



# Statistics

## Exercises 11

You can use Excel to solve these exercises.

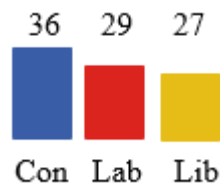
1. In order to study the yearly wages of madrileños, 20 different samples of wages of 200 Madrid residents were taken. The following table gives the mean and standard deviation of the wages for each sample:

Muestra	Renta media	Desv. típica	Límite Inf.	Límite Sup.
1	14576.74	7735.70		
2	14426.19	8404.71		
3	15315.30	13918.82		
4	14475.81	8391.22		
5	14823.26	8109.28		
6	14809.57	8535.56		
7	13409.65	7770.74		
8	15216.61	14076.63		
9	14689.04	10306.93		
10	16532.58	14489.93		
11	15224.08	13649.20		
12	14332.07	8500.20		
13	15480.38	8486.65		
14	14871.62	8774.67		
15	14929.64	13364.75		
16	14005.70	7411.58		
17	16465.93	17574.28		
18	14374.20	8618.72		
19	14352.96	7496.30		
20	14519.10	8776.46		

- a) Complete the table with the 95% confidence intervals for the true mean wage in Madrid generated from each sample.
- b) According to the last census, the mean wage in Madrid is €14989.2 per year. What proportion of the intervals contain the true value?
2. In a survey of 500 voters carried out before the elections in the Basque country, 180 said they would vote PNV and 160 said they would vote PSOE.
- a) Calculate the 95% confidence interval for the true proportion of PNV voters.
- b) Calculate an interval for the true proportion of PSOE.
- c) Do these intervals overlap? Comment on the results.
3. In 2004-2006 there were 511 men and 221 women in the European parliament. In 2006 a survey was carried out among the parliament members to see whether there should be a minimum quota of women. Of the 88 women who replied, 40 said that there should be quotas whereas, among the 184 men who replied, 46 were in favor of quotas.
- a) Calculate a 95% confidence interval for the proportion of women in favor of quotas.
- b) Calculate a 95% confidence interval for the proportion of women in favor of quotas.
- c) Do the intervals overlap? What conclusions can you draw?

4. The following headline about the UK elections comes from the Daily Telegraph of 1<sup>st</sup> May 2010.

**Conservatives rise 3 points in comparison to last week.**



Supposing that these results come from a simple of 100 people, calculate a 95% confidence interval for the true proportion of Labour voters in the electorate.

5. The following comes from an opinion poll in Andalusia (EGOPA), for winter 2015:

**Knowledge about and valuation of political leaders.**

Susana Diaz is the most well-known Andalusian political leader, being identified by 86.3% of Andalusians. She is followed by Juan Manuel Moreno Bonilla with 45.6% and Antonio Maíllo with 36%. A long way behind is Antonio Jesús Ruiz who is recognised by only 7% of the population. The leader of UPyD, Martín de la Herrán Sabick (4.4%) along with the leader of EQUO, Esteban de Manuel (3.4%) are the least recognized. The Andalusians give a fail grade to most of their political leaders, with the exception of Susana Díaz who receives a mean grade of 5 out of 10. She is followed by the leader of IU, Antonio Maíllo, with 3.9 out of 10 and Martín de la Herrán Sabick who gets 3.8. Juan Manuel Moreno and Estéban de Manuel obtain ratings of 3.7 on average and in last place is the leader of PA, Antonio Jesús Ruiz, with only 3.4.

**¿Do you know who occupies the presidency of Andalusia?**

	Frequency	Percentage
Yes	1036	86,3
No	164	13,7
<b>Total</b>	<b>1200</b>	<b>100,0</b>

**Mean rating of the President of Andalusia**

N	Mean	Standard deviation
<b>997</b>	<b>5</b>	<b>2,608</b>

- Calculate a 95% confidence interval for the true proportion of Andalusians who say they know who the President of Andalusia is.
- Calculate a 99% confidence interval for the true mean rating of Susana Díaz amongst Andalusians.

6. The following article appeared in the Sun on 5<sup>th</sup> April 2012.

### David Cameron's rating at new low



Results ... of YouGov poll for The Sun Published: 05th April 2012

**PUBLIC confidence in David Cameron's premiership has hit an all-time low, a YouGov poll for The Sun reveals today.**

Only 30 per cent said he would "make the best PM" — the lowest figure since he entered No 10. His rating has dived EIGHT points in a fortnight, after rows over donors, fuel, pasties and the Budget.

But Labour leader Ed Miliband has failed to take advantage. Only 19 per cent said he would make the best PM, up just one point in the last two weeks. Only five per cent thought Nick Clegg would be the best PM, down one point.

Forty-six per cent said they "don't know" who would make the best PM — the highest figure since May 2010.

Labour is on 42 per cent — 10 points ahead of the Tories. The Lib Dems are on 9 per cent, just one point ahead of the UK Independence Party.

The data are based on a YouGov poll of 1783 UK adults.

Calculate a 95% confidence interval for the percentage of people who want to vote Labour.