R Markdown, Notebooks, and Web Apps

There are four rules that apply to all projects so far:

a) Follow instructions *precisely*. If I do not tell you what to write on a particular line, leave it blank.
b) Do not use any functions or approaches to problems that we have not yet learned in this course.
c) All code must be *scalable by sample size* unless specifically noted otherwise.
d) Any code using *magrittr* should contain a max of one verb per line.

Part 1 – Set up a new R Studio Project

Part 2 – R Notebook

In a file called week9_notebook.Rmd, using the Project 3 dataset (week3.csv), create a Notebook that does the following, under the following headings.

1. **R Studio API**. Load the API as usual.
2. **Libraries.** Import all needed libraries.
3. **Data Import.** Import week3.csv into a tibble that you will use for all subsequent analyses.
4. **Visualization.** Create a ggplot scatterplot containing both raw data and an OLS regression line between mean scores of Q1 – Q5 and mean scores of Q6 – Q10.
5. **Analysis.** Calculate the correlation between these two means and a p-value.

Part 3 – R Markdown PDF

6. Duplicate week9_notebook.Rmd as a new file called week9_pdf.Rmd.
7. Change the code in week9_notebook.Rmd to render a PDF with the following characteristics:
    a. Included bold headings but ensure nothing else is bold.
    b. Add a sentence describing the plot directly under it in an ordinary font.
    c. Remove the R Studio API heading, since the knit engine (much like shinyapps.io) uses the project directory as its working directory and does not have access to R Studio (or its API). You will need to revise other code to address this change.
    d. Do not display **any output** in the PDF from the Libraries heading.
    e. Do not display **any code** in the PDF from the Visualization heading (but show the heading).
    f. Add a bullet list following "Data Import" that lists the data cleaning steps done.
    g. Add a sentence at the end of the document in the following general format using your output data: The correlation was .56 ($p<.05$), which is (not) statistically significant.
8. Render the resulting PDF as week9.pdf in your **output** folder.

Part 4 – Web App

In a subfolder called "shiny", using the same dataset, create a web app with the following functionality:

9. Displays a scatterplot of the relationship between the Q1-Q5 mean and the Q6-Q10 mean.
10. Allows the user to select whether they see Male, Female, or All respondents (use these display options in this order, and default to "All") from a dropdown menu.
11. Allows the user to include or exclude participants that completed the assessment before August 1, 2017 (included by default).
12. Displays a copy of the entire dataset, including all original variables and the two new means. All columns should be correctly sortable.
13. Is available as an online app on shinyapps.io. Paste a link to this app in a comment in the final line of week9_shiny.Rmd.