MATH1309 – Practice Problems 5

By hand

1. Evaluate T^2, for testing H_0: $\mu'=[7, 11]$ using $X = \begin{bmatrix} 2 & 12 \\ 8 & 9 \\ 6 & 9 \\ 8 & 10 \end{bmatrix}$

2. What distribution does T^2 follow for this problem?

3. If we were using $\alpha=0.05$, what conclusion do you reach?

Using Software

Hypothesis Test

We can use the code we have covered so far to conduct a hypothesis test for the mean vector.

Research Problem

Scores obtained by n=87 college students on the College Level Examination Program (CLEP) subtest X1 and College Qualification Test (CQT) subtest X2 and X3 are contained in the datafile Week_05.csv on Canvas and SAS Studio. The students underwent additional workshop training in preparation for the tests. We want to know if they have scored differently to the historical average for these tests, $\mu' = [500 \quad 50 \quad 30]$ (which represents the average scores for thousands of students over the last 20 years).

1) Read in the Data file Week_05.csv as on SAS Studio and Canvas

2) Calculate T^2

3) Find your critical value

4) Determine the lengths and directions for the axes of the 95% ellipsoid for μ

5) Compute the simultaneous CI

6) Create a chi-square probability plot to assess all three variables, for multivariate normality. Is the data set multivariate normal?