Solution to example given in the document

Given data:

n = 10

x-bar = 27

variance = 20

H0: u0 = 30

Ha: ua != 30

alpha = 0.05

Solution:

As standar deviation is given, I'll perform z-test to test the hypothesis

SE = sqrt(variance)/sqrt(n) = sqrt(20)/sqrt(10) = 1.414

zstat = (x-bar - u0)/SE = (-3)/1.414 = -2.122

Therefore, p-value = 0.033838

as, p-value is between 0.01 and 0.05, we have significant evidence against H0.

As, p-value: 0.033838 is lesseer than alpha: 0.05, we will reject the null hypothesis.

To check whether u < 30

H0: u0 = 30

Ha: ua < 30

alpha = 0.05

Solution:

SE = sqrt(variance)/sqrt(n) = sqrt(20)/sqrt(10) = 1.414

zstat = (x-bar - u0)/SE = (-3)/1.414 = -2.122

As this is a left tailed test,

We need to check whether Zstat < -Zalpha

If true, we reject H0 else we retain it.

Here, Zalpha = -1.645

As, Zstat: -2.122 < -Zalpha: -1.645

Therefore, we reject null hypothesis and hold u < 30 as True.