Installing R / RStudio
Replicating RProject1 in RStudio

MIT 18.S096

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1 Download RProject1.zip

Download the file Rproject1.zip from the 18.S096 Stellar website to your computer and extract the project directory

"RProject1"

Note: use a specific path for the directory – do not save the directory on your desktop.

2 Download/Install R and RStudio

Download/Install R and the Rstudio desktop on your computer from:

`http://www.rstudio.com/products/rstudio/download/`

`http://cran.rstudio.com/`

After installing these applications, re-boot your computer to ensure that system-dependent environment settings are properly specified.

3 Running RStudio

Start the R-Studio application. From the top bar of commands

1. Select "File", then "New Project ...", then for the "Create Project from" option select "Create Project from Existing Directory"

2. With the browser that appears, navigate to select the extracted directory RProject1

   The R-Studio application opens with a 4-panel display:

   - The lower left panel is a console for typing R commands directly or viewing output from executed R commands
   - The lower right panel has tabs [Files|Plots|Packages|Help].
     (The file directory path is the *Project* directory "RProject1")

3. In the lower right panel, select the Files tab and open the file

   "Rproject1_script1.r"

   by clicking on the file name.

   The file will open in a new tab in the top left panel.

   - The top left panel of RStudio is the *Source* panel where you can create/edit/run/compile: R scripts, RStudio Sweave (Latex) files, and R Markdown/Notebook files.

4. Go to the file in the top left panel:

   "Rproject1_script1.r"

   Execute the script file using any of the following methods:

   - Pressing the 'Source' button at the top tool bar of the file, or
   - Highlighting commands in the file and pressing the 'Run' button or
   - Just type Control-Enter or Control-r (for Apple/Mac computers use Command-Enter or Command-r)

5. Test exiting R-Studio by typing either

   q()

   at the console, or from the Tool Bar at the top of R-Studio

   selecting File/Quit R.

   RStudio asks you to type 'n' or 'y' to not-save or save the workspace

   '.RData'

   You can type 'n' since the scripts are designed to load relevant R workspaces explicitly. However, it is helpful in large-scale projects to type 'y' so you can return to RStudio and start where you left off (with all R objects in the environment).

4 Editing/Running/Compiling Scripts in RStudio

When you restart R-Studio, the application should open automatically with the same panel of open files from your active project.

Also, it is convenient to start R-Studio in a project directory from the File Explorer/browser:

Double-click on the project file "RProject1.Rproj."

1. Restart R-Studio and go to the script file 'Rproject1_script1.r' in the top-left panel.

2. Use File/Save-as to save a copy of the script file to another name of your choice, e.g.,

   "Rproject1_script1_rev1.r"

   Change anything (or nothing) in the script file.

3. Create (compile) an html file with the commands *and* output of your new script file:

   - Press the "Compile Report" button
     (in the middle of the File-ed itor top-left panel).

   This functionality will be used to complete homework assignments that use R.

5 Using RSweave to Integrate Latex and R

1. From the Files tab in the lower-right panel of RStudio, open the R Sweave file

   'RProject1_IntroToR_Diabetes.Rnw'

2. Use File/Save-as to save a copy of the Sweave file to another name of your choice, e.g.,

   'RProject1_IntroToR_Diabetes_rev1.Rnw'

3. Change any text (or nothing) in the Sweave file, being careful not to change special latex-related syntax (highlighted in blue).

4. Create the pdf file corresponding to the Latex processing of the Sweave file by

   - Press the"Compile PDF" button
     (in the middle of the File-editor top-left panel).

   The pdf file is created in the project directory and can be viewed using an Adobe reader or can be viewed from RStudio by pressing the Adobe button just to the right of the "Compile PDF" buton.

   This functionality is extremely useful and fosters principles of reproducible research. R computations/output/figures can be incorporated into Latex-formatted pdf files which is easily reproduced from scratch or updated with new/revised data or new/revised analyses.