

EKN-812 Lecture 0

GitHub and RMarkdown Setup

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What is git?

- a version control system in very wide use across the public and private sectors, and academia
 - a program that keeps track of each version of each file you *commit* into a *repository*
 - think of this like a very powerful version of the “track changes” feature in Word
 - this is useful even when working by yourself, but especially when working with others
- git has many capabilities
 - easy to get overwhelmed by all the learning materials online
 - I am not an expert!
 - we will go through a simple workflow that will be enough for our class
 - then, I'll point you to some resources if you want to learn more

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git: Mechanics

- a *commit* is a snapshot of the state of all the files in your *repository*
 - commits are related to their “parents”
 - this creates a *history*
- either on the command line or via a graphical client (SourceTree, GitKraken, etc), you will
 - *stage* a file to be committed
 - compare the state of your working directory to the staging area, or across commits with `git diff`
 - once you're satisfied with your work, *commit* with a descriptive message, e.g. “added a scatterplot of exchange rates vs temperature”
- GitHub provides you with a platform for your *remotes* (can have none, or several)
 - you *push* changes from your local repo to the remote
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 - if there are *merge* conflicts, git will force you to resolve them and then commit manually

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What is GitHub?

- a code-hosting site
 - useful for collaborative software development
 - can also be used for research and teaching
 - alternatives: BitBucket, GitLab, SourceForge, others
- basic idea behind git is *distributed version control*
 - each developer has their own copy of the project (a *repository*)
 - can work independently on different parts of project
 - can experiment with different features in *branches*, again independently of others
- GitHub (or other code hosting sites) provide a convenient platform and set of protocols for merging and synchronizing work
 - we will mostly exploit the ability to distribute starter code or documents
 - and, you will submit homework using the platform

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Mechanics: How To Use It (Worst-Case)

- sign up for an account on github.com
 - please use your real name and upload a picture of yourself
 - this helps me learn your names!
- sign in and navigate to one of your repositories
 - for now think of this as a folder or directory
- from the web interface, you can
 - create plain-text files
 - upload other files (data, PDFs, images)
 - commit changes
 - remove files
 - compare ("diff") commits
 - keep track of priorities in the issue tracker

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- this workflow assumes you have
 - installed git on your local machine
 - created either SSH or HTTPS keys so you can push and pull to/from GitHub
 - authorized RStudio to commit, push and pull on your behalf
 - follow the installation instructions in “Happy Git with R” to do this
- each assignment will be created as a new repository for you
 - clone it down to your local machine
 - create a new branch immediately (at the command line `checkout -b my-new-branch`)
 - work on it (even offline), committing to your local repo as you see fit
 - when you're ready to hand in, push to GitHub and start a pull request
 - I will be able to see it and add comments; when ready we can approve the pull request and merge in the changes

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$$\frac{\partial f}{\partial K}(K, L) = \int_0^{\infty} \alpha(s)g(s)ds$$

- limits: $\lim_{x \rightarrow 0} f(x) = 1$
- equation referencing:

$$e^{i\pi} + 1 = 0. \tag{1}$$

Equation (1) ties together five fundamental constants of mathematics, and is considered very beautiful by mathematicians.

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