A toolsuit for learning LC3

In 210 we learn the model computer LC3 (Little Computer 3), this is a purely theoriticle computer and exists to teach a simplified version of how computers actuially work. The model is used to show the basics of how computers process instructions and IO. I found that my learning experince was hindered by the outdated tooling that exists around this LC3, with the main simulator the clourse uses not even conforming fully to the model we learnt in class.

Many tools exist for LC3 but they are all some combination of:

- Hard to use.
- Highly outdated.
- Oppinionated away from the course textbook.
- Not avalible outside of windows.

So what do I offer?

In my free time I have created a simulator for the LC3 computer equipt with many tools to input and debug machine code and understand how the internals respond to input.

I have shared this tool online via a website 210tools.github.io and many people have already found benifeit in using this tool to study. It is fully cross platform with desktop apps for Mac, linux, windows, etc as well as a website you can accsess on your phone.

Of course this tool is not complete and I have a list of over 80 feture ideas that I could implement ranging from trivial to more work than everything I have done so far. I have, however, already done a large portion of work.

Here is a non-exhastive list of some of the key fetures of the tool:

- Full emulation of the LC3 system with respect to the course textbook.
- A hand written OS designed to be readable for students.
- A tokenizer and parser for the high level assembly language offering detailed errors for students to quickly correct syntax issues.
- Compilation to machine code and flashing emulator memory in one button in < 10 microseconds[1].
- Basic code editor with syntax highlighting

[1] On my machine, 500 lines of code.