Two Independent Populations

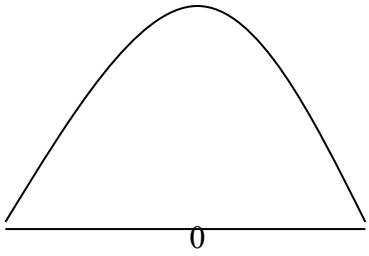
Problem 1) According to data published, in 2003 the average starting salary for accountant majors was $39,560 and the starting salary for marketing majors was $41,050. Suppose these mean starting salaries are based on a random samples of 64 accountant majors, and 81 marketing majors, and further assume that the st. deviation for the starting salaries of these majors were $3560 and $3880, respectively in 2003. **Test** at 1% significance level whether the 2003 mean starting salary for all accountant majors is less than that for all marketing majors.

Accountant major (μ_1) $n_1 =$ $\bar{x}_1 =$ $s_1 =$

Marketing majors (μ_2) $n_2 =$ $\bar{x}_2 =$ $s_2 =$

SC: $\mu_1 < \mu_2$ H_0: H_0 :

OC: H_1 : H_1:



CV $= Z =$

Test Statistic = ***ts*** $= z = \dfrac{(\bar{x}_1 - \bar{x}_2) - 0}{\sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}} =$

Conclusion: Accept or reject $\mathbf{H_0}$?

Comment: Accept or reject **SC**?

Problem 2) The management at the New Century Bank claims that the mean waiting time for all customers as its branch is not different than the Public Bank, which is its main competitor. A business consulting firm took a sample of 200 customers from the New Century Bank and found out that they waited an average of 4.5 minutes with a standard deviation of 1.2 minutes before being served. Another sample of 300 customers taken from the Public Bank showed that these customers waited an average of 4.75 minutes with a standard deviation of 1.5 minutes before being served.

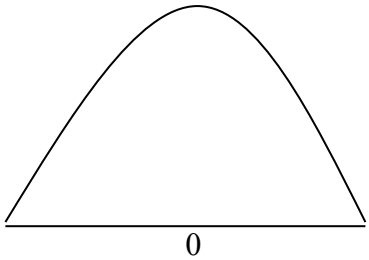
Test at 2. % significance level whether the claim of the management of the New Century Bank is true.

New Century Bank (μ_1) $n_1 =$ $\bar{x}_1 =$ $s_1 =$

Public Bank (μ_2) $n_2 =$ $\bar{x}_2 =$ $s_2 =$

SC: H_0: H_0 :

OC: H_1 : H_1:



CV $= Z =$

Test Statistic = ***ts*** $= z = \dfrac{(\bar{x}_1 - \bar{x}_2) - 0}{\sqrt{\dfrac{s_1^2}{n_1} + \dfrac{s_2^2}{n_2}}} =$

Conclusion: Accept or reject $\mathbf{H_0}$?

Comment: Accept or reject **SC**?

Two Independent Populations

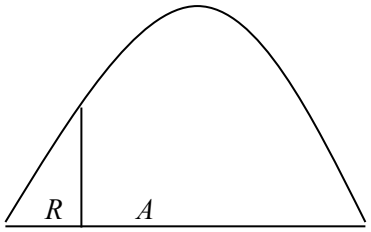
Problem 1)

Accountant major (μ_1) $n_1 = 64$ $\bar{x}_1 = 39560$ $s_1 = 3560$

Marketing majors (μ_2) $n_2 = 81$ $\bar{x}_2 = 41050$ $s_2 = 3880$

SC: $\mu_1 < \mu_2$ $H_0: \mu_1 \geq \mu_2$ $H_0: \mu_1 - \mu_2 \geq 0$

OC: $\mu_1 \geq \mu_2$ $H_1: \mu_1 < \mu_2$ $H_1: \mu_1 - \mu_2 < 0$



Critical value (From Table) **Z** = -2.326

$$\textbf{TS} = z = \frac{(\bar{x}_1 - \bar{x}_2) - 0}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} = \frac{(39560 - 41050) - 0}{\sqrt{\frac{3560^2}{64} + \frac{3880^2}{81}}} = -2.4$$

$\Rightarrow$ ***It falls inside CR*** **Conclusion: R**eject H_0 **Comment:** Accept that $\mu_1 < \mu_2$

Problem 2)

New Century Bank (μ_1) $n_1 = 200$ $\bar{x}_1 = 4.5$ $s_1 = 1.2$

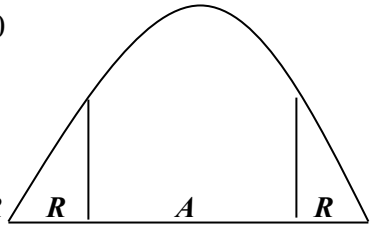
Public Bank (μ_2) $n_2 = 300$ $\bar{x}_2 = 4.75$ $s_2 = 1.5$

SC: $\mu_1 = \mu_2$ $H_0: \mu_1 = \mu_2$ $H_0: \mu_1 - \mu_2 = 0$

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

Critical value (From Table) **Z** = ± 2.326

$$\textbf{TS} = z = \frac{(\bar{x}_1 - \bar{x}_2) - 0}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} = \frac{(4.5 - 4.75) - 0}{\sqrt{\frac{1.2^2}{200} + \frac{1.5^2}{300}}} = \frac{-0.25}{.1212} = -2.06$$ $\Rightarrow$ ***Falls not inside CR***



-2.326 0 2.326

Conclusion: *Accept Ho*
Comment: *The claim of the management of the New Century Bank is true.*