ECONOMETRICS PROJECT

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/* PROBLEM 1 */

/* QUESTION 1 */

/* Initialization of the library "project" : */
libname project '/home/u60746058/ECONOMETRICS PROJECT';

/* To have the number of rows/observations in the dataset : */
proc sql;
 select count(*) label='Number of rows/observations in dataset'
 from project.gw2018;
 quit;

/* QUESTION 2 */

/* Qualitative variables / dummies : */
proc freq data=project.gw2018;
tables targeted_neighborhood treated1 treated2 any_school d_married tv_access
cable_access advice_pir voted;
run;

/* Quantitative variables : */
Proc means data=project.gw2018;
var age land hhsize num_women house_quality;
run;

/* QUESTION 3 */

/* Frequency table between age and treated2 : */
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proc freq data = project.gw2018;
tables treated2 * age / norow nocol;
run;

/* QUESTION 4 */

/* Study of the targeted_neighborhood variable for each village : */
proc freq data = project.gw2018;
tables targeted_neighborhood;
by village_code;
run;

/* Let's find the number of neighborhoods in each village : */
proc freq data = project.gw2018;
tables neighborhood_code;
by village_code;
run;




/* PROBLEM 2 */

/* QUESTION 1 */

/* cf. pdf */

/* QUESTION 2 */

/* Regression model M1 : */

proc reg data=project.gw2018;
model any_school=treated1 treated2;
title 'Model M1';
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run;

/* PROBLEM 3 */

/* QUESTIONS 1 & 2 */

/* cf. pdf */

/* QUESTIONS 3 */

/* Estimation of the model M2 by OLS : */

proc reg data=project.gw2018;
model voted=treated1 treated2;
title 'Model M2';
run;

/* Creation of the variable age2 : */

data project.gw2018;
 set project.gw2018;
 age2 = age * age;
run;

/* Estimation of the new model : */

proc reg data=project.gw2018;
model voted=treated1 treated2 age age2 any_school advice_pir house_quality;
title 'Model M2 Bis';
run;
```

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/* QUESTION 4 - a */

/* Creation of the variable treated : */

data project.gw2018;
 set project.gw2018;
 treated = treated1 + treated2;
run;

/* QUESTION 4 - b */

/* Estimation new model for a woman non-treated but living in a targeted neighborhood */

proc reg data=project.gw2018;
 model voted = treated targeted_neighborhood;
 where treated=0;
 title 'Model M3 Bis';
run;

/* Estimation of the model M3 : */

proc reg data=project.gw2018;
 model voted = treated;
 title 'Model M3';
run;

/* QUESTION 5 */

/* Regression of the model M3 : */

proc reg data=project.gw2018;
 model voted = treated;
 title 'Model M3';
run;
```

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/* We can also find the confidence interval this way : */

proc reg data=project.gw2018;
model voted=treated / clb alpha=0.05;
run;




/* PROBLEM 4 */

/* QUESTION 1-a */

/* Creation of the variable expected_women : */
data project.gw2018;
 set project.gw2018;
 expected_women = (hhsize*0.485)*0.49;
run;

/* QUESTION 1-b */

/* Histogram with both distributions : */
proc sgplot data = project.gw2018;
 histogram num_women / transparency=0.8 fillattrs=(color=blue);
 histogram expected_women / transparency=0.8 fillattrs=(color=green);
 density num_women / type=normal lineattrs=(color=blue) legendlabel = 'num_women';
 density expected_women / type=normal lineattrs=(color=green) legendlabel = 'expected_women';
 keylegend / location=outside position=bottom;
 xaxis label = "Normal Curves";
run;

/* QUESTION 2 */

/* Manipulation of the variable more_women : */
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```
data project.gw2018;
 set project.gw2018;
 more_women = num_women - expected_women;
run;

Proc means data=project.gw2018;
var more_women;
run;

/* QUESTION 3 */

/* Creation of the gender ratio variable : */

data project.gw2018;
 set project.gw2018;
 treated = treated1 + treated2;
 interact_treated_mw = treated * more_women;
run;

/* Regression of the M4 model : */

proc reg data=project.gw2018;
model voted = treated more_women interact_treated_mw;
title 'Model M4';
run;
quit;

/* Regression of the model with restrictions i.e. under H0 : */

proc reg data=project.gw2018;
model voted = treated;
title 'Model M4 (with restritions / under H0)';
run;
quit;
```

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/* QUESTION 4 */

/* Scatterplot : */
proc sgplot data=project.gw2018 noautolegend;
   title 'Linear Regression';
   reg y=more_women x=hhsize;
run;

/* QUESTION 5 */

/* Regression of the M4 model : */

proc reg data=project.gw2018;
model voted = treated more_women interact_treated_mw;
title 'Model M4';
run;
quit;
```