Automatic generation of personalized answers to a problem set using \LaTeX & Stata
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Introduction

- Econometrics or statistics course implies undertaking applied analysis of data.
- The usual approach is to offer a problem set to students based on a single database.
- The purpose is to make students practice close to reality problems, and assess their knowledge and understanding.
- Several books and websites provide databases for these purposes.
Issue: 1 problem set, 1 database, 1 answer

- **On the good side.**
  - Reaching the right answer is taken as a positive work and understanding.
  - Reinforces the student who did the work.
  - There is a sole right answer.
  - Ease of grading.

- **On the bad side.**
  - Copy and paste the answers and an analysis.
  - One student doing the right work is enough for cheaters to take advantage (copy and paste).
  - When the database is popular (book or website), this issue takes a worldwide dimension.
  - Regression analysis in books always shows positive outcomes and easy answers (a bit unrealistic).

- The whole purpose of the assessment vanishes. We end up knowing even less if the student learned or not.
Solution: 1 problem set, $n$ databases, $n$ answers

- Combine the use of Stata and \LaTeX.
- Take advantage that both software generate an outcome out of commands.
- Stata uses: `.do`.
- \LaTeX uses: `.tex`.
- Take advantage of writing a \LaTeX from Stata and the capabilities of the latter in processing an external software.
Gini and Pasquini (2006) clearly describe how to communicate Stata and \LaTeX.

The Stata Journal (2006)
6, Number 1, pp. 22–39

\textbf{Automatic generation of documents}

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How?

1. Write a .do solving the problem set.
2. .do includes commands to capture the outcome from Stata in local, graphs, outreg2, sutex, etc.
3. .do can write commands in a .tex file, including the results from the statistics above.
4. .do can invoke a .tex compiler and transform to .pdf.
On the good side

- The grading and assessment will evaluate the answer from a unique y correct, which is known beforehand.
- Reinforces the work done by a good student.
- Ease of grading.
- Students can not copy certain set of results.
- Students performs a piece of analysis upon an imperfect database, allowing him to go deeper into the regression results.
- Zero mistakes in reporting result.
- Zero effort in generate 2, 20 or 200 problem set’ answers.
- You only have to write the answer once.
On the bad side

- Control and care of the .do and .tex files.
- Time devoted to write program can be long, however to repeat it is a matter of minutes.
Ejemplo

/*DEFINE FIN DE COMANDO STATA*/
#delimit ;
/*DEFINE SENDERO PARA STATA*/
cd C:\rodrigo\project_lst_latex_stata_text;
/*CARGAR DATOS*/;
/*GENERACION MUESTRA 5% DE BASE DE DATOS ORIGINAL*/;
/*PARA CADA ESTUDIANTE*/;
local estudiante "Pedro Pablo"
foreach estudiante in ‘estudiante’ {
    sysuse nlsw88, clear;
    sample 5;
    save data\nlsw88\‘estudiante’\'.dta, replace;
};
/*INICIA DOCUMENTO LATEX*/;
local estudiante "Pedro Pablo"
foreach estudiante in ‘estudiante’ {
    file open reporte\‘estudiante’ using reporte\‘estudiante’\'.tex, write replace;
    file write reporte\‘estudiante’ ‘”\documentclass{article}”´ \n;
    file write reporte\‘estudiante’ ‘”\usepackage{graphicx}”´ \n;
    file write reporte\‘estudiante’ ‘”\setlength{\voffset}{-1in}”´ \n;
    file write reporte\‘estudiante’ ‘”\setlength{\textheight}{24.2cm}”´ \n;
Ejemplo

/*ESCRIBIR DOCUMENTO LATEX*/;
    file write reporte_'estudiante' '"\begin{centering}" \n \n;
    file write reporte_'estudiante' '"\textbf{Nombre estudiante:}' estudiante '" \n \n;
    file write reporte_'estudiante' '"\textbf{Respuestas curso econometría}" \n \n;
    file write reporte_'estudiante' '"\end{centering}" \n \n;
    file write reporte_'estudiante' '\n \n;
    file write reporte_'estudiante' '\n \n;
    file write reporte_'estudiante' '"\hrulefill " \n \n;
/*LLAMAR BASE DE DATOS*/;
    use data\nlsw88_'estudiante'.dta, clear;
/*PREGUNTA 1*/;
/*TABLA CON ESTADÍSTICAS DESCRIPTIVAS*/;
    sutex age wage hours ttl_exp tenure, labels
    minmax
    title(‘Estadísticas descriptivas’)
    placement(h!)
    key(tab:des_'estudiante')
    file(des_'estudiante'.tex) replace;
    file write reporte_'estudiante' '"\noindent \textbf{Pregunta 1.}Estadísticas desivas. " \n \n;
    file write reporte_'estudiante' '"\input{C:/rodrigo/project_1st_latex_stata_text/des_'estudiante'.tex}" \n \n;
/*FINALIZA DOCUMENTO LATEX*/;
    file write reporte_'estudiante' '"\end{document}" \n;
    file close reporte_'estudiante';
Ejemplo

/*COMPILA LATEX*/;
shell pdflatex reporte_‘estudiante’.tex;
shell bibtex reporte_‘estudiante’.tex;
shell pdflatex reporte_‘estudiante’.tex;
shell pdflatex reporte_‘estudiante’.tex;
/*ABRE ARCHIVO*/;
winexec ‘‘C:\Program Files\Adobe\Reader 10.0\Reader\AcroRd32.exe’’
‘‘C:\rodrigo\project_lst_latex_stata_text\reporte_‘estudiante’.pdf’’;