Practice 2: Parametric and NonParametric Hypothesis Testing.
Available Points: 10 points.
Weight over the final mark: 5%
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.

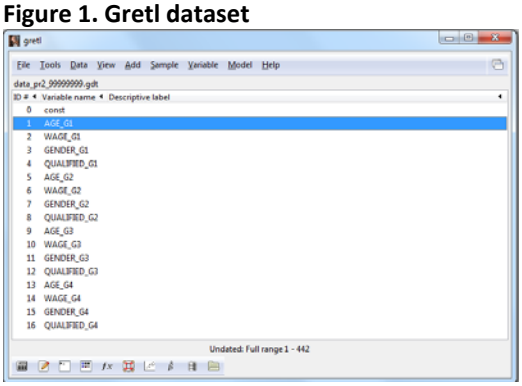
Related Competencies

The competencies that will developed in this activity, as they are specified in the Teaching program of Statistics II 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

1. Student must read this document carefully.
2. Student must download the file **data_pr2_ [Student's NIUB].gdt**. This is a Gretl data file and is composed by the following variables four variables Age, Wage, Gender (0 Man 1 Woman), Qualified (0 no 1 yes) and four Groups of workers: G1, G2, G3 and G4. Each **sample** of workers has a different size **n** and **different stochastic nature** for each Student**.** In **Figure 1** you can see the head of this file for Student **99999999**

Figure 1. Gretl dataset



3. Student must download the file **template_pr2_ [Studen'ts NIUB].xlsx.** This MicrosoftExcel WorkBook is composed by one sheet:
   3.1. **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 2**:

Figure 2. Personal Conditions of the Activity and Statement

	A	B
1	**STATEMENT**	**STUDENT**
2	Niub:	99999999
3	Alpha:	0.08
4	Class Group:	1
5	Workers Group:	1
6	Conditioning Gender:	0
7	Conditioning Qualification:	1
8	Group for comparison:	2
9	Mean for H1 in Point 08:	2277
10	01.- [0.5 points]. Number of observations of Group G1	
11	02.- [0.5 points]. Coeficient of Variation of Wage of Group G1	
12	03.- [0.5 points]. Interquartile Range of Wage of Group G1/Gender=0	
13	04.- [0.5 points]. Conditioned Median of Wage of G1/Qualified=1	
14	05.- [0.5 points]. Pearson's coeficient of correlation between Age and Wage of Group G1	
15	06.- [0.5 points]. Shapiro-Wilk's normality test in case of the Wage of G1	
16	07.- [0.5 points]. Chi-Square Statistic to test independence between GENDER_G1 and QUALIFIED_G1	
17	08.- [0.5 points]. If you do not reject the two-sided H0:Mean[WAGE_G1]=2277 enter 0. Otherwise enter 1	
18	09.1.- [1 point]. Test statistic for two-sided test H0: Mean[Wages/QUALIFIED=0] - Mean[Wages/QUALIFIED=1] = 0 in G1 (Unknown and Unequal vars)	
19	09.2.- [1 point]. Do you reject the null hypothesis with alpha=0.08? If do not reject enter 0, otherwise enter 1	
20	10.1- [1 point]. Test statistic for two-sided test H0: Var[Wages/QUALIFIED=0] / var[Wages/QUALIFIED=1] = 1 in G1	
21	10.2- [1 point]. Do you reject the null hypothesis with alpha=0.08? If do not reject enter 0, otherwise enter 1	
22	11.1- [1 point]. Test statistic for two-sided test H0: Proportion[QUALIFIED_G1] - Proportion[QUALIFIED_G2 = 0	
23	11.2- [1 point]. Do you reject the null hypothesis with alpha=0.08? If do not reject enter 0, otherwise enter 1	
24	***A VERY IMPORTANT NOTE***	
25	***You must introduce NUMBERS in assigned cells.***	
26	***Neither FORMULAS nor STRING characters are allowed.***	
27	***Pay ATTENTION with the DECIMAL CHARACTER that you use.***	
28	***If you have any doubt type the following formula in cell C7***	
29	***=b8/2. If it works you have a number otherwise you have a string***	
30		

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_pr2_99999999.xlsx.** (You can download this demonstration file from virtual campus).

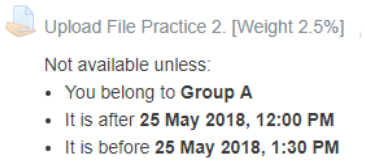
There is also some specific information related and how the student must to develop the activity **(rows 2 to 8)**.

a) If it is required, Student must to obtain his/her computations using a **level of significance (α) of 8%**.
b) This Student belongs to the Class Group 1 (1 **Group A** and 2 Group B).
c) Must to use information of the group of workers **G1.**
d) In some questions he/she must to obtain conditioned computations by gender. In this case the gender assigned is **0**, so conditioning by **males.**
e) In some cases, he/she must to compare groups, so in this case this student must **to compare his/her group G1 with the group G2.**
f) Finally, a value for the null hypothesis in point 08 is given. **In this case 2277.**
g) All values you enter in the template have to be **rounded to three decimals**

As you can see in **Figure 2** there are 14 questions **(Rows 9 to 22)** 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 23 to 28).***

4. 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 3**) depending on the group that the Student belongs to (A or B, depending on how the class group has been splited). In this case :

Figure 3. Link to upload the activity



VERY IMPORTANT NOTE (Rows 23 to 28)
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 responsability and his/her activity won't be technically selected and the FINAL MARK WILL BE ZERO.

5. 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_pr2_ [Student's NIUB].pdf** that Student will be able to download from the virtual campus**.** In case of Student **9999999**, in **Figure 4** (**next page**) you can see an example of this report: **report_99999999.xlsx**.

Figure 4. Student's Report of the activity.

DEPARTMENT OF ECONOMETRICS, STATISTICS AND APPLIED ECONOMY
Business Administration and Management Degree
Statistics II. Computing Practice 2. Parametric and NonParametric Hypothesis Testing
Correction Date: 2018-05-13 09:23:00
Final Mark: 10 [10 available points]

Student's Information
Niub: 99999999
Alpha: 0.08
Class Group: 1
Workers Group: 1
Conditioning Gender: 0
Conditioning Qualification: 1
Group for comparison:2
Mean for H1 in Point 08: 2277

Statement	S[*]	C[*]	M[*]
01.- [0.5 points]. Number of observations of Group G1	427	427	0.5
02.- [0.5 points]. Coeficient of Variation of Wage of Group G1	0.108	0.108	0.5
03.- [0.5 points]. Interquartile Range of Wage of Group G1/Gender=0	158.68	157.212	0.5
04.- [0.5 points]. Conditioned Median of Wage of G1/Qualified=1	2357	2356.965	0.5
05.- [0.5 points]. Pearson's coeficient of correlation between Age and Wage of Group G1	-0.213	-0.213	0.5
06.- [0.5 points]. Shapiro-Wilk's normality test in case of the Wage of G1	0.867	0.867	0.5
07.- [0.5 points]. Chi-Square Statistic to test independence between GENDER_G1 and QUALIFIED_G1	0.342	0.342	0.5
08.- [0.5 points]. If you do not reject the two-sided H0:Mean[WAGE_G1]=2277 enter 0. Otherwise enter 1	0	0	0.5
09.1.- [1 point]. Test statistic for two-sided test H0: Mean[Wages/QUALIFIED=0] - Mean[Wages/QUALIFIED=1] = 0 in G1 (Unknown and Unequal vars)	-0.365	-0.365	1
09.2.- [1 point]. Do you reject the null hypothesis with alpha=0.08? If do not reject enter 0, otherwise enter 1	0	0	1
10.1- [1 point]. Test statistic for two-sided test H0: var[Wages/QUALIFIED=0] / var[Wages/QUALIFIED=1] = 1 in G1	0.883	0.883	1
10.2- [1 point]. Do you reject the null hypothesis with alpha=0.08? If do not reject enter 0, otherwise enter 1	0	0	1
11.2- [1 point]. Test statistic for two-sided test H0: Proportion[QUALIFIED_G1] - Proportion[QUALIFIED_G2 = 0	-2.475	-2.475	1
11.2- [1 point]. Do you reject the null hypothesis with alpha=0.08? If do not reject enter 0, otherwise enter 1	1	1	1

[*] S indicates Student's Results, C Computed Results and M the Mark. 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.