

## 4.16 Various tests


### 4.16.1 Do a test for population mean

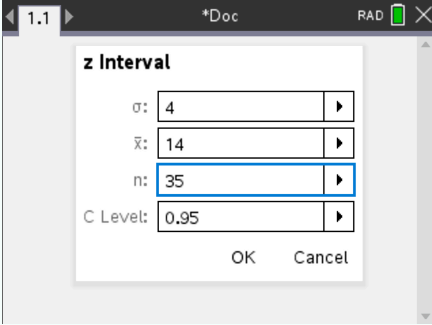
There are two cases when it comes to computing the confidence interval for a normal population: one if  $\sigma$  is known, and the other when  $\sigma$  is unknown.

#### Finding the confidence interval when $\sigma$ is known

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

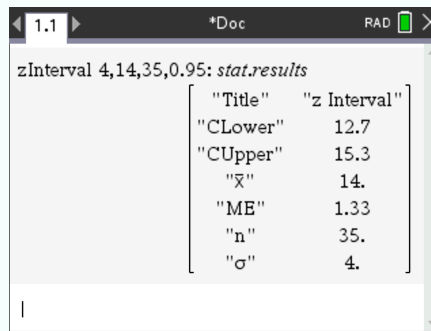
- sample mean  $\bar{x} = 14$ ;
- sample size  $n = 35$ ;
- population standard deviation  $\sigma = 4$ .

Press , select Statistics > Confidence Intervals > z Interval. Choose Stats as data input method. Then, fill as follows:



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

Press . The following should display:



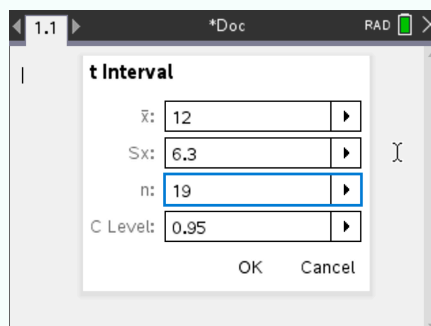
*Tip:* If you are given a data set and not the sample mean and sample size, you can fill a list first, select data as data input method in the **ZInterval** screen and add the list, putting **Freq:1**.

### Finding the confidence interval when $\sigma$ 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  $s = 6.3$ .

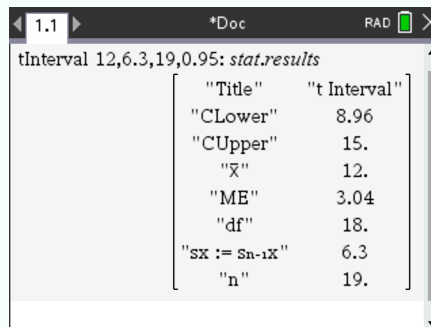
Press , select Statistics > Confidence Intervals > t Interval. Choose Stats as data input method. Then, fill as follows:



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

Press 


The following should display:

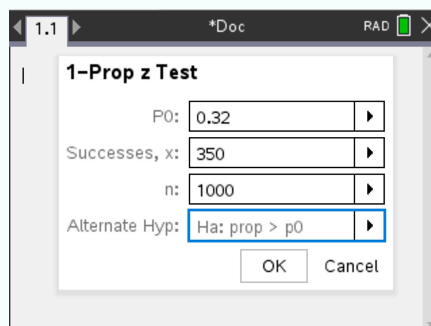


*Tip:* If you are given a data set and not the sample mean, sample size and sample standard deviation, you can fill a list first, select **data** in the **TInterval** screen and add the list, putting **Freq:1**.

#### 4.16.2 Do a test for proportion of a population

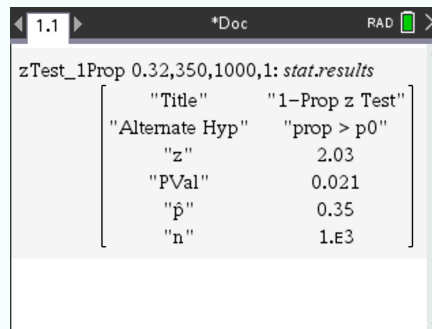
Suppose we want to test that more than 32% of Switzerland ate *fondue* this month. We collect a random sample of 1'000 Swiss, and find out that 350 of them did eat a *fondue*. What can we conclude at a significance level of  $\alpha = 0.05$ ?

Press , select Statistics > Stat Tests > 1-Prop z Test and fill the parameters as follows:



$p_0$  is the 32%, and  $> p_0$  is because  $H_1$ : "more than 32%"

Press . The following should display:



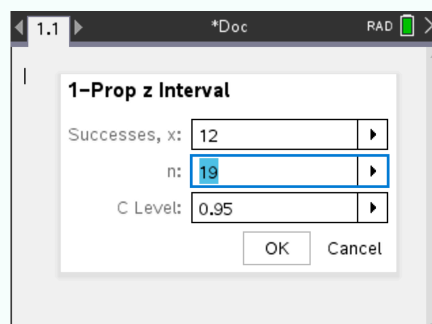
The  $p$ -value being  $0.021 < 0.05$ , we reject the null hypothesis, and conclude that more than 32% of the population ate *fondue* this month.

#### 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:

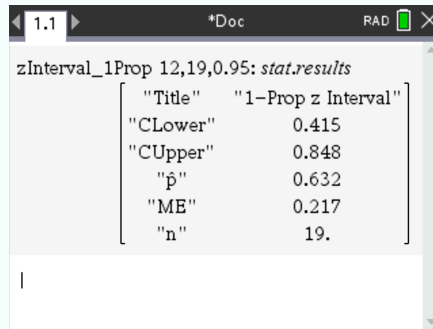
- number of “successes”  $x = 12$ ;
- number of trials  $n = 19$ .

Press  , select Statistics > Confidence Intervals > 1-Prop z Interval and fill the parameters as follows:



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

Press  . The following should display:



The screenshot shows a TI-NSPIRE CX calculator window titled "1.1" with a document icon and "RAD" mode. The display shows the command `zInterval_1Prop 12,19,0.95: stat.results` and its output as a list of key-value pairs:

Key	Value
"Title"	"1-Prop z Interval"
"CLower"	0.415
"CUpper"	0.848
"p̂"	0.632
"ME"	0.217
"n"	19.