

### Assignment 18.1 : Problem Statement

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 cornstarch had an effect or not.

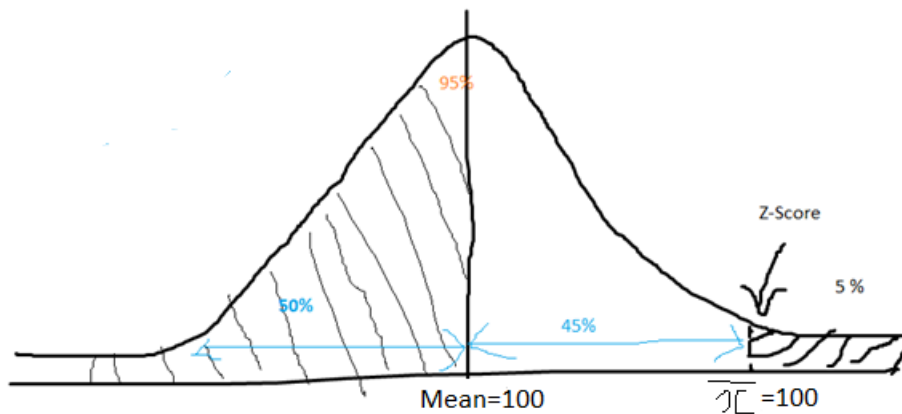
#### Solution :

1: State the Null hypothesis : The accepted fact is that the population mean is 100,  
 $H_0: \mu=100$ .

2: Alternate Hypothesis.  
diet high in corn starch will have a positive effect  
 $H_1: \mu > 100$ .

The fact that we are looking for scores "greater than" a certain point means that this is a one-tailed test.

3: visualize



4: alpha level not given , using 5% (0.05).

5: the rejection region area  
(given by the alpha level above) from the z-table.  
An area of .05 is equal to a z-score of 1.645 (avg of 1.64 and 1.65 from below z table)

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633

6: the test statistic using this formula:

$$Z = \frac{\bar{x} - \mu_0}{\sigma / \sqrt{n}}$$

For this set of data:  $z = (108 - 100) / (15 / \sqrt{36}) = 3.20$

If 6 is greater than 5, reject the null hypothesis & if it's less than 5, you cannot reject the null hypothesis.  
In this case, it is greater ( $3.20 > 1.645$ ), so we can reject the null.

**i.e. there is raw cornstarch effect.**