Math 741 Assignment 13 (Hand-In)

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7.4.6.(H) solution:

$$P[9.06 - k(S) \leq \bar{Y} \leq 90.6 + k(S)] = 0.99$$

$$P[-k(S) \leq \bar{Y} - 90.6 \leq k(S)] = 0.99$$

$$P[\bar{Y} - 90.6 \leq -k(S)] = 0.005$$

$$P[\frac{\bar{Y} - 90.6}{S/\sqrt{20}} \leq \frac{-k(S)}{S/\sqrt{20}}] = 0.005$$

$$\implies \frac{-k(S)}{S/\sqrt{20}} = -2.861 \implies k(S) = \frac{2.861S}{\sqrt{20}} = 0.6397S$$

7.4.12.(H) solution: Let E denote margin of error, then

$$2E = 49.9 - 44.7 \implies E = 2.6$$

Therefore, $\bar{y} = 44.7 + 2.6 = 47.3$ and

$$E = |t_{0.025,15}| \cdot \frac{s}{\sqrt{16}} = 2.6 \implies s = \frac{10.4}{|t_{0.025,15}|} = 4.8793$$

7.4.20.(H) solution: Given the test,

$$H_0 : \mu = 0.618$$

$$H_1 : \mu \neq 0.618$$

with $n = 34, \alpha = 0.01$. Enter the data in the list of calculator and obtain P-value $= 0.43191 > \alpha = 0.01$. Then fail to reject H_0. There is enough evidence to conclude the national flags follows the golden ratio.