**How to use Github/Git/RStudio**

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**To get GitHub, Git, and RStudio setup (needs to be done just once, when you first start using Git/GitHub)**

1. Download and install the latest versions of R and R Studio.
2. Download and install Git (https://git-scm.com/downloads)
3. Create a github account online at https://github.com.
   1. Verify your email address (you should receive an email, click on the link inside)
   2. Email Haldre your username/email.
4. In R Studio
   1. Go to RStudio🡪Preferences 🡪 Git/SVN or Go to *Tools -> Global Options* 🡪 Git//SVN
      * 1. Make sure "Enable version control" is checked.
        2. Make sure Git executable says /usr/bin/git, or navigate to the 'gin' executable in the 'bin' folder. This is tricky. See below
        3. (optional) Make sure SVN executable says /usr/bin/svn
        4. Link GitHub to your version of R Studio by doing the following
           1. Hit "Create RSA Key". This creates the key in a popup window. Press Close.
           2. Click "View Public key" (only apparent after you create a key) and copy the output
5. In GitHub
   1. Go to settings. SSH and GPG keys. Paste the copied public SSH key here. This should link your version of Git and R Studio to your GitHub account.
   2. Accept invitation to EEB590. (email Haldre@iastate.edu if you don't have an invitation)
   3. Go to a Repository in EEB590. Click on "Clone or Download", and copy the URL.
6. In RStudio,
   1. Click "New Project"
   2. Choose "version control"
   3. Choose "Git"
   4. In "Repository URL", enter URL copied above
   5. Name the directory whatever you want
   6. Now you should see a Git tab on either the top right or bottom right window in R Studio.
7. In the Terminal/Shell (to get there, go to RStudio, and select Tools-> Shell; this will open up the terminal)
   1. Tell Git your name and email address. These are used to label each commit so that when you start collaborating with others, it’s clear who made each change. In the shell, type:
      1. *git config --global user.email "youremailaddress"* (replace "youremailaddress" with your email that you used for GitHub)
      2. *git config --global user.name "yourgitname"* (replace "yourgitname" with your GitHub username)
8. **Handling problems in this process:** 
   1. When all else fails, try shutting down and restarting R Studio.
   2. If you can't figure out where you git executable file is.
      1. ask the shell. Run the following command:
         1. which git (Mac, Linux)
         2. where git (most versions of Windows)
      2. Or follow directions here: http://stat545.com/git03\_rstudio-meet-git.html
   3. If you see this error in your shell:
      * error: unable to read askpass response from 'rpostback-askpass'
      * fatal: could not read Username for 'https://github.com': Device not configured
      1. Go to here for the solution: https://github.com/jennybc/stat540\_2014/blob/master/seminars/seminar92\_git.md
   4. Do you have a Mac upgraded to El Capitan? This upgrade moves an important directory that they need to re-install. Follow directions here.
      1. http://tips.tutorialhorizon.com/2015/10/01/xcrun-error-invalid-active-developer-path-library-developer-commandline-tools-missing-xcrun/
   5. If you are using an old operating system on a Mac, git might not show up for you. Follow instructions here to download the right version of git. <http://stackoverflow.com/questions/24215564/installing-git-on-mac-os-10-7-5>
   6. If R Studio does not seem to be talking with GitHub, you may need to use the SSH clone instead of the http. This is as simple as pushing the “clone as ssh” button when you go to clone/download in GitHub.

**For this class**

1. **Cloning**: If you just want to follow along with the R scripts from class, and make changes on your local computer, but not suggest changes to the master file, you should do fine with a clone of the repository.
   1. In Github,
      * 1. Click on the repository you want to clone/download.
        2. Click on "Clone/Download".
           1. Note- typically this uses https, but if you are seeing errors associated with the phrase “askpass” when you try to enter this URL in RStudio below, then try using the SSH key instead.
        3. Copy the URL.
   2. In RStudio,
      1. Click "New Project"
      2. Choose "version control"
      3. Choose "Git"
      4. In "Repository URL", enter URL copied above
      5. Name the directory whatever you want
      6. If you want to make changes to the R file, and save them separately from the course file, then use “save as” and rename your R file. This allows you to play around with it, saving it locally on your computer, and avoids the problem of unstaged changes conflicting with any updates on GitHub.
      7. If you don’t want to save your own changes, then you can just work off of the
2. **Forking**: If you want to save your own versions of the class scripts in your personal GitHub account, so you can play around with them, and possibly contribute to the master Rscript via a "pull request" if you have better/alternative approaches, then you can fork rather than clone. However, this makes it more difficult to pull any changes down, so I suggest you avoid this for now.
   1. In Github,
      1. Click on the repository you want to clone/download.
      2. Click on "Fork" in upper right side of page.
      3. Follow directions - it will ask you where you want to fork this repository to- pick somewhere in your GitHub account that is not part of the EEB590 Organization.
      4. Once you've forked it, go to that location, and follow directions for cloning/downloading above.
   2. In RStudio,
      1. Click "New Project"
      2. Choose "version control"
      3. Choose "Git"
      4. In "Repository URL", enter URL copied from GitHub "Clone/Download" button above.
      5. Name the directory whatever you want
      6. Now you can open the .R file and play around with it,
      7. Save it locally on your computer.
      8. You can also push changes back to your GitHub account. Let's practice this.
         1. Make some edits to R script.
         2. Save.
         3. Click on "Git" tab on bottom right panel.
         4. Check box next to the .R file.
         5. Click "commit". This will bring up a new window.
         6. Write a note in the commit box. Press commit.
         7. Then press "push" to push your commits to the online repository.
         8. Go onto GitHub, and check to see if those changes are present. Voila!

**To create your own repository**

1. You have two options:
   1. Create a project on R Studio, and then push to a new repository on GitHub
      1. On your computer
         1. Start a “new project” on R Studio, in the folder set aside for this project.
         2. Create a set of folders as you like them on your computer, and populate with data, documents, etc.
         3. Create an R Script in one of your folders, and save it.
         4. Commit all changes (except gitignore). This doesn’t commit to GitHub, only to Git.
      2. On GitHub
         1. Create new repository. Name whatever you want. Do not initialize with a readme.
         2. Scroll down and copy the code following “existing repository”.
      3. R Studio.
         1. Open Shell. Paste code from GitHub. Enter username and password if requested.
      4. This should create a link between Git and GitHub, and you should be able to push/pull now. To check, push the changes you committed earlier and then open GitHub to see if they have shown up.
   2. Create a repository on GitHub, and clone to your local computer/RStudio
      1. Click “New Repository”
      2. Give your repository a name (short)
      3. Choose public or private
      4. Click “Initialize this repository with a ReadMe”. This is a very important step to make the rest of the process easier.
      5. Now your repository has been created. You can upload files, and clone/download just like any other repository.
2. General notes
   1. If you make any changes, you will need to first “Stage” the files that you want to commit. Second, press commit, and when a new window pops up, write a commit message. Commit your changes.
   2. After you are finished working, you can push your changes to Github. You should have far fewer “Push”’s than “commits”.
   3. Usful for considering conflicts.
      1. http://eriqande.github.io/rep-res-web/lectures/conflicts-stashing-remotes.html