4.16 Various tests

4.16.1 Do a test for population mean

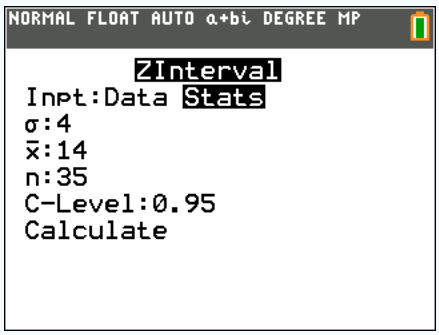
There are two cases when it comes to computing the confidence interval for a normal population: one if σ is known, and the other when σ is unknown.

Finding the confidence interval when σ is known

Suppose you have to find a 95% confidence interval for a population mean, given the following information:

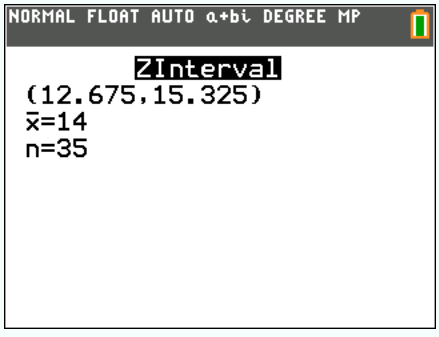
- sample mean $\bar{x} = 14$;
- sample size $n = 35$;
- population standard deviation $\sigma = 4$.

Press list stat , TESTS, ZInterval and fill the parameters as follows:



C-Level is the 95% given in the question

Press Calculate. The following should display:



the first line gives the confidence interval

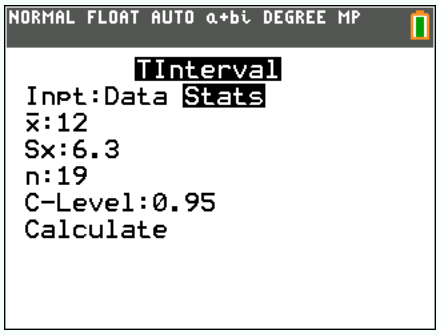
Tip: If you are given a data set and not the sample mean and sample size, you can fill a list first, select `data` in the `ZInterval` screen and add the list, putting `Freq: 1`.

Finding the confidence interval when σ is unknown

Suppose you have to find a 95% confidence interval for a population mean, given the following information:

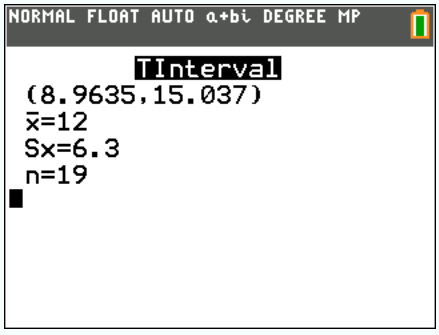
- sample mean $\bar{x} = 12$;
- sample size $n = 19$;
- sample standard deviation $s = 6.3$.

Press list stat , `TESTS`, `TInterval` and fill the parameters as follows:



`C-Level` is the 95% given in the question

Press `Calculate`. The following should display:



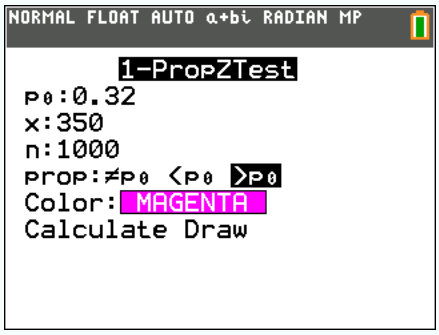
the first line gives the confidence interval

Tip: If you are given a data set and not the sample mean, sample size and sample standard deviation, you can fill a list first, select `data` in the `TInterval` screen and add the list, putting `Freq: 1`.

4.16.2 Do a test for proportion of a population

Suppose we want to test that more than 32% of Switzerland ate *fondue* this month. We collect a random sample of 1′000 Swiss, and find out that 350 of them did eat a *fondue*. What can we conclude at a significance level of $\alpha = 0.05$?

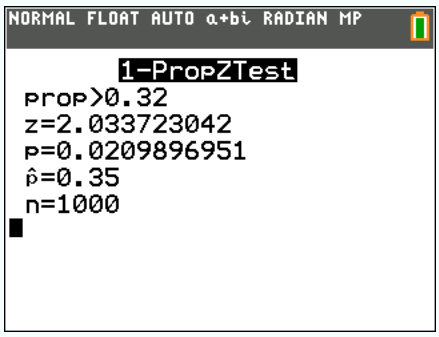
Press list stat , TESTS, 1-PropZTest and fill the parameters as follows:



p_0 is the 32%, and $>p_0$ is

because H_1:"more than 32%"

Press Calculate. The following should display:



the first line gives the confidence interval

The $p-$value being $0.021 < 0.05$, we reject the null hypothesis, and conclude that more than 32% of the population ate *fondue* this month.

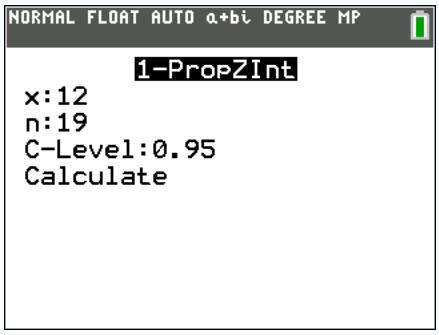
4.16.3 Find the confidence interval for a population proportion

Suppose you have to find a 95% confidence interval for a population proportion, given the following information:

- number of "successes" $x = 12$;

- number of trials $n = 19$.

Press list stat , `TESTS`, `1-PropZInt` and fill the parameters as follows:



`C-Level` is the 95% given in the question

Press `Calculate`. The following should display: