Git Access Automation

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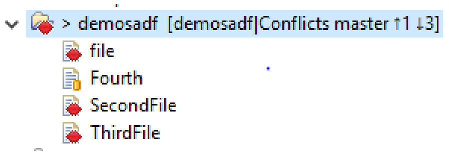
In all the programming I have done over the past few years there has been many recurring issues that range in severity from minor annoyance to program-crippling run-time errors. However there is one thing that has been far more prevalent than the others in my experience. One that without even being a problem within the code has caused me countless hours of frustration and actually having to physically travel miles to fix things. That problem is forgetting to synchronize with git. Everyone I know that has used git can tell me of an experience similar to this: You are in a time crunch for an assignment or project and you start fighting your way through debugging making minor changes to a bunch of files as you go. Then when it finally comes time to push you get a horrible message, commit rejected; Merge conflicts. These issues can take hours to solve, sometimes more than the coding itself and the most frustrating part is you could have avoided it had you just remembered to pull when you started working. Or how about another situation, it's Friday afternoon, you are working in the lab or at the office, and you finish up some work on a project. You have plans to visit your parents over the weekend so you head out that night and plan to get some work done over the weekend, but when you pull out your laptop none of your recent change are there, you forgot to push. If there's a deadline coming up you may have to redo a bunch of work or cut your trip short to go all the way back to the labs hours away. And again you could have avoided it had you just remembered to commit you work.

So these are issues of humans error, it was something simple that you just forgot to do. And these aren't just simple fixes. As a test I made four text files that took me about 2 min to write up in a git repo. Then I went onto the repo online and made some edits moved some stuff around, and did the same from Eclipse. When I went to push I got a bunch of conflicts (figure 1), I thought it would take me a minute to move the lines back the way they should be. But it took 10 minutes, (figure 2) five times the time it took me to make all the files and do all the edits in 2 places. And the main thing is that I had just done all it at one time, who knows how long it would have taken if I didn't remember exactly what they were supposed to contain, or had to reason about how they worked like with code. So I did it again with two simple java files, changed a couple names of variables, fixed a bug, all of which took me a couple minutes. Then came back a couple hours later and made some edits on the files and tried to merge. This time it took me 20 minutes to merge everything back together.These are huge time consuming issues that a human error. And there is no simple solution to it right now. Since it is just an issue of forgetting and most people would say just don't forget to do it. But when you are in a crunch under a lot of stress you make mistakes and that's also when you can spare the time to fix these things.

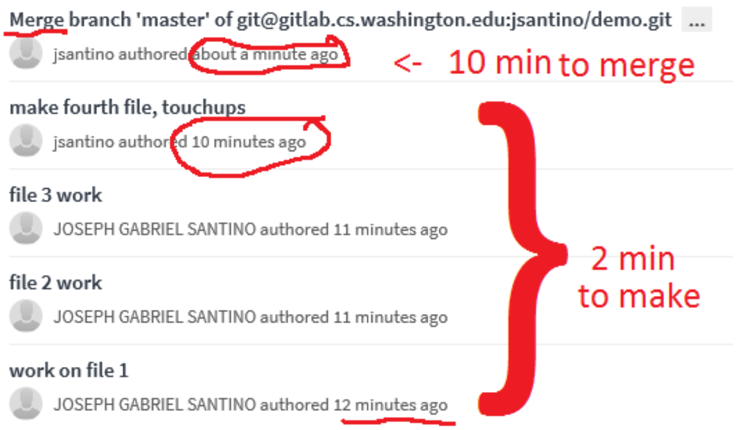
I propose that to solve this problem you take the human out of the equation, and automate the process to pull when you start and push when you finish. That way when you open your IDE you'll have all of the files up to date and can start working immediately without risk of spending your evening merging files when you wanted to go home. And when you are done and close you stuff, it pushes your changes for you to your branch so that you always have the most updated version of your program available in your repo. I think the biggest issue that will come up in working on this might be coordinating pushes to merge properly and try and handle cases where multiple are working off of one repo at the same time.

Figure 1



> demosadf [demosadf|Conflicts master ↑1 ↓3]
file
Fourth
SecondFile
ThirdFile

Figure 2



Merge branch 'master' of git@gitlab.cs.washington.edu:jsantino/demo.git ...
jsantino authored about a minute ago

<- 10 min to merge

make fourth file, touchups
jsantino authored 10 minutes ago

file 3 work
JOSEPH GABRIEL SANTINO authored 11 minutes ago

file 2 work
JOSEPH GABRIEL SANTINO authored 11 minutes ago

work on file 1
JOSEPH GABRIEL SANTINO authored 12 minutes ago

2 min
to make