Height Study

Group Assignment

Hypothesis Test

In a study of women's heights, we obtain the following measurements:

$$[1.66,\ 1.69,\ 1.50,\ 1.80,\ 1.68,\ 1.64,\ 1.65,\ 1.70,\ 1.72,\ 1.67,\ 1.69,\ 1.68,\ 1.20,\ 1.90,\ 1.2]$$

In the population, the heights of woman is assumed to be Gaussian (normal) distributed with a mean of 1.68m and a standard deviation of 0.2m. Assume that you only test on the mean.

1. Estimate the mean of the population sample.
2. Formulate the NULL hypothesis to test wether the sample has the sample mean as the same mean as the rest of the population.
3. Formulate the alternative hypothesis to the NULL hypothesis.
4. Calculate the test statistics z.
5. Find the p-value based on a Gaussian pdf.
6. With a significance level of $\alpha = 0.05$, can we reject the NULL hypothesis?
7. If we changes the significance level to $\alpha = 0.1$, what would that imply?
8. Now repeat the experiment 100 times: Make a matlab program, where 30 samples are drawn from a Gaussian distribution with a mean of 1.68m and a standard deviation of 0.2m.
    - With a significance level of $\alpha = 0.05$, how often do we falsely reject the NULL hypothesis?
    - Now draw samples from a distribution with a mean of 1.78m and a standard deviation of 0.2m. How often do we falsely fail to reject the NULL hypothesis?