

Practice 2: Probability and Random Variables.

Available Points: 10 points.

Weight over the final mark: 10%

Assistant Professor: Jordi López-Tamayo

Target of the activity

The activity will consist in computing some statistical results dealing with units 1 to 4. Read carefully the following instructions in order, not only to solve the exercise, but also to upload correctly to the virtual campus your solutions file.

Related Competencies

The competencies that will developed in this activity, as they are specified in the Teaching program of Statistics I are to *Acquire the capacity to use statistical inference tools for decision-making in theoretical and real situations* and to *Knowledge and understanding of basic statistical calculations and the software tools used for them*, in this case MicrosoftExcel.

Technical Instructions and Statement

Student must read this document carefully.

1. Student must download the file **data_pr1_ [Student's NIUB].xlsx**. This MicrosoftExcel WorkBook is composed by two sheet:

- 1.1. **DataStudent.** In this sheet the Student will find his/her personal dataset that has been simulated specially for her/him. In **Figure 1** you can see the information of this file for Student **99999999**.

Figure 1. Sheet DataStudent. WorkFile data_pr1_ [Student's NIUB].xlsx

	A	B	C
1	1.- Discrete Distribution	Ci	ni
2		0	46
3		1	3
4		2	43
5		3	40
6		4	22
7		5	20
8		6	39
9			
10	2.- Discrete. Binomial $Y \sim Bn(25, 0.43)$	25	0.43
11	3.- Discrete. Poisson $Z \sim P(5)$		5
12	4.- Continuous. Uniform $U \sim U(1; 9)$	1	9
13	5.- Continuous. Exponential $V \sim E(0.3)$		0.3
14	6.- Continuous. Normal $W \sim N(21; 4)$	21	4
15	7.- $E(K)=130$		130
16	8.- $V(Q)=18$		18

Delivered Information:

- 1.- A Frequency table.
- 2.- A Discrete binomial distribution with parameters 25 and 0.43
- 3.- A Discrete Poisson with parameter equal to 5
- 4.- A Continuous Uniform distribution with parameters 1 and 9
- 5.- A Continuous Exponential distribution with parameter equal to 0.3
- 6.- A Continuous Normal distribution with parameters equal to 21 and 4.
- 7.- The Expected value of a random variable equal to 130
- 8.- The Variance of a random variable equal to 18.

- 1.2. **NumericValues.** In this sheet the Student will find his/her personal conditions related with the file **template_pr1_ [Student's NIUB].xlsx**. that has been simulated specially for her/him. In **Figure 2** you can see the information of this file for Student **99999999**.

Figure 2. Sheet NumericValues. WorkFile data_pr1_ [Student's NIUB].xlsx

	A	B	C
1	Question	PAR1	PAR2
2	q01		3
3	q02	2	5
4	q03		2
5	q04		8
6	q05	8	13
7	q06		8
8	q07		5
9	q08		7
10	q09	7	9
11	q10		4
12	q11	2	3
13	q12		2
14	q13		10
15	q14		20
16	q15	10	20
17	q16		27
18	q17		26
19	q18	23	25
20	q19		130
21	q20		18

You will see this information is equal to the information that will appear in your template. This is delivered in order the facilitate your computations in data file.

2. Student must download the file **template_pr1_ [Student's NIUB].xlsx**. This MicrosoftExcel WorkBook is composed by one sheet:

2.1. **template.** In this sheet the Student will find his/her personal information and the conditions in which the Student will have to develop the activity. Here you have an example in **Figure 3**:

Figure 3. Sheet Template. Personal Conditions of the Activity and Statement (In agreement Numeric Values of previous Workbook).


STATEMENT	STUDENT
Niub:	99999999
GroupClass:	1
01.- [0.5 points]. Discrete. $P(X \leq 3)$	
02.- [0.5 points]. Discrete. $P(2 < X \leq 5)$	
03.- [0.5 points]. Discrete. $P(X > 2)$	
04.- [0.5 points]. Discrete. Binomial. $P(Y = 8)$	
05.- [0.5 points]. Discrete. Binomial. $P(8 < Y \leq 13)$	
06.- [0.5 points]. Discrete. Binomial. $P(Y > 8)$	
07.- [0.5 points]. Discrete. Poisson. $P(Z = 5)$	
08.- [0.5 points]. Discrete. Poisson. $P(Z > 7)$	
09.- [0.5 points]. Discrete. Poisson. $P(7 \leq Z < 9)$	
10.- [0.5 points]. Continuous. Uniform. $P(U < 4)$	
11.- [0.5 points]. Continuous. Uniform. $P(2 < U < 3)$	
12.- [0.5 points]. Continuous. Uniform. $P(U \geq 2)$	
13.- [0.5 points]. Continuous. Exponential. $P(V > 10)$	
14.- [0.5 points]. Continuous. Exponential. $P(V < 20)$	
15.- [0.5 points]. Continuous. Exponential. $P(10 < V < 20)$	
16.- [0.5 points]. Continuous. Normal. $P(W > 27)$	
17.- [0.5 points]. Continuous. Normal. $P(W < 26)$	
18.- [0.5 points]. Continuous. Normal. $P(23 < W < 25)$	
19.- [0.5 points]. Given $T = 200 + 6 \cdot K$ compute the $E(T)$	
20.- [0.5 points]. Given $H = 50 + 2 \cdot Q$ compute the $V(H)$	
A VERY IMPORTANT NOTE	
You must introduce NUMBERS in assigned cells.	
Neither FORMULAS nor STRING characters are allowed.	
Pay ATTENTION with the DECIMAL CHARACTER that you use.	
If you have any doubt type the following formula in cell C8	
=b8/2. If it works you have a number otherwise you have a string	

As you can see, here there is information about the student **99999999**. This is his/her **niub** and is the same that the number that identifies the file **data_pr1_99999999.xlsx**. (You can download this demonstration file from virtual campus).

There is also some specific information related and how the student must to develop the activity (**rows 2 and 3**).

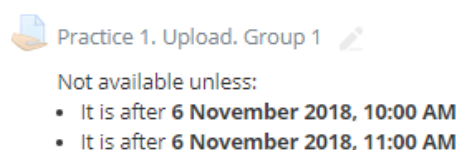
a) This Students belongs to the Class Group 1

All values you enter in the template have to be **rounded to three decimals**.

As you can see in **Figure 3** there are 20 questions (**Rows 4 to 23**) to solve and the student must to enter his/her **numerical** results in the cells assigned . No other cells of this workbook can be edited or changed. There are clear restrictions in order to enter numerical results in these cells. Read carefully the statement and the **VERY IMPORTANT NOTE (Rows 24 to 29)**.

3. Once the Student has fill the cells with his/her results, he/she has to save the file with the **same name and format** and to upload it to the virtual campus using the corresponding activity link (**Figure 4**) depending on the group that the Student belongs to (A or B, depending on how the class group has been splitted). In this case :

Figure 4. Link to upload the activity




VERY IMPORTANT NOTE (Rows 24 to 29)

If information entered by the Student in the assigned cells is not a number (BE AWARE WITH POINT DECIMAL CHARACTER), change the file name or change the computational format of the file (let's say change it to OpenScal or other Spreadsheets) will be his/her own responsibility and his/her activity won't be technically selected and the FINAL MARK WILL BE **ZERO**.

4. Once the files have been received, the coordinator of the activity will download all files with the solutions of all Students and will correct them publishing a personal report **report_pr1_[Student's NIUB].pdf** that Student will be able to download from the virtual campus. In case of Student 9999999, in Figure 5 you can see an example of this report: **report_99999999.xlsx**.

Figure 5. Student's Report of the activity.

DEPARTMENT OF ECONOMETRICS, STATISTICS AND APPLIED ECONOMY
 Business Administration and Management Degree
 Statistics I. Computing Practice 2. Probability and Random Variables
 Correction Date: 2018-12-13 12:30:41
 Final Mark: 9.5 [10 available points]
 Student's Information
 Niub: 99999999
 Class Group: 1



Statement	Student's Results	Computed Results	Mark(*)
01.- [0.5 points]. Discrete. $P(X \leq 3)$	0,62	0,62	0,5
02.- [0.5 points]. Discrete. $P(2 < X \leq 5)$	0,385	0,385	0,5
03.- [0.5 points]. Discrete. $P(X > 2)$	0,568	0,568	0,5
04.- [0.5 points]. Discrete. Binomial. $P(Y = 8)$	0,089	0,089	0,5
05.- [0.5 points]. Discrete. Binomial. $P(8 < Y \leq 13)$	0,684	0,684	0,5
06.- [0.5 points]. Discrete. Binomial. $P(Y > 8)$	0,818	0,818	0,5
07.- [0.5 points]. Discrete. Poisson. $P(Z = 5)$	0,175	0,175	0,5
08.- [0.5 points]. Discrete. Poisson. $P(Z > 7)$	0,133	0,133	0,5
09.- [0.5 points]. Discrete. Poisson. $P(7 \leq Z < 9)$	0,133	0,17	0
10.- [0.5 points]. Continuous. Uniform. $P(U < 4)$	0,375	0,375	0,5
11.- [0.5 points]. Continuous. Uniform. $P(2 < U < 3)$	0,125	0,125	0,5
12.- [0.5 points]. Continuous. Uniform. $P(U \geq 2)$	0,875	0,875	0,5
13.- [0.5 points]. Continuous. Exponential. $P(V > 10)$	0,05	0,05	0,5
14.- [0.5 points]. Continuous. Exponential. $P(V < 20)$	0,998	0,998	0,5
15.- [0.5 points]. Continuous. Exponential. $P(10 < V < 20)$	0,047	0,047	0,5
16.- [0.5 points]. Continuous. Normal. $P(W > 27)$	0,067	0,067	0,5
17.- [0.5 points]. Continuous. Normal. $P(W < 26)$	0,894	0,894	0,5
18.- [0.5 points]. Continuous. Normal. $P(23 < W < 25)$	0,15	0,15	0,5
19.- [0.5 points]. Given $T = 200 + 6 \cdot K$ compute the $E(T)$	980	980	0,5
20.- [0.5 points]. Given $H = 50 + 2 \cdot Q$ compute the $V(H)$	72	72	0,5

(*) A tolerance of +/- 5% has been applied.
 State of the Practice: Final Mark [X] Checking []
 Revision of the practice: Use teacher's visiting hours. Emails dealing with the practice won't be answered. Thank you.
 R-Script by Jordi López-Tamayo, - July 2019 -