

## **Statistics for Social Sciences**

### **Exercises 1**

**PROBLEM 1.** Indicate which variables are qualitative and which are quantitative:

- **a)** Eye colour.
- **b)** Number of siblings.
- c) Public Madrid University attended.
- **d)** The height of a baby at birth.
- e) The newspaper you read most frequently.
- **f)** Telephone number of a student.
- **g)** The favourite food of students in the class.
- **h)** Who went to the party?
- i) How many people were at the party?
- j) Number of rooms in a hotel.

**<u>PROBLEM 2.</u>** Of the qualitative variables in the previous question, which are ordinal and which are nominal?

**<u>PROBLEM 3.</u>** Of the quantitative variables, which are discrete and which are continuous?

**PROBLEM 4.** It is wished to study the opinions of Madrileños on the possible Independence of Cataluña (strongly against, against, neither in favour nor against, in favour, strongly in favour). With this objective, it is decided to take a simple of 20 UC3M students. Define:

- **a)** The population of interest.
- **b)** The variable.
- **c)** What type of variable it is.
- **d)** The sample.
- e) The datum which corresponds with your opinion.

**<u>PROBLEM 5.</u>** In the previous question, does the way of choosing the sample seem reasonable? Comment your answer.

PROBLEM 6.	The	following	table	gives	the	union	memberships	of	100	different
workers:										

UGT	0033	Otro	CNT	UGT	0000	None	CNT	UGT	None
0033	0033	Otro	CNT	0002	CNT	CNT	Otro	Otro	CNT
None	Otro	None	None	CNT	Otro	None	None	Otro	0000
UGT	None	None	0000	Otro	None	0000	0000	None	CNT
UGT	None	None	UGT	UGT	None	Otro	Otro	CNT	Otro
CNT	CNT	0033	UGT	CNT	None	UGT	UGT	None	UGT
Otro	CNT	0033	UGT	Otro	CNT	None	UGT	CNT	Otro
Otro	None	UGT	None						
None	0033	UGT	CNT	None	Otro	CNT	None	0033	UGT
0033	UGT	None	0033	UGT	CNT	UGT	0033	CNT	UGT

- **a)** For each worker, the common characteristic, "Union of which they are a member", is defined to be a random variable. Why is it a variable? Why is it random?
- **b)** Is this a quantitative or qualitative variable?
- **c)** Count how many workers there are in the different categories and display the results in a table.

Note that you can use the countif(range;criterion) option to do this. If the criterion is non-numeric as here, you can put this between quotes, for example countif(A1:A5;"UGT").

Open an Excel worksheet and enter the data in cells A1:J10.

# **PROBLEM 7.** The following is a section of the New Zealand 2013 census questionnaire. Classify the variables in questions 23, 25, 29 and 31.

15 or older $\rightarrow go$ to 21 If you are aged less than 15 $\rightarrow go$ to 48	What is your highest secondary school qualification?	30 Mark as many spaces as you need to show all the ways you yourself got income in the 12 months ending today.			
21 Do you smoke cigarettes regularly (that is, one or more a day)?	NZ School Certificate in one or more subjects or	DON'T count loans because they are not income.			
DON'T count pipes, cigars or cigarillos.	National Certificate level 1 or NCEA level 1	wages, salary, commissions, bonuses, etc, paid by my employer			
Count only tobacco cigarettes.	NZ Sixth Form Certificate in one or more subjects or	self-employment, or business I own and work in			
no	National Certificate level 2 or NZ UE before 1986 in one or more subjects or	interest, dividends, rent, other investments			
22 Have you ever been a regular smoker	NCEA level 2 NZ Higher School Certificate or	regular payments from ACC or a private work accident insurer			
yes Made	Higher Leaving Certificate or NZ University Bursary / Scholarship or	<ul> <li>New Zealand Superannuation or Veteran's Pension</li> </ul>			
no your answer like this: —	National Certificate level 3 or NCEA level 3 or NZ Scholarship	other superannuation, pensions or annuities (other than NZ Superannuation, Veteran's Pension or war pensions)			
23 Which one of these statements best	<ul> <li>other secondary school qualification gained in NZ Print what it is:</li> </ul>	Unemployment Benefit			
describes your current legally registered	gunou in N2. 1 mit what it is.	<ul> <li>Sickness Benefit</li> </ul>			
marital/civil union status?		Domestic Purposes Benefit			
If you have had more than one legally registered marriage or civil union, answer		Invalid's Benefit			
for your most recent.	or other secondary school qualification gained overseas	Student Allowance			
I have never been legally married and I have never been legally registered in a civil upion	27 Apart from secondary school qualifications do you to another	other government benefits, government borne support payments, war pensions, or paid parental leave other sources of income, counting support payments from people who do not live in my household			
I am divorced or my marriage / civil union has been dissolved	completed qualifier.con? DON'T countertalifications at take the				
I am a widow / widower or surviving civil union partner	than 3 month u full- study to get.	or on source of income during that time			
I am permanently separated from my legal husband / wife / civil union partner		31 From all the sources of income you marked in question 70, what will the			
I am legally married	R b at you bightest qualification, and the	total income be:			
I am legally registered in a current on	an ubject, for example:	<ul> <li>that you yourself got</li> </ul>			
24 Do you yourself own, or par	qualification: TRADE CERTIFICATE	· before tax or anything was taken out of it			
dwelling that you usually live we and on without a mortgage)?	subject: ELECTRICAL ENGINEERING	<ul> <li>in the 12 months that will end on 31 March 2013</li> </ul>			
yes If you had the dwelling mea		loss See the			
no family trust, mark		zero income Guide Notes			
yes		\$1-\$5,000 your income			
25 If you are male $\rightarrow ao to 26$	aubiast	\$5,001-\$10,000			
If you are female, answer this question	+ Subject	\$10,001 - \$15,000			
How many babies have you given birth to?		\$15,001 - \$20,000			
number hom alive T		\$20,001-\$25,000			
		\$25,001 - \$30,000			
where the approximation $\rightarrow go$ to 26	29 Are you attending studying or enrolled	\$30,001 - \$35,000			
this question	at school or anywhere else:	\$35,001 - \$40,000			
	<ul> <li>full-time (20 hours or more a week)</li> </ul>	\$40,001 - \$50,000			
	part-time (less than 20 hours a week)	\$50,001 - \$60,000			
	or neither of these	\$50,001 - \$70,000			
		\$70,001 - \$100,000			
		\$100,001 = \$150,000			
		\$150,001 or more			

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Variable	Qualitative	Quantitative	Nominal	Ordinal	Discrete	Continuous
Question 23						
Question 25						
Question 29						
Question 31						

## **PROBLEM 8.** The following questions were asked in a Daily Record survey of Scottish opinions in June 2014:

- Should Scotland be an independent country?
- On a scale of 1 to 10, how likely is it that you would vote in a referendum on Scottish independence? (1 means absolutely certain would not and 10 absolutely certain would).

The technical information associated with the survey was as follows.

#### **Technical note:**

- This presents the topline results from Scotland
- Results are based on a survey of 1,003 respondents (adults aged 16+) conducted by <u>telephone</u>
- Fieldwork dates: 26th May 2014 1st June 2014
- Data are weighted by: age, sex and working status using census data; tenure using Scottish Household Survey data; and public-private sector employment using Scottish Government Quarterly Public Sector Employment series data
- Where results do not sum to 100%, this may be due to computer rounding, multiple responses, or the exclusion of "don't know" categories
- Results are based on all respondents (1,003) unless otherwise stated

In each case, what are the population, the variable and the sample size? Are there any factors that you think could bias the survey results?