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.

We set our NULL Hypothesis to be the glucose variable = 100 since that's the known fact. The alternative is that the glucose variable is greater than 100.

**Significance Level**

Unless specified, we typically set the significance level to 5%, or 0.05. Now, if we figure out the corresponding z-value from the z-table, we'll see that it corresponds to 1.645. This is now the z-score cut off for significance level, meaning the area to the right (or z-scores higher than 1.645) is the rejection hypothesis space.

**Computation**

Now, we can compute the random chance probability using z scores and the z-table. Recall the formula from earlier, z = (x - μ)/ σ. Now, before we go into computing, let's overview the difference between standard deviation of the mean and standard deviation of the distribution.

When we want to gain a sense the precision of the mean, we calculate what is called the sample distribution of the mean. Assuming statistical independence, the standard deviation of the mean is related to the standard deviation of the distribution with the formula σmean = &sigma / √N.

With that knowledge in mind, we've been given the standard deviation of the distribution, but we need the standard deviation of the mean instead. So before we begin calculating the z value, we plug in the values for the formula above. Then we get σmean = 15 / √36, or 2.5.

Now we have all the needed information to compute the z value:

z = (108-100) / 2.5 = 3.2

**Hypotheses**

Now we can get the p-value from the z-value above. We see that it corresponds to .9993, but we have to remember to subtract this number from 1, making our p-value 0.0007. Recall that a p-value below 0.05 is grounds for rejecting the null hypothesis. There, we do just that and conclude that there is an effect from the raw starch.