

# Heights of 16 Students

REMARK : SMALL SAMPLE.

## Hypotheses

Students are taller than general population, on average?

Do we have enough evidence based on this sample to make statements like that?

Two tailed test.

- $H_0$ : no difference from general population
- $H_1$ : Difference " "

Equivalently

- $H_0$ :  $\mu_{\text{student}} = 169 \text{ cm}$
- $H_1$ :  $\mu_{\text{student}} \neq 169 \text{ cm}$ .

## TEST STATISTIC.

Sample mean = 173 cm

Sample variance = 144 cm<sup>2</sup>

Sample STD. Deviation = 12 cm.

4)

Expected value under  $H_0$ . = 169.

$$TS = \frac{173 - 169}{12/\sqrt{16}} = 1.33$$

Critical value

$$\alpha = 0.05$$

Two tailed test  $\therefore k=2$ .

degrees of freedom =  $n-1 = 15$ .

From Murdoch Barnes table 7.

$$C.V = 2.131.$$

Decision

$$\text{is } |TS| > CV?$$

$$\text{is } |1.33| > CV? \quad (CV = 2.131)$$

NO. Fail to reject  $H_0$ .

Not enough evidence to say students are different in terms of height to the general population.

3/  
one tailed test

$H_0$  : Students are not taller than general population

$H_1$  : Students are taller than general population

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Equivalently

$H_0$  :  $\mu_{\text{student}} \leq 169$

$H_1$  :  $\mu_{\text{students}} > 169$

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- T.S is SAME AS TWO TAILED test, i.e. 1.33
  - C.V is 1.753 ( $\alpha/2$ ,  $df = 15$ ).

IS  $|TS| > CV$ ?

NO.

Not enough evidence to support hypothesis that students are taller.