**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.**

**Ans:**We need to test hypothesis for blood glucose level for obese patients

We have first frame our null hypothesis and alternate hypothesis

State the null hypothesis: H0:mean=100

State the alternate hypothesis: Ha:≠100

We assume alpha as 0.05. As this is a two-tailed test, split the alpha into two.

0.05/2=0.025

Find the z-score associated with your alpha level. You’re looking for the area in one tail only. A z-score for 0.75(1-0.025=0.975) is 1.96.

As this is a two-tailed test, you would also be considering the left tail (z=1.96)

Find the test statistic using this formula: z score formula

z=(140-100)/(15/√30)=14.60.

If Step 5 is less than -1.96 or greater than 1.96 (Step 3), reject the null hypothesis.

In this case, it is greater, so you can reject the null hypothesis

**Problem Statement 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?**

We need sample to be big enough to test hypothesis on population.

Because n1P1 = 100 \* 0.52 = 52, n1(1 - P1) = 100 \* 0.48 = 48, n2P2 = 100 \* 0.47 = 47, and n2(1 - P2) = 100 \* 0.53 = 53 are each greater than 10, the sample size is large enough.

Find the mean of the difference in sample proportions: E(p1 - p2) = P1 - P2 = 0.52 - 0.47 = 0.05.

Find the 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

This problem requires us to find the probability that p1 is less than p2. This is equivalent to finding the probability that p1 - p2 is less than zero. To find this probability, we need to transform the random variable (p1 - p2) into a z-score. That transformation appears below.

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

Using Stat Trek's Normal Distribution Calculator, we find that the probability of a z-score being -0.7082 or less is 0.24.

**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?**

Your score is 1100 and the mean score is 1026

Standard Deviation is 209

Z=(1100-1026)/209

Z = 0.354

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%.