NXG Logic Instructor (v1.0) - Getting Started

NXG LOGIC, LLC.

April 11, 2019

1 Setting Preferences

Lecture/Exam Topic. It's a good idea to always set the preferences before making a run, since you will commonly need to attempt several runs in order to make a satisfactory output. Therefore, instead of having to edit the lecture topic during everyone run, just edit the header to state: Probability, or Linear Regression, or Inferential Hypothesis Testing.

Deadline days added to today's date. A typical value is 7 days, which is 1 week.

Paper size. Select the paper size you need: $8\frac{1}{2} \times 11$, or A4.

Typeface. Some users may like everything in roman (\rm), whereas others may want serif, \sf. Examples of these typefaces are: this is Roman typeface, whereas this is Serif typeface.

Default page headers and footers. You can tremendously increase the professional appeal of your lecture materials by using headers and footers in your lecture notes, quizzes, exams, and presentation slides. The Instructor package allows you to use headers on the upper left, center, and right, as well as footers at the lower left, center, and lower right edges of each page. The same header/footer values can be used an entire semester, and only require changing the lecture topic. A suggested example for header and footer default settings would be:

GS-5583   Linear Regression   Foundations of Biostatistics

2 Types of Runs

		Output file	
Type of run	**Remarks**	**for students**	**for instructor**[b]
Lecture notes with worked solutions	leaves out labels such as "Name:"	N/A	filenamekey.tex
Homework assignment with key (worked solutions)	Includes, "Name:", deadline	filename.tex	filenamekey.tex
Quiz or Exam for entire class	Includes "Name:"	filename.tex	filenamekey.tex
Student-specific Quizes or Exams[a]	Includes "Name: John Doe(from file)"	filename.tex	filenamekey.tex
Presentation slides	Landscape mode, \huge font-size	N/A	filenamekey.tex
Student Projects: Model-Building Strategies	Includes "Name:"	filename.tex	filenamekey.tex
Student-specific Projects: Model-Building Strategies[a]	Includes "Name: John Doe(from file)"	filename.tex, ProjectM_studentname.csv[c], ProjectL_studentname.csv[d]	filenamekey.tex,

[a] - Student-specific runs requiring opening an Excel file containing student names, which are then embedded into the exam(quiz, project) and key file. Note all exams and key are contained within the single file filename.tex and filenamekey.tex. In addition, there are multiple .csv data files with student names in the filenames.

[b] - "filename" in the table above is the filename you enter in the popup window at run-time. The suffix "key" is appended to the filename entered, indicating that the worked solutions are saved to this file.

[c] For student-specific model-building strategy projects involving multiple linear regression, the data file for each student is ProjectM_studentname.csv

[d] For student-specific model-building strategy projects involving logistic regression, the data file for each student is ProjectL_studentname.csv

3 Performing a Run to Generate an Output

Timing. It is a good habit to start using the program 2-3 days before a measurement (homework, quiz, exam, etc.) is assigned. This way, you can get a handle on the appropriate questions and total points. In addition, there's usually a topic that isn't covered, so you may have to expunge material that's generated by default for a specific topic area.

Making a run. The following steps are required for making an exam, quiz, or homework assignment:

1. On the main user screen, on the far right, select the run type: homework, quiz, exam, or slides (lansdscape orientation, and huge font size).

2. Next, select the lecture topic(s) by clicking the checkboxes for the selected topics.

3. Then, click on the green GENERATE button, and a popup will appear into which you need to input a filename like: homework1, midtermexam, or quiz3. During run-time, the program will output two files, one called, e.g., homework1.tex, and the key file with answers (worked solutions) called homework1key.tex.

4. Wait for the progress bar to become filled with its green color. When done, the two output files (filename.tex, filenamekey.tex) will be located in the output folder you specified.

Output format. Every run will always have only two output files (filename.tex, filenamkey.tex), where filename is the filename you specified at run-time. If you open an input Excel file with student names and then make a run for e.g. student-specific exams, there will still only be two output files. However, in this case, there will be a separate exam (homework, quiz, etc) for each student in the single filename.tex, and a key with answers for each student in the single filenamekey.tex file.

- It is a good habit to always make a PDF of the exam and key, and then store this in a folder for the class. You can also copy the .tex and key.tex files into that folder for record-keeping.

- If you have a teaching assistant (TA), then it is good practice to send the exam and key to the TA in PDF format, since they may not be a LaTeX user.

- It is never recommended to send the LaTeX files to a TA for compiling anyhow, since you will be responsible if (s)he didn't compile them in time to make copies for the students before exam time. If you send PDFs of the final product, there should never be an issue.

4   Student-specific Capabilities

Options: Student-specific Exams and Keys.   You can open an Excel file with student names arranged in a single column, or two columns with LASTNAME, FIRSTNAME, or FIRSTNAME, LASTNAME, and generate an exam and key for each student (all within the single .tex and key.tex files). In the current version, random parameters are not used for combinatorics or probability exercises; however, all of the table-based questions will be different for each student.

Student-specific questions that use different data are generated for the paired t-test, Mann-Whitney, Wilcoxon rank sum test, Wilcoxon signed rank test, covariance and correlation, ANOVA, Kruskal-Wallis, simple linear regression (one predictor), multiple linear regression(3 predictors), chi-square tables, McNemar, interrator agreement(kappa), trend test, sensitivity and specificity, ROC and AUC, and survival analysis. The power calculations use fixed parameters.

Student Projects for Model-Building Strategies (Multiple Linear Regression and Logistic Regression).   If you open an Excel file with student filenames and then select MBS Multiple Linear Regression or MBS Logistic Regression as topics (checkbox), a .csv datafile with simulated data (n=500) will be generated for each student in the output folder. The first output file, perhaps called project.tex will contain project questions for the MBS selected. The key file will contain all the regression results (univariate, multivariate) regression coefficients, ANOVA for linreg, regression diagnostics, DFBETAS, VIFs, and Hosmer-Lemeshow GOF table for 10 deciles (logistic).

5   Working with Teacher's Assistants

Keys and Grading.   If you have a teaching assistant (TA) who will grade homeworks, quizes, and exams, then you can simply email a PDF of the homework assignment and PDF of the key to the TA the night before the homework(quiz,exam) is assigned, and have them post the assignment online (or distribute to students). For exams, it's better to email the PDF of the exam to the TA the night before, so they can make copies for students in the morning, and then email the key (PDF) to the TA after the exam has been proctored (don't send an exam key to the TA before the exam, since they may have friends in the class to whom they send the key).

If an exam was generated for multiple students (Excel input file with student names), the TA needs to simply print the single PDF for the exam file, since the students' names will appear in the upper right header, as well as after the name entry on the top of the exam. Also, if the exam key was generated for multiple students (Excel input file with student names), there will be a table of contents in the key PDF with blue hypertext links to each student's keys with answers.