46"       "mu <  16.46"             "1.3725"
                  n           sig level                    t
               "16"             "0.025"   "2.13144954555978"
          samp mean          samp stdev            test stat
            "13.36"             "5.49"  "-2.25865209471767"
            how far        critical low       critical high
  "2.92541450128079"   "13.5345854987192"              "n.a."
           attained            decision
"0.0196150918803391"            "Reject"
> #
> #
> # Case 4
> #
> n_1 <- 26
> df <- n_1 - 1
> H_0 <- -15.92
> H_type <-  1    # -1 for <, 0 or !=, 1 for >
> alpha <- 0.035
> #  since this is a one tailed test use  alpha
> #      for our computation
> z <- qt( alpha, df, lower.tail=FALSE)
> z
[1] 1.892928
> xbar_1 <- -13.45
> s_1 <- 7.39
> #
> hypoth_test_unknown( H_0, H_type,
+                      alpha, n_1, xbar_1, s_1  )
               H0_mu                  H1:           std. error
            "-15.92"       "mu >  -15.92"   "1.44929823867118"
                  n           sig level                    t
               "26"             "0.035"   "1.89292802721271"
          samp mean          samp stdev            test stat
           "-13.45"             "7.39"    "1.7042730985892"
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             how far         critical low        critical high
  "2.74341725577069"              "n.a."  "-13.1765827442293"
            attained            decision
"0.0503648619398176"      "do not reject"
> #
> #
> # Case 5
> #
> n_1 <- 18
> df <- n_1 - 1
> H_0 <- -91.13
> H_type <-  1    # -1 for <, 0 or !=, 1 for >
> alpha <- 0.060
> #  since this is a one tailed test use  alpha
> #      for our computation
> z <- qt( alpha, df, lower.tail=FALSE)
> z
[1] 1.637033
> xbar_1 <- -88.98
> s_1 <- 7.64
> #
> hypoth_test_unknown( H_0, H_type,
+                      alpha, n_1, xbar_1, s_1  )
              H0_mu                 H1:          std. error
           "-91.13"      "mu >  -91.13"  "1.80076526942174"
                  n           sig level                   t
              "18"              "0.06"   "1.6370326343574"
          samp mean          samp stdev           test stat
           "-88.98"              "7.64"  "1.19393684257938"
            how far        critical low       critical high
 "2.94791151286079"              "n.a." "-88.1820884871392"
           attained            decision
"0.124448701743654"     "do not reject"
> #
> #
> # Case 6
> #
> # first make sure that gnrnd4() is loaded into
> # our environment
> source("../gnrnd4.R")
> #
> # then generate the values
> gnrnd4(2729832604,204904541)
style= 4   size= 27    seed= 72983   num digits= 2   alt_sign= 1
[1] "DONE "
> #
> # let us look at the first and last 6 items in the list
> head( L1 )
[1] 53.85 30.86 53.82 66.00 60.28 66.66
> tail( L1 )
[1] 47.43 51.61 45.17 72.69 55.11 22.52
> n_1 <- length( L1 )
> df <- n_1 - 1
> H_0 <- 55.84
> H_type <- -1    # -1 for <, 0 or !=, 1 for >
> alpha <- 0.070
> #  since this is a one tailed test use  alpha
> #      for our computation
> z <- qt( alpha, df, lower.tail=FALSE)
> z
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```
[1] 1.522319
> xbar_1 <- mean( L1 )
> s_1 <- sd( L1 )
> #
> hypoth_test_unknown( H_0, H_type,
+                      alpha, n_1, xbar_1, s_1  )
              H0_mu                    H1:           std. error
           "55.84"         "mu <  55.84"   "3.33427678164882"
                n             sig level                    t
             "27"                "0.07"   "1.52231897499773"
         samp mean           samp stdev            test stat
  "50.007037037037"    "17.325410376939"  "-1.74939375011289"
          how far         critical low        critical high
 "5.07583281259836"   "50.7641671874016"               "n.a."
          attained              decision
"0.0460099285715019"             "Reject"
> #
> #
> # Case 7
> #
> # then generate the values
> gnrnd4(2519983104,165320226)
style= 4   size= 32    seed= 51998   num digits= 2   alt_sign= 1
[1] "DONE "
> #
> # let us look at the first and last 6 items in the list
> head( L1 )
[1] 180.82 204.80 208.41 216.37 206.42 208.64
> tail( L1 )
[1] 207.72 185.88 218.95 174.35 220.30 197.69
> n_1 <- length( L1 )
> df <- n_1 - 1
> H_0 <- 212.22
> H_type <- -1    # -1 for <, 0 or !=, 1 for >
> alpha <- 0.010
> #  since this is a one tailed test use  alpha
> #      for our computation
> z <- qt( alpha, df, lower.tail=FALSE)
> z
[1] 2.452824
> xbar_1 <- mean( L1 )
> s_1 <- sd( L1 )
> #
> hypoth_test_unknown( H_0, H_type,
+                      alpha, n_1, xbar_1, s_1  )
              H0_mu                    H1:           std. error
           "212.22"         "mu <  212.22"   "2.87244974493417"
                n             sig level                    t
             "32"                "0.01"   "2.45282419340265"
         samp mean           samp stdev            test stat
       "204.6146875"    "16.2490295460842"  "-2.64767469419184"
          how far         critical low        critical high
  "7.04561422870779"    "205.174385771292"               "n.a."
          attained              decision
"0.00631395969623302"             "Reject"
> #
> #
> # Case 8
> # then generate the values
> gnrnd4(2248946804,186400530)
```

```
style= 4   size= 69    seed= 24894   num digits= 2   alt_sign= 1
[1] "DONE "
> #
> # let us look at the first and last 6 items in the list
> head( L1 )
[1] -15.74 -41.31  14.84   8.51 -22.41 -28.35
> tail( L1 )
[1] -11.98  -5.19  18.77  -9.64   4.65  25.82
> n_1 <- length( L1 )
> df <- n_1 - 1
> H_0 <- -0.19
> H_type <- 1    # -1 for <, 0 or !=, 1 for >
> alpha <- 0.010
> #  since this is a one tailed test use  alpha
> #      for our computation
> z <- qt( alpha, df, lower.tail=FALSE)
> z
[1] 2.382446
> xbar_1 <- mean( L1 )
> s_1 <- sd( L1 )
> #
> hypoth_test_unknown( H_0, H_type,
+                      alpha, n_1, xbar_1, s_1  )
             H0_mu                  H1:          std. error
          "-0.19"       "mu >  -0.19"  "2.31519913060291"
                n           sig level                   t
             "69"              "0.01"  "2.38244580316731"
        samp mean          samp stdev           test stat
 "2.50826086956522"  "19.2314883456733"  "1.16545520162775"
         how far        critical low       critical high
 "5.51583645220152"              "n.a."  "5.32583645220152"
        attained            decision
"0.123953334555265"     "do not reject"
> #
```