Research Methods , Fall 2024
Problems, Homework 7, Due: Monday, December 16 (midnight)

ℚ1. Read the remainder of the "Mathematical Background" document, if you are able. There will be no quiz nor any homework on the remainder of the material, but I am more than happy to answer questions that you have on the content that you read, and of course I appreciate you letting me know if you spot any typos or mistakes.

ℚ2. Write an abstract for your course project "paper" and include it in your document, which should now also include your introduction, mathematical background, and literature review sections. Your document should also include a title, author, and date—the idea is that, after adding these items and your abstract, it appears as a nice, formally written document! As usual, it must be prepared using LaTeX with references included using BibTeX. You have two options for submitting your final document:

(a) Submit a single PDF document using the submission link for this assignment on Course Site.

(b) Post a single PDF document on GitHub through a Git repository.

The latter option is explained further in the following question.

ℚ3. This question involves multiple parts and is designed to have you practice using Git and GitHub. The content of the *public* repository that you create can either be (*i*) the LaTeX source code and PDF for your course project "paper," in which case the submission of the final version of your paper would be accessible to me on GitHub, or (*ii*) junk files that you create that only contain junk content. Since the content will be accessible by anyone on the internet, it is your decision whether you want everyone to be able to see your paper. I encourage it, since most likely no one will find it and read it unless they intend to look for it, and since as researchers we should be comfortable posting things we write publicly for anyone to read :-). However, since this is only a course project and you might not want to share it publicly, you are not required to post your paper, and instead you can simply create junk files as long as you follow the same steps below to create and update your public repository.

(a) Create a public repository on GitHub using the instructions from the lecture slides. You can name the repository whatever you prefer (I suggest "ISE403" or "ISE403Project"), but any name is fine as long as you share with me the public link to your repository.

(b) Create a local repository on your computer from the remote repository on GitHub. Follow the instructions from the lecture slides, which in turn requires following some instructions on the GitHub documentation website. (Note: I recommend doing this step sooner rather than later so there is plenty of time to ask me questions in case you run into any issues.)

(c) Add to your local repository the LaTeX files for your paper (or junk files if you do not want to share your paper publicly). Add the files, then create one or more (local) commits. The final commit that you create before moving to part (d) should have the comment "Final commit in preparation for part (d) of the homework."

(d) Push your local changes to the remote repository. (On your remote repository, I should be able to find a commit that has the comment written in part (c) above.)

(e) Create and move to a new branch in your local repository. Add some junk content that you do not intend to keep, either in an existing file or in a new one, then create a new commit for this new branch. (At this point, a graphical interpretation of your repository should have the form shown on slide 31 of the lecture notes.) Run the `git log` command and take a screenshot of the terminal so that I can see that you are currently in the new branch and that a commit has been created in the new branch.

(f) Move back to your main branch in your local repository and add some junk or real content that you intend to keep or not, either in an existing file or in a new one. Create a new commit for the main branch. (At this point, a graphical interpretation of your repository should have the form shown on slide 36 of the lecture notes.)

(g) Merge the two branches of your local repository. It is *not* necessary that the merge create conflicts that you need to fix, but if it did, then be sure to resolve the conflicts and commit a new, clean version. Run the `git log` command and take a screenshot of the terminal so that I can see the new commit.

(h) Make one or more additional commits. The final commit that you create before moving to part (i) should have the comment "Final commit in preparation for part (i) of the homework."

(i) Push your local changes to the remote repository. (On your remote repository, I should be able to find a commit that has the comment written in part (i) above.)

(j) Look at the webpage for your remote repository on GitHub. Below the green "`<> Code`" button, you should see the number of commits that have been made to the remote repository. Click on that number and it should take you to a page where you can see all of the commits to the remote repository in a list. Do you see the history of the branch and merge that you conducted on your local computer? If yes, what do you see? If not, why do you think you do not see it?