How to create a swirl module

1) **Get module templates and create properly named files on your computer**
    a) Create a new folder on your computer where you will store all **swirl** related files
    b) Get two Excel templates from the **swirl** administrative team and save them in this folder
        i) Module Information Template: *Module_Info.xlsx*
        ii) Module Content Template: *Module.xlsx*
    c) Using these templates, save **two unique files for each module** you design
        i) For your first module, name the files *Module1_Info.xlsx* and *Module1.xlsx*
        ii) For your second module, name the files *Module2_Info.xlsx* and *Module2.xlsx*
        iii) Repeat this pattern for as many modules as you wish to create
2) **For each module, fill in the appropriate information in the Module Information Template**
    a) Separate each package and/or data set you list with a single comma followed by a single blank space, as demonstrated in the template
3) **For each module, fill in the appropriate content in the Module Content Template**
    a) **swirl** currently supports four types of output to the user
        i) **Text**: Instructional text that shows up for the user in the R console
        ii) **Question**: Anything that requires an answer from the user
        iii) **Figure**: Any image that shows up in the R plotting window, which may include actual plots as well as instructional images built using R graphics tools (figures are individually customized by the instructor)
        iv) **Video**: Any video on the web that **swirl** will open (with the user's permission) in the user's default browser

b) **Each output to the user gets its own line** in the Module Content Template, beginning on row 2 (since row 1 holds the column titles)

i) Enter the desired output type (all lowercase letters) in the column entitled *Output.Type* and the entire row should change color automatically based on your entry

ii) Based on the desired output type, follow the instructions below for completing the remainder of the row

(1) Text

(a) Enter your desired text output in the *Output* column

(2) Question

(a) Enter the body of your question in the *Output* column

(b) Enter the appropriate question type (all lowercase letters) in the column entitled *Question.Type* according to the options below

(i) **Exact**: An exact numerical answer

(ii) **Range**: A numerical answer that is approximate and may fall within a range of values

(iii) **Text**: A text-based answer, generally comprising one or two words from the English language

(iv) **Command**: A command to be interpreted by R and executed in the console

(v) **Multiple**: A multiple choice question

(c) If the question is multiple choice, enter all possible answer choices in the *Choices* column

(i) Separate choices by placing them on their own line **within the same cell** (for Windows users, press Ctrl-Enter)

(d) Enter the correct answer to the question in the *Correct.Answer* column, based on the question type

(i) For **exact** questions, the correct answer is just a number

(ii) For **range** questions, the correct answer should be two numbers (the lower and upper bounds on acceptable answers), each on their own separate line **within the same cell**

(iii) For **text** questions, the correct answer is just the expected text response. If there are multiple acceptable responses, then just enter them on different lines **within the same cell**

(iv) For **command** questions, the correct answer is the R command exactly as you wish the user to enter it in the console

(v) For **multiple** (choice) questions, the correct answer is just the correct selection spelled out in full

(e) Finally, enter in the *Hint* column the hint that you wish the user to receive when he or she enters an incorrect response to the question

(3) Figure

(a) In the *Output* column, enter text that describes or somehow complements the figure you are displaying

(b) Since figures (generally R plots) are highly customizable, you will create in R a separate, self-contained R script for each figure you wish to display to the user

(c) Save each of these scripts in the same folder as your Excel spreadsheets

(d) In the *Figure* column, type the name of the R script corresponding to the figure you wish to display (including the .R extension)

(e) In the *Figure.Type* column, enter one of the two following types (all lowercase):

(i) **New**: This is a brand new figure (plot)

(ii) **Addition**: This is an addition to a figure (plot) already being displayed to the user (e.g. highlighting a particular point on a scatterplot that corresponds to a question you just asked)

(4) Video

(a) In the *Output* column, ask the user if he or she would like to view a video on the topic at hand

(i) Example: *Would you like to view a brief YouTube video on histograms?*

(b) In the Video column, type the web address (URL) where the video is located so that **swirl** knows where to find it if the viewer chooses to watch

(i) Make sure you specify the entire URL (e.g. http://www.youtube.com)

c) Use the *Notes* column, which is highlighted in yellow, to document any notes to yourself. These will not even be read by the **swirl** program and therefore the user will never see them.

4) Once you are satisfied with both your module Information and Content spreadsheets, email them to the swirl administrative team to put them into action!