Topic 25: First review

Topic 21

Look at $\mu_1 - \mu_2$ when σ_1 and σ_2 are known

Pop 1: μ_1, σ_1, p_1

Pop 2: μ_2, σ_2, p_2

Confidence Interval for $\mu_1 - \mu_2$

use the Normal Distribution

Hypothesis test

$H_0: \mu_1 - \mu_2 = 0$

$H_1: \begin{cases} \mu_1 - \mu_2 < 0 \\ \mu_1 - \mu_2 \neq 0 \\ \mu_1 - \mu_2 > 0 \end{cases}$

Equivalent forms

$\mu_1 = \mu_2$

$\mu_1 < \mu_2$

$\mu_1 \neq \mu_2$

$\mu_1 > \mu_2$

Topic 22

Look at $\mu_1 - \mu_2$ when σ_1 and σ_2 are unknown

Confidence Interval for $\mu_1 - \mu_2$

use the Student's-t Distribution with either the simple or the computed degrees of freedom

Hypothesis test

$H_0: \mu_1 - \mu_2 = 0$

$H_1: \begin{cases} \mu_1 - \mu_2 < 0 \\ \mu_1 - \mu_2 \neq 0 \\ \mu_1 - \mu_2 > 0 \end{cases}$

Equivalent forms

$\mu_1 = \mu_2$

$\mu_1 < \mu_2$

$\mu_1 \neq \mu_2$

$\mu_1 > \mu_2$

Topic 24

Look at $p_1 - p_2$

Confidence Interval for $p_1 - p_2$

use the Normal Distribution to approximate the distributions of proportions

Hypothesis test

$H_0: p_1 - p_2 = 0$

$H_1: \begin{cases} p_1 - p_2 < 0 \\ p_1 - p_2 \neq 0 \\ p_1 - p_2 > 0 \end{cases}$

Equivalent forms

$p_1 = p_2$

$p_1 < p_2$

$p_1 \neq p_2$

$p_1 > p_2$

Topic 25

Look at $\dfrac{\sigma_1^2}{\sigma_2^2}$

Confidence Interval for $\dfrac{\sigma_1^2}{\sigma_2^2}$

To do this we will need a new distribution, the F distribution. It has a degree of freedom for the sample related to population one and a degree of freedom for the sample related to population two.

Hypothesis test

$$H_0: \frac{\sigma_1^2}{\sigma_2^2} = 1$$

$$H_1: \begin{cases} \dfrac{\sigma_1^2}{\sigma_2^2} < 1 \\ \dfrac{\sigma_1^2}{\sigma_2^2} \neq 1 \\ \dfrac{\sigma_1^2}{\sigma_2^2} > 1 \end{cases}$$

Equivalent forms

$\sigma_1^2 = \sigma_2^2$

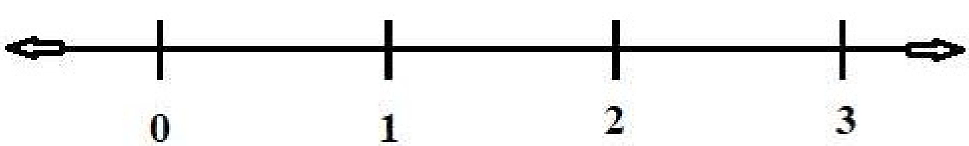
$\sigma_1^2 < \sigma_2^2$

$\sigma_1^2 \neq \sigma_2^2$

$\sigma_1^2 > \sigma_2^2$

The F distribution is not symmetric. It has values only in the positive x-axis. Reading the published tables for the critical values of the F distribution is often a real challenge.

You might want to consider that there are just as many numbers between 0 and 1 as there are between 1 and infinity.



If x is a number between 0 and 1 then 1/x is a number between 1 and infinity. If y is a number between 1 and infinity then 1/y is a number between 0 and 1.