**Assignment 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 n not.

H0 :Null Hypothesis = x\_bar = 100

HA: Alternate Hypothesis <> 100

Two tailed test

I am considering 0.05 significance level to reject the null

hypothesis

Left Tail : z\_critic = -1.95

Right Tail : z\_critic =1.95

n = 36

x\_bar = 100

x1\_bar = 108

std. dev. = 15

If z is less than -1.95 or greater then 1.95 then reject the null hypothesis.

z = (x1\_bar – x\_bar)/(std.dev./sqrt(n))

= (108-100)/(15/sqrt(36))

= 8/(15/6)

= 8/(5/2)

= 8/2.5

= 3.2

Since value of z is greater the z\_critic = 1.95, hence we are rejecting the claim that raw cornstarch do not have any effect on the blood glucose level.

Assignment 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?

State1 – P1(Voters are Republicans) = 0.52

State2 – P2(Voters are Republicans) = 0.47

Number of voters from each state n = 100

n1P1 = 100 \* 0.52 = 52

n1(1-P1) = 100\*0.48 = 48

n2P2 = 100 \* 0.47 = 47

n2(1-P2) = 100 \* 0.53 = 53

Mean : Difference of sample proportions =

μ(p1 – p2) = P1-P2 = 0.52 – 0.47 = 0.05

Standard deviation of the difference:

σd = sqrt{ [ P1(1 - P1) / n1 ] + [ P2(1 - P2) / n2 ] }

σd = sqrt{ [ (0.52)(0.48) / 100 ] + [ (0.47)(0.53) / 100 ] }

σd = sqrt (0.002496 + 0.002491) = sqrt(0.004987) = 0.0706

Here we are required to find that probability p1 is less than p2 which is like p1 - p2 is less than zero. To find this probability, we need to transform the random variable (p1 - p2) into a z-score.

z(p1-p2) = x - μ(p1 – p2)/ σd – (0 – 0.05)/0.0706 = -0.7082

P(z <=0.7082) = 0.24

The probability that the survey will show a greater percentage of Republican voters in the second state than in the first state is 0.24.

**Assignment 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?

Z = x – Mean

Std. Dev.

= (1100 – 1026)/209

= 74/ 209

= 0.3540

Your score is 0.3540 standard deviation above the mean