UNIT 4: STATISTICS

CLASS EXERCISES:

1) I am planning on opening a shoe store for teenagers here in Córdoba, but I do know nothing about it. I've decided I am gonna ask young people about their shoe size. How many pairs of each size and model should I have in store? Twenty? But that's gonna take a lot of space.

a) Indicate two different ways in which I can perform the survey.
b) How many people do you think I should ask?
c) What are the population and the sample in my survey?
d) What's the random variable? Classify it.
e) Indicate the distribution of the random variable

2) Do you remember that year when Donald Trump won the election and turned the world into a complete mess? All the surveys were against him. We were all sure that Hillary Clinton would be the winner, so you can imagine our shock, the next morning, when we woke up to realize that something had gone wrong.

a) Indicate the population and the sample of the surveys.
b) What's the random variable? Classify it.
c) Do you know why all the surveys failed their predictions?
d) What should they have done then?

3) Ask all the people in the classroom about the number of siblings they have, including themselves. Then create a table of frequencies with the absolute and relative frequencies, the number of data and the percentages. You are a part of the classroom too.

4) Given the following table representing a random variable:

x_i	0	1	2	3	4
f_i	5	7	3	9	2

Create a table of frequencies with the number of data, the relative frequency, the percentages and the cumulative frequencies.

5) Given the following table representing a random variable:

x_i	1	2	3	5	6
f_i	4	7	9	5	2

Create a table of frequencies with the number of data, the relative frequency, the percentages and the cumulative frequencies.

6) The ISP of a group of people is given by the following table:

ISP	Movistar	Jazztel	Orange	Ono	Other
Clients	22	6	7	10	5

Represent the information using a bar chart

7) The population of Spain by age range in 2016 is given by the following table. Represent the information using a histogram

Age	People
(0,10]	4600000
(10,20]	4400000
(20,30]	4700000
(30,40]	6800000
(40,50]	7600000
(50,60]	6400000
(60,70]	4800000
(70,80]	3400000
(80,90]	2300000
+90	500000

8) Plot the frequency polygons in exercises 6 and 7

9) Given the following table representing a random variable, work out the mean, the mode and the median.

x_i	1	2	4	5	7
f_i	4	7	2	9	3

10) Given the following table representing a random variable, work out the measures of central tendency.

x_i	1	2	3	4	5
f_i	27	32	43	12	4

11) Given the following table representing a random variable, work out the measures of dispersion.

x_i	1	2	4	5	7
f_i	4	7	2	9	3

12) Given the following table representing a random variable, work out the measures of dispersion.

x_i	0	1	2	3	5	6
f_i	3	4	7	3	7	4

13) Given the following table representing a random variable, work out the measures of dispersion.

x_i	[0,6]	(6,12]	(12,18]	(18,24]	(24,30]
f_i	7	12	15	9	23

Exercise 1: Classify the following random variables:

a) Length of the horns of the unicorns in my garden
b) Number of times I go to the beach during the summer holidays
c) Type of pizza I ask for while I am watching a Spain football match
d) Number of transplants last year in Spain
e) Distance between Winterfell and King's Landing
f) Temperature of the fire that Daenery's dragons spit out
g) Height of the Wall that defends* Westeros

Exercise 2: Last Monday I went to the street market and I heard one of the sellers saying: "I prefer you take a size 38, because I only got one size 36." Could you explain why?

Exercise 3: Lately I have realized that green T-shirts are sold very cheap. There was a big pile in a store in Seville, one euro each. All of them green. Could you explain why? Should we fire somebody?

Exercise 4: I want to know how many hours a day Andalusian teenagers spend surfing the Internet and using social networks. I've chosen one thousand teenagers in each one of the Andalusian capitals and asked them about it.
Indicate the population, the sample and classify the random variable. Do you think my sample is a representative one?

Exercise 5: I want to know the rate of mortality (percentage) amongst the flocks of sheep in the mountains. I've asked a shepherd to jot down the number of sheep that died last year.
Indicate the population, the sample and classify the random variable. Do you think my sample is a representative one?

Exercise 6: I want to know if teenagers from Córdoba are going abroad this summer, and where, so I asked all the students from Bachelorette from La Salle. Classify the random variable, indicate the population and the sample and tell me if my study is a valid one.

Exercise 7: This table represents the number of times that a group of friends go to the cinema during a year

x_i	1	2	3	4
f_i	5	8	3	2

Work out the number of data, find the relative frequencies, the percentages and the cumulative frequencies

Exercise 8: Given the following table representing a certain random variable:

x_i	0	1	2	3	5
f_i	6	9	14	15	7

Work out the number of data, find the relative frequencies, the percentages and the cumulative frequencies

Exercise 9: Plot the bar charts, histograms and frequency polygons corresponding to the following tables:

a)

x_i	0	1	2	3	5
f_i	6	9	14	15	7

b)

x_i	[0,2]	(2,4]	(4,6]	(6,8]	(8,10]
f_i	6	9	14	15	7

Exercise 10: Given the following table representing a random variable, find the measures of central tendency

x_i	1	2	3	4	5
f_i	4	6	7	5	3

Exercise 11: Given the following table representing a random variable, find the measures of central tendency

x_i	[0,2]	(2,4]	(4,6]	(6,8]	(8,10]
f_i	5	7	4	7	1

Exercise 12: Given the following table showing the values and frequencies of a certain random variable

x_i	0	1	2	4	5
f_i	5	8	6	8	3

Work out:

a) The percentage corresponding to each value of the variable
b) The measures of central tendency
c) Pearson's coefficient of variation
d) The bar diagram, the histogram and the frequency polygon

Exercise 13: Given the following table showing the values and frequencies of a certain random variable

x_i	[0,4]	(4,8]	(8,12]	(12,16]
f_i	6	9	4	3

Work out:

a) The mode
b) The measures of dispersion
c) The bar diagram, the histogram and the frequency polygon

Exercise 14: Given the following table showing the values and frequencies of a certain random variable

x_i	0	2	4	5	6
f_i	4	8	2	8	5

Work out:

a) The measures of central tendency

b) Pearson's coefficient of variation

c) The bar diagram, the histogram and the frequency polygon

Exercise 15: Given the following table showing the values and frequencies of a certain random variable

x_i	[0,4]	(4,8]	(8,12]	(12,16]
f_i	5	10	7	4

Work out:

a) The percentage corresponding to each value of the variable

b) The mode

c) The measures of dispersion

d) The bar diagram, the histogram and the frequency polygon

Exercise 16: The grades of a student in ten math tests are given by the following table:

x_i	4	5	6	7
f_i	2	2	a	b

Find the values of a and b knowing that he has an average of 5.9