STAT212 Assignment 7

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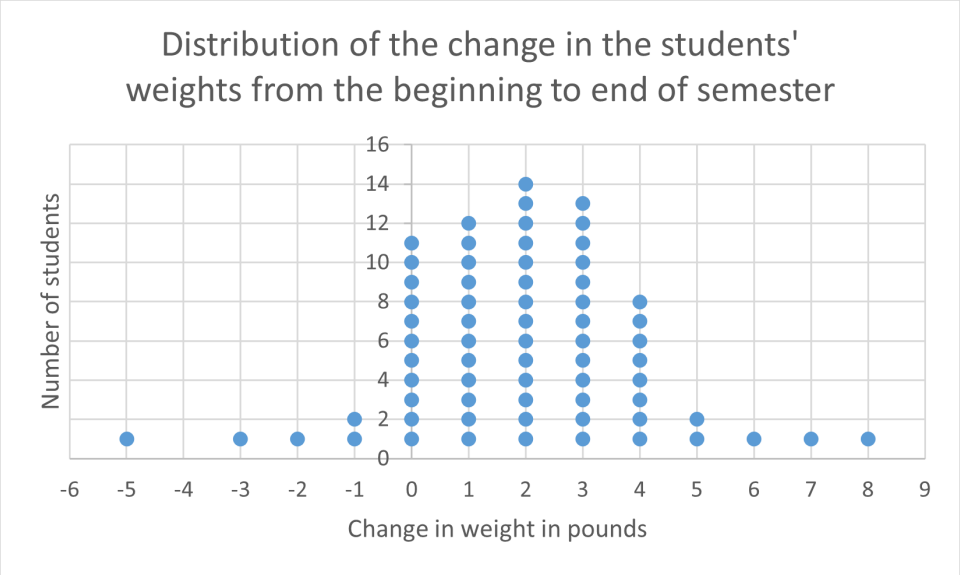
April 12, 2021

Answer to Question 1



Answer to Question 2

$$\text{mean change in weight} = \frac{\text{sum of change in weights}}{\text{total students}} = \frac{130}{68} = 1.91$$

Answer to Question 3

The parameter being tested is the common mean change in weight, δ.

A value of 0 denotes weight no change, thus $\delta = 0$ is the null value.

Professor Levitsky wants to prove freshman students tend to gain weight during their first semester in college, consequently, the alternative should be $\delta > 0$ (a positive value is an increase). Consequently, the null should be $\delta \leq 0$ ($\delta = 0$ is also acceptable).

$$H_0 : \delta \leq 0$$

$$H_a : \delta > 0$$

Answer to Question 4

We compute the value of the test statistic:

$$t = \frac{\bar{d}}{s_d/\sqrt{n}}$$

We know:

$$n = 68$$

$$\bar{d} = 1.91$$

$$s_d = 2.13$$

Plugging these values

$$t_0 = 7.41$$

The critical value is

$$t_\alpha(\text{Right tailed})$$

with $df = n - 1$. We know:

$$n = 68$$

$$\alpha = 0.05$$

Using excel we find:

$$t_\alpha = 1.67$$

Since $t_0 > t_\alpha$, we reject the null hypothesis.

Answer to Question 5

The result of the hypothesis test supports Professor Levitsy's theory: freshman students tend to gain weight during their first semester in college.