Task 1: Descriptive statistics of measurements of dolphin skulls

In this task we obtain descriptive statistics of the six continuous measurements of Hector dolphin skulls: X1 ~ X6. Note that of the 59 skulls, 13 were from the North Island population (Island = 1) and 46 from the South Island populations (Island = 2).

The statistics of our interest in this task are:

- Mean
- Standard deviation
- Standard error

(The dataset we use in this task contains no missing value. This is because the missing measurements mentioned in the DVD were replaced with their estimated values, using a missing data estimation procedure. You will learn such procedures and many other advanced and very useful statistical procedures in Statistics papers at university.)

(1) Insert a new worksheet, and name it as "Descriptive statistics".

(2) Copy and paste all data from the "Dolphins data" worksheet to the "Descriptive statistics" worksheet.

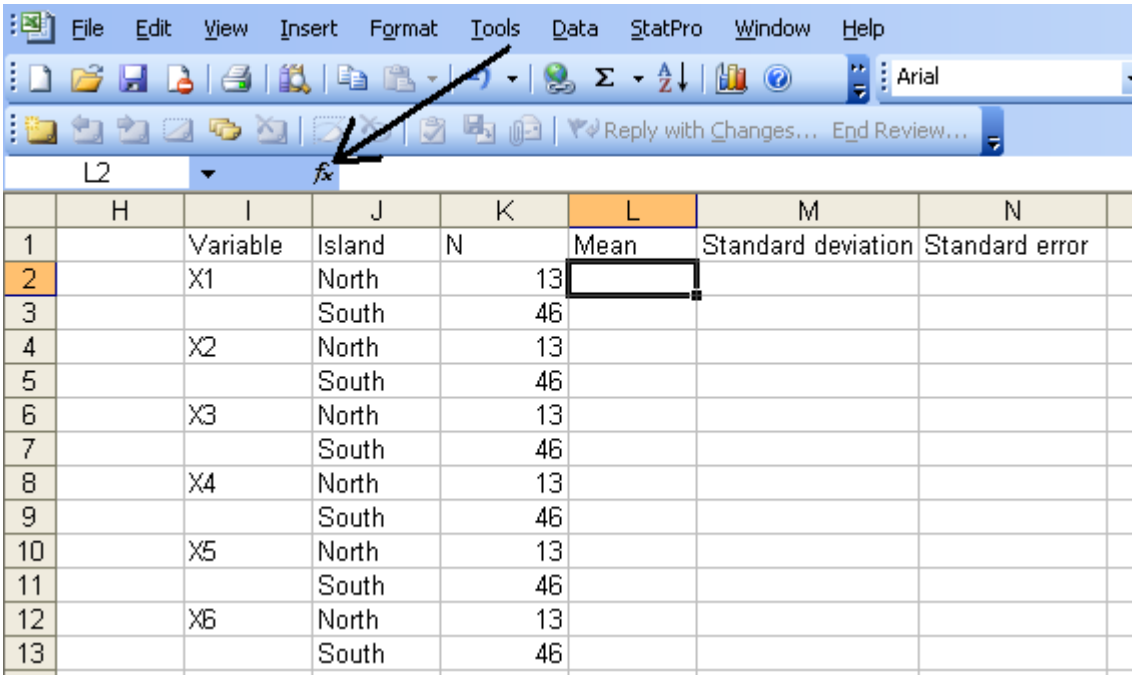
(It is a good idea to keep the original data intact and instead handle only a copy of the data. In this way, if we made a mess with the copy, we can still go back to the original, create a new copy and start our work again.)

(3) Draw the following table in the "Descriptive statistics" worksheet and fill it in using Excel's built-in functions.

Variable	Island	N	Mean	Standard deviation	Standard error
X1	North	13			
	South	46			
X2	North	13			
	South	46			
X3	North	13			
	South	46			
X4	North	13			
	South	46			
X5	North	13			
	South	46			
X6	North	13			
	South	46			

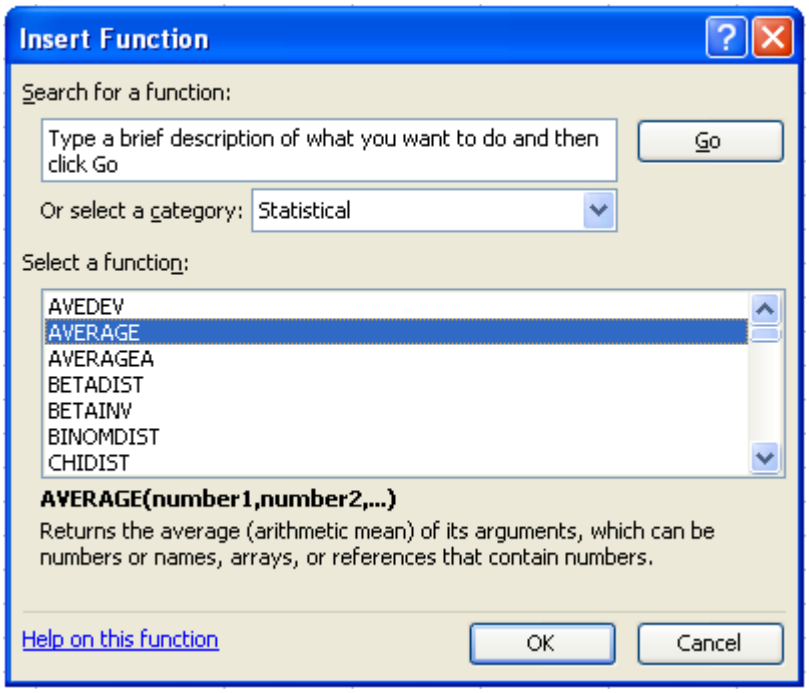
If you are not familiar with using Excel's built-in functions, follow the instructions on the following page. Otherwise, complete the table and go to step (4).

Select the first cell in the "Mean" column and click on f_x (Insert function) icon beside the formula bar.
(Clicking on f_x icon lets Excel know that we use one of its built-in functions.)

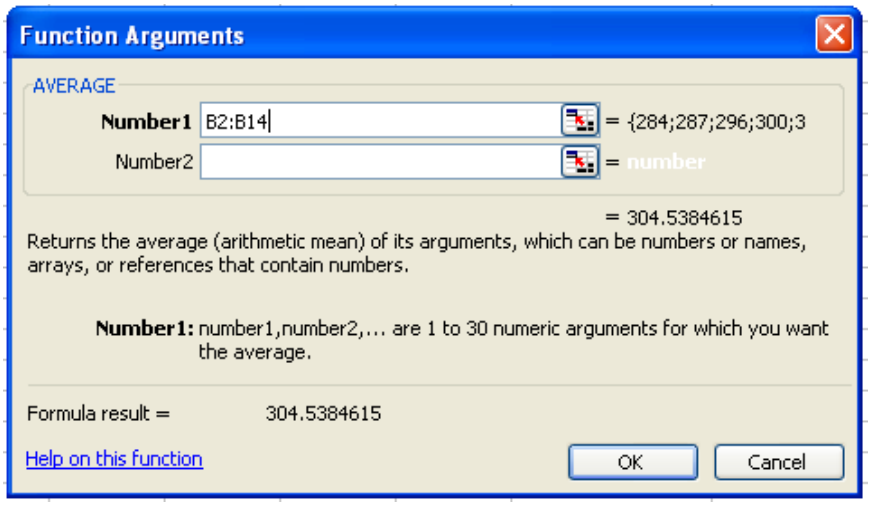


	H	I	J	K	L	M	N
1		Variable	Island	N	Mean	Standard deviation	Standard error
2		X1	North	13			
3			South	46			
4		X2	North	13			
5			South	46			
6		X3	North	13			
7			South	46			
8		X4	North	13			
9			South	46			
10		X5	North	13			
11			South	46			
12		X6	North	13			
13			South	46			

Select **AVERAGE** function in **Statistical** category as shown below.



Select the first 13 values of X1 variable with Island = 1, i.e. the X1 values of the sample from the North Island population, as shown below, and click on **OK.**



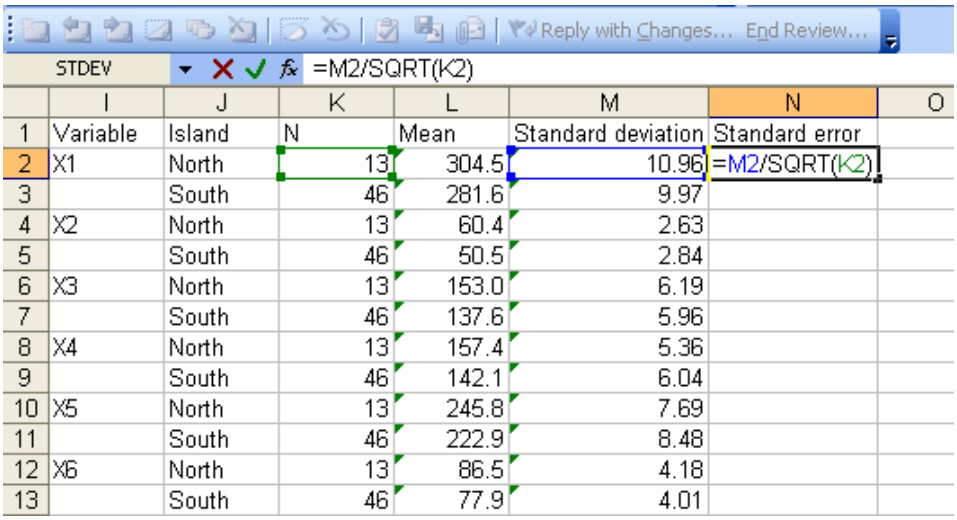
This displays 304.5, the mean of X1 from the North Island population, in the cell.

Move into the next cell in the "Mean" column, and repeat the same steps to calculate the mean of X1 for the South Island populations. Choose the 46 values of X1 with Island = 2 this time.

Repeat the above steps to complete calculating all mean values for the "Mean" column.

Move into cells in the "Standard deviation" column, and repeat the above steps but select **STDEV** function this time in **Statistical** category, instead of **AVERAGE** function. Complete the cells in the "Standard deviation" column.

(4) Move into the first cell in the "Standard error" column, and calculate the value using: Standard error = $\frac{\text{Standard deviation}}{\sqrt{N}}$ = Standard deviation/SQRT(N)



	I	J	K	L	M	N	O
1	Variable	Island	N	Mean	Standard deviation	Standard error	
2	X1	North	13	304.5	10.96	=M2/SQRT(K2)	
3		South	46	281.6	9.97		
4	X2	North	13	60.4	2.63		
5		South	46	50.5	2.84		
6	X3	North	13	153.0	6.19		
7		South	46	137.6	5.96		
8	X4	North	13	157.4	5.36		
9		South	46	142.1	6.04		
10	X5	North	13	245.8	7.69		
11		South	46	222.9	8.48		
12	X6	North	13	86.5	4.18		
13		South	46	77.9	4.01		

Complete the “Standard error” column.

You now should have the following table:

	I	J	K	L	M	N
1	Variable	Island	N	Mean	Standard deviation	Standard error
2	X1	North	13	304.5	10.96	3.04
3		South	46	281.6	9.97	1.47
4	X2	North	13	60.4	2.63	0.73
5		South	46	50.5	2.84	0.42
6	X3	North	13	153.0	6.19	1.72
7		South	46	137.6	5.96	0.88
8	X4	North	13	157.4	5.36	1.49
9		South	46	142.1	6.04	0.89
10	X5	North	13	245.8	7.69	2.13
11		South	46	222.9	8.48	1.25
12	X6	North	13	86.5	4.18	1.16
13		South	46	77.9	4.01	0.59

Congratulations! You have successfully completed this task.

Do not forget to save all the worksheets you created, as we need to use them later for other tasks.

Name your worksheets appropriately, so that you can recognise them later.