

## TASK 1

### Assignment 1.1

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

Mean = 100

STD = 15

Sample Survey, on patient

Sample = 36

Level = 108

Z calculation for 8, 2.5

Calculated Z\_value = 3.2

We will consider the confidence level  $C = 95\%$  as in the question, it is not explicitly mentioned.

So, we will search this value of  $C = 95\% = 0.95$  in the Z-Table

Accordingly, the Z-score (from the Z-Table) =  $Z_{\text{Critical}} = 1.64$

As, the Calculated Z\_value  $> Z_{\text{Critical}}$

**So we reject the null hypothesis**

### Assignment 1.2

In one state, 52% of the voters are Republicans, and 48% are Democrats. In a second state, 47% of the voters are Republicans, and 53% are Democrats. Suppose a simple random sample of 100 voters are surveyed from each state.

What is the probability that the survey will show a greater percentage of Republican voters in the second state than in the first state?

#### Solution

## STATISTICS 3&4-

1. State\_1\_Republicans 52
2. State\_1\_Democrats 48
3. State\_2\_Republicans 47
4. State\_3\_Democrats 43

The mean of difference in sample proportions 0.05

Standard deviation of the differences

1\_Value 0.00249600

2\_Value 0.00249100

Standard Deviation both = 0.07061869

Probability of P1 is less than P2 by -0.708

Using Normal Distribution calculator

$P(z \leq 0.7082) = 0.24$

The probability of a z-score being -0.7082 or less is 0.24

### **Assignment 1.3**

You take the SAT and score 1100. The mean score for the SAT is 1026 and the standard deviation is 209. How well did you score on the test compared to the average test taker?

### **Solution**

SCORE	1100.00
SAT	1026.00
STD	209.00
Z-Score	0.35

Now,  
check the z-value from z table for the percentage of test – seeker scored.  
A z-score of .354 is  $.1368 + .5000* = .6368$  or 63.68%.