Testing of Hypothesis

Example – 3

(consider this example (ignore the one given in slides)

Example 3 - modified problem

innovate achieve lead

A random sample of 40 items produced by a company A have a mean life time of 647 hours with S.D 27 hours. While a sample of 40 items by company B has a mean life time of 638 hours with S.D of 31 hours.

Does this substantiate the claim of the company A that their items are ~~superior to those~~ same as those produced by company B. in terms of mean life

Example 3 – Solution:

A random sample of 40 items produced by a company A have a mean life time of 647 hours with S.D 27 hours. While a sample of 40 items by company B has a mean life time of 638 hours with S.D of 31 hours.

Does this substantiate the claim of the company A that their items are ~~superior to those~~ same as those produced by company B in terms of mean life

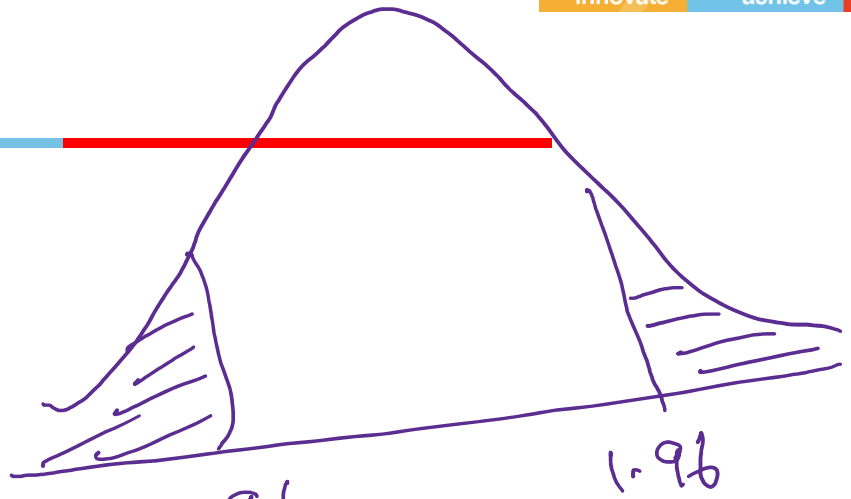
i.e $\mu_1 = \mu_2$

Solution:-

$H_0: \mu_1 - \mu_2 = 0$

$H_1: \mu_1 - \mu_2 \neq 0$

$\alpha = 0.05$



$$Z = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}} = \frac{(647 - 638) - 0}{\sqrt{\frac{(27)^2}{40} + \frac{(31)^2}{40}}}$$

$$= 3.73$$

Reject H_0

Example 3

Earlier problem or it is

innovate achieve lead

A random sample of 40 items produced by a company A have a mean life time of 647 hours with S.D 27 hours. While a sample of 40 items by company B has a mean life time of 638 hours with S.D of 31 hours.

Does this substantiate the claim of the company A that their items are superior to those produced by company B.

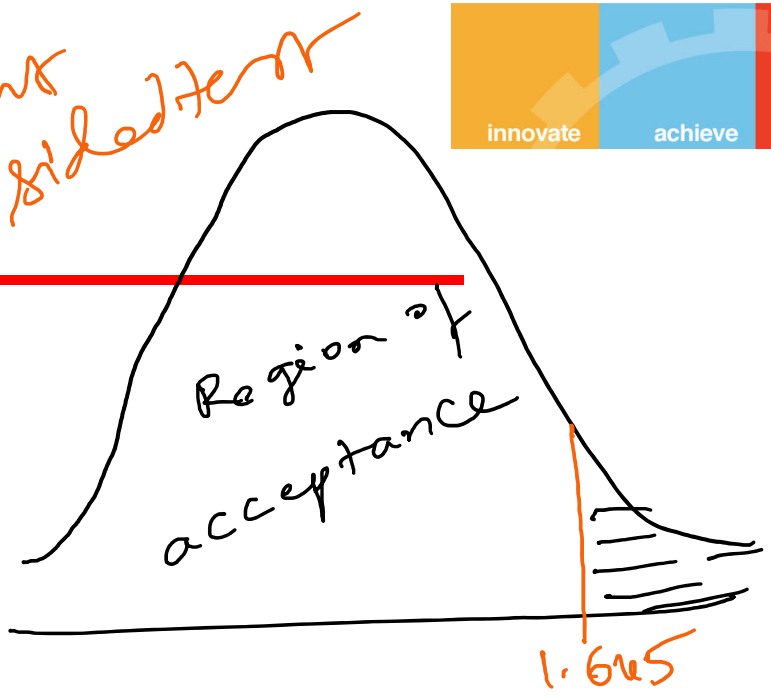
i.e $\mu_1 > \mu_2$

Solution:-

$H_0: \mu_1 - \mu_2 = 0$

$H_1: \mu_1 - \mu_2 > 0$ → Right sided test

$\alpha = 0.05$



$$Z = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}} = \frac{(647 - 638) - 0}{\sqrt{\frac{(27)^2}{40} + \frac{(31)^2}{40}}}$$

$= 3.73$

Reject H_0

i.e. Accept alternate Hypothesis.

Thanks