Assignment 4.7

Blood glucose levels for obese patients have a mean of 100 with a standard deviation of 15. A researcher thinks that a diet high in raw cornstarch will have a positive effect on blood glucose levels. A sample of 36 patients who have tried the raw cornstarch diet have a mean glucose level of 108. Test the hypothesis that the raw cornstach had an effect or not.

Sol

Assuming the null hypothesis

H_0 = cornstarch has no effect ie, mean should be same

H_1 = cornstarch has effect ie, mean changes

Assuming the α as 0.05

Given mean = 100

standard deviation $\sigma = 15$

Z value $\boxed{Z = \frac{x-\mu}{\sigma}}$

x is new mean

μ is old mean

σ is standard deviation

$$\sigma_2 = \frac{\text{old SD}}{\sqrt{\text{Total No}}} = \frac{15}{\sqrt{36}} = \frac{15}{6} = 2.5$$

Now calculating Z value $\frac{108-100}{2.5} = \frac{8}{2.5} = 3.2$

Now check the Z value of 3.2 ie 0.9993

$1 - Z = 1 - 0.9993$

$= 0.0007$; ie less than 0.05

As $\alpha(0.05) > 0.0007$ we reject null hypothesis

∴ we declare cornstarch has effect on obese patients.