Getting Started with STAT 961

August 8, 2021

1 Setup

R and RStudio setup.

1. If you do not have R and/or RStudio installed, download and install these softwares by following the instructions here. If you do have RStudio installed, update it to the latest version by opening RStudio and clicking `Help -> Check for Updates`. If you do have R installed, update it to the latest version by following the instructions here. Open RStudio.
2. Install packages for compiling reports by entering the following commands at the console (labeled B in Figure 1):

```
install.packages("knitr")
install.packages("xtable")
install.packages("tinytex")
tinytex::install_tinytex()
```

3. If you are on a Windows machine, go to `Tools -> Global Options -> Terminal`. In the drop down box for `New terminals open with`, select "Git Bash".
4. Go to `Tools -> Global Options -> Sweave` on Windows or `RStudio -> Preferences -> Sweave` on Mac and select the options pictured in Figure 2.

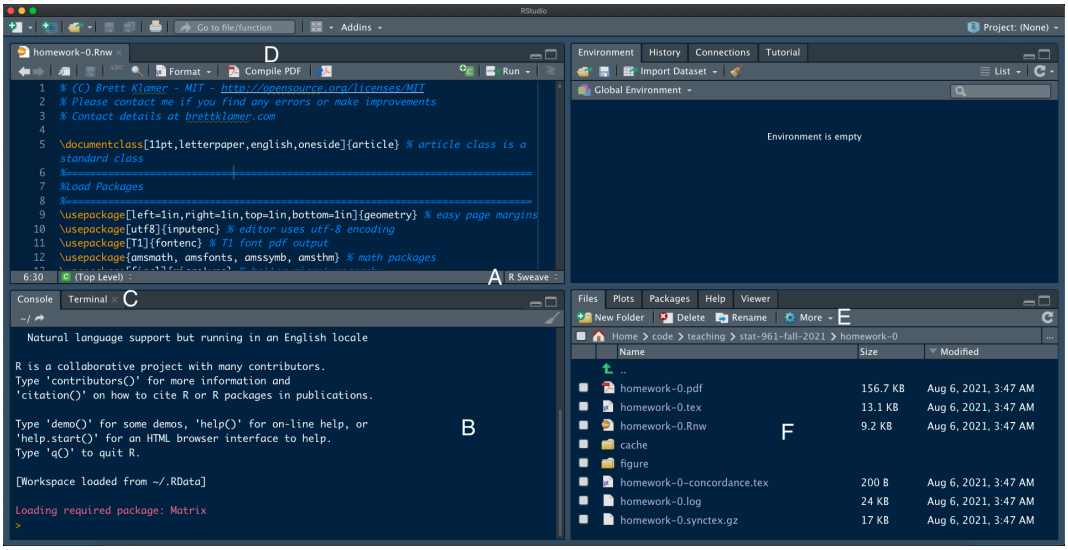

Figure 1: RStudio interface

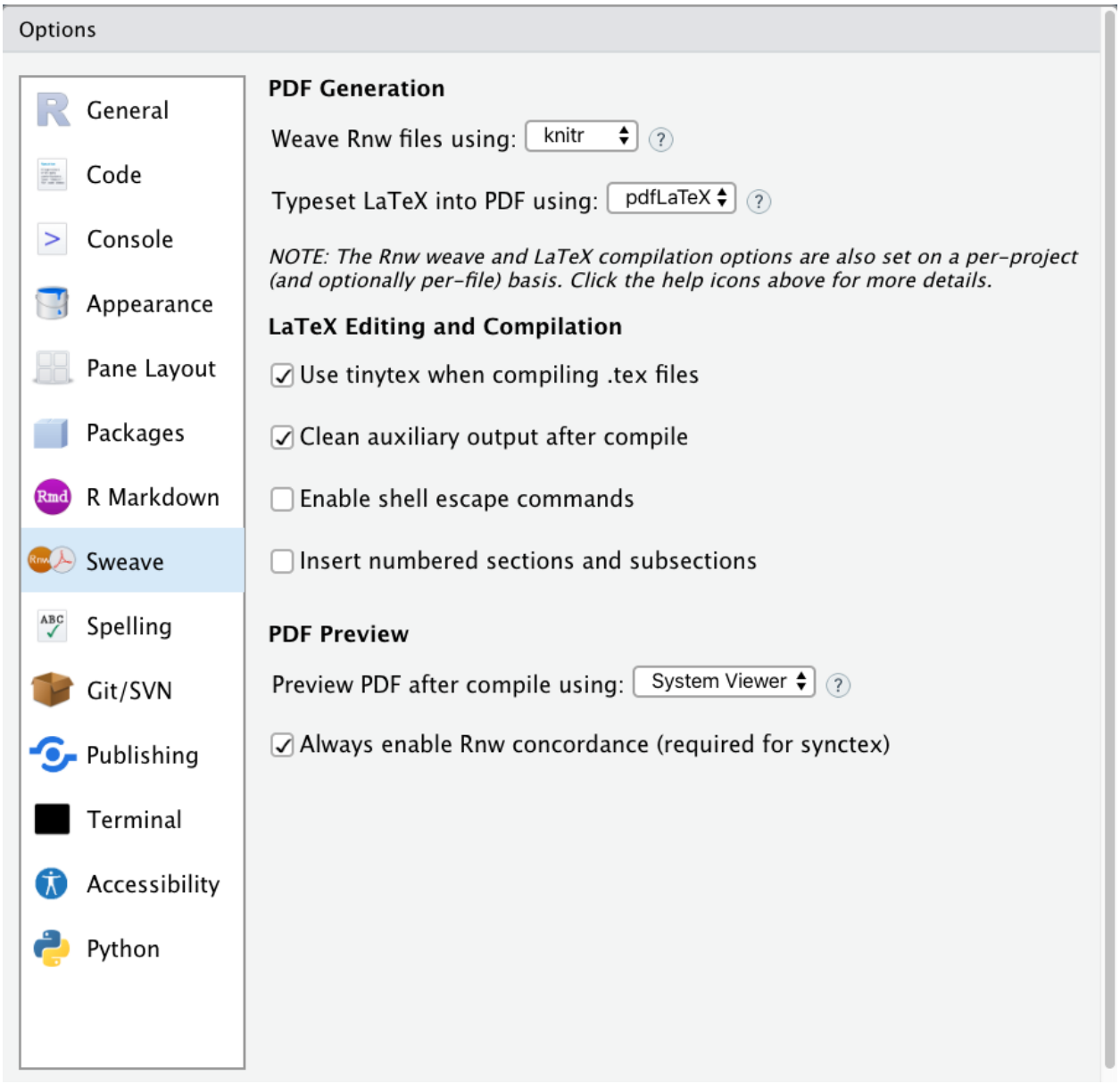

Figure 2: Options for PDF generation.

Git and Github setup.

1. Create an account on Github (if not already done so).
2. Create a repository on Github named `stat-961-fall-2021` by signing into your Github account, clicking "Repositories", clicking the green "New" button, choosing the options pictured in Figure 3, and clicking the green "Create repository" button.
3. Create a folder on your computer called `stat-961-fall-2021`.
4. Install Git by following the instructions here (if not already done so).
5. Open RStudio and navigate to the `stat-961-fall-2021` directory in the RStudio "Files" pane (Figure 1F). Click `More` -> `Set As Working Directory` (Figure 1E). Open the Terminal in RStudio (Figure 1C), click the down arrow, and click `Go to Current Directory`. (For Mac/Linux users, alternatively you can open a Terminal window outside of RStudio and navigate to the `stat-961-fall-2021` directory).
6. To set up Git (if not already done so), type the following commands in the Terminal, using your name and email address:

```
git config --global user.name "Your name here"
git config --global user.email "your_email@example.com"
```

7. In the terminal, type

```
git clone https://github.com/katsevich-teaching/stat-961-fall-2021.git
```

   This will copy the STAT 961 Github repository onto your local computer.

8. In the terminal, type

```
git remote set-url --push origin https://github.com/[USERNAME]/stat-961-fall-2021.git
```

   Here, "[USERNAME]" should be replaced by your Github username. This command will tell Github that any changes you make will be synchronized to your version of the class repository, as opposed to the main version.

9. In the terminal, type

```
git push
```

   This will have the effect of copying the contents of the repository to your personal Github account. Go to `https://github.com/[USERNAME]/stat-961-fall-2021` and check that this operation succeeded.

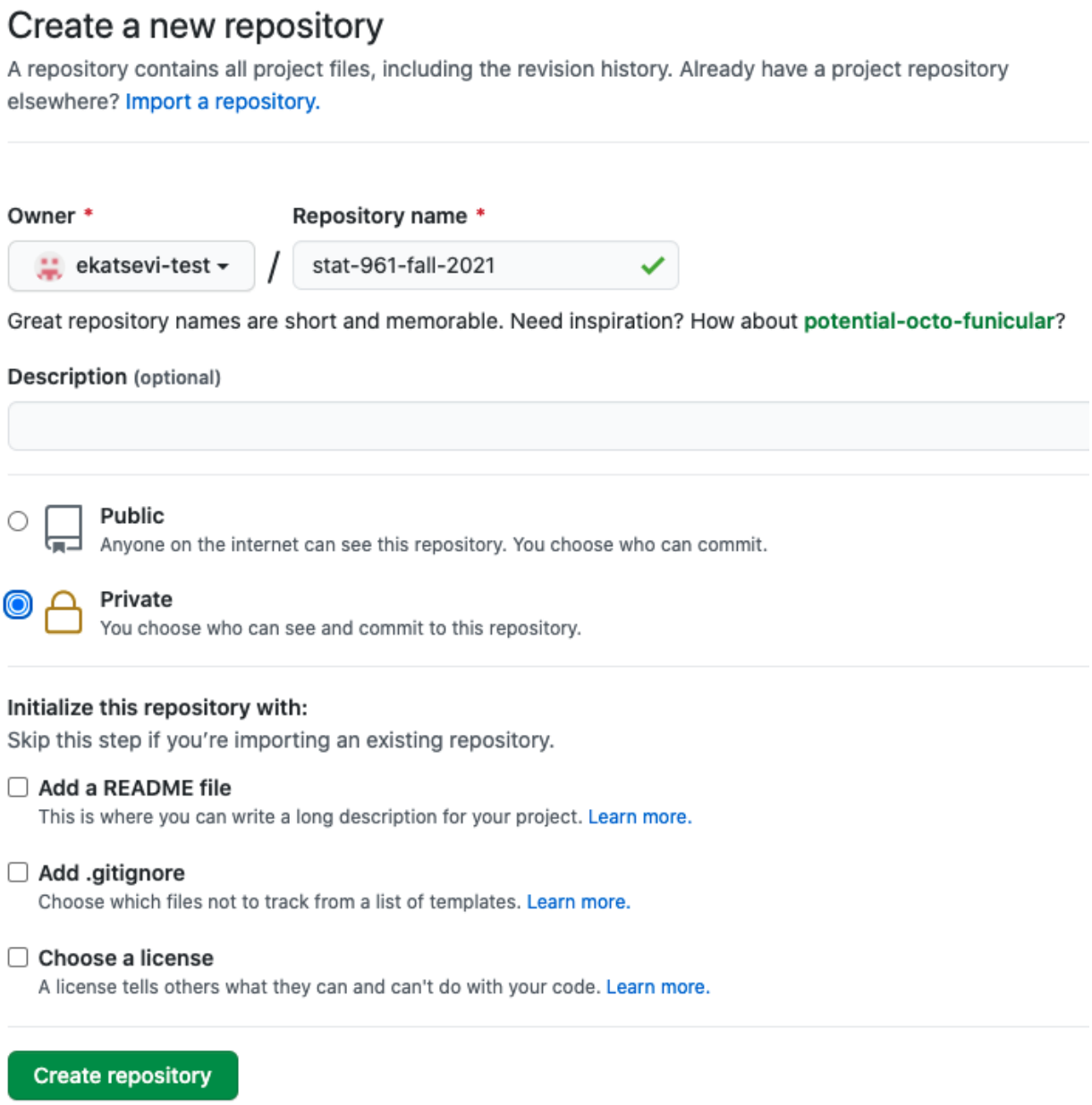

Figure 3: Creating a new Github repository for the class.

2 Course materials

2.1 Homework assignments

Assignment format. The homework assignment will be distributed as an Rnw document; see homework-0.Rnw for an example. This format facilitates the integration of LaTeX (for typesetting mathematical formulas) with R code (for statistical programming), producing a PDF report; see homework-0.pdf for an example. Read more about Rnw format here. For those unfamiliar with LaTeX, browse this webpage. Useful articles on this page are those under the heading "mathematics" as well as the article on cross-referencing.

Assignment download, completion and submission.

- **Download.** Homework assignments will be made available on the class Github repository (under the homework folder). To download the assignment, navigate to the `stat-961-fall-2021` directory on your computer in the Terminal (either through RStudio or a separate Terminal window), as in step 5 of the section "Git and Github setup" above. Then, pull the latest version of the class repository from Github by typing

  ```
  git pull
  ```

  Note that, if the repository has changed on Github and on your computer, then Git will automatically merge these two sets of changes. In this case, Git will automatically open an editor to allow you to type an informative message about this merge. However, a default message is already present and you do not need to change it, so simply close this editor. The default editor Git uses is Vim, and to close it you can type ":q" and then press enter.

- **Complete.** Open RStudio. Navigate to the directory (e.g. `homework-0/`) containing the homework assignment in the files pane (Figure 1F). Click `More` -> `Set As Working Directory` (Figure 1E). Then, click on the Rnw file (e.g. `homework-0.Rnw`) to open it in the RStudio editor. Select "R Sweave" from the menu in the bottom right-hand corner of the editor pane (Figure 1A). Change "FirstName LastName" to your first and last name. Work through the problems in the assignment, keeping the problem statements as they are and updating only the solutions between `\begin{sol}` and `\end{sol}`. When you make changes to the Rnw file, click "Compile PDF" near the top of the editor pane (Figure 1D) to update the PDF output file. It is convenient to place the RStudio and PDF preview windows side by side. To save your work, periodically *commit* it to Git by typing

  ```
  git commit -am "[commit message briefly describing the changes]"
  ```

  at the Terminal.

- **Submit.**

To complete this homework use the following steps:

1. Locate and open the file `homework-0/homework-0.Rnw` in the files pane (Figure 1F).
2. Change "FirstName LastName" to your first and last name in line 24.
3. Click "Compile PDF" near the top of the editor pane, and make sure the PDF compiled.
4. Stage the changes for committing by typing the following command in the Terminal:

```
git commit -am "[commit message briefly describing the changes]"
```

5. Commit the changes by typing the following command in the Terminal:

```
git commit -m "Changed name on homework 0"
```

6. Push the changes to your Github repository by typing the following command in the Terminal

```
git push
```

7. Submit compiled PDF to Gradescope.

2.2 Lecture materials