The management of savings center has calculated mean of $n = 42$ saving accounts $\bar{x} = Rs. 75000$ and standard deviation $s = Rs. 10000$. you have to conclude that would it be reasonable that the population mean is less than Rs.100000 by using 5% significance level.

Solution

$H_0: \mu \geq 100000$

$H_a: \mu < 100000$

We don't know the population standard deviation and sample size is bigger than 30, so we must use t-distribution.

Test statistic is

$$t = \frac{\bar{x} - 100000}{\frac{s}{\sqrt{n}}} = \frac{75000 - 100000}{\frac{10000}{\sqrt{42}}} = -16.202.$$

Critical value for 5% significance level and $42 - 1 = 41$ degrees of freedom is

$$t_{crit} = -1.683.$$

We reject null hypothesis at 5% significance level because test statistic is less than critical value. There is a sufficient significance to conclude that it would be reasonable that the population mean is less than Rs.100000.