MacOS Compilation Instructions for the Architecture Lab

Please read the whole homework text before these instructions to have a faint idea of what you're doing, to make this less confusing.

Before we begin, note that all paths are given relative to the `sim` directory under the architecture lab, unless otherwise specified. Also, remember to `make clean && make` every time instead of `make`ing directly to get rid of possible previous errors.

Base instructions:

1. First, make sure you have the CLI developer tools installed. You probably already do, but otherwise, attempt to `make` the architecture lab. This should prompt the installation.
2. `flex` and `bison` should be installed along with the developer tools. The versions are old but should still work. However, the libraries are named differently for some reason. Modify the linker flag under `misc/Makefile` from `-lfl` to `-ll`:
   `LEXLIB = -lfl # <- make this -ll`
3. With this simple change, you can now compile the architecture lab without the GUI, if you want to. You simply have comment out the `GUIMODE`, `TKLIBS` and `TKINC` variables inside `Makefile`, `seq/Makefile` and `pipe/Makefile`. If you want the GUI (and you should!), read on.

GUI instructions (after the base instructions!):

1. Now, we need the Tcl and Tk libraries. Some MacOSes already contain those for legacy compatibility, but the version is a little old. Instead, we will install a new version using `brew`. So, first install homebrew if you do not already have it, following the instructions at: `https://brew.sh/`
2. Then, install the necessary package using `brew`:
   `brew install tcl-tk`
3. After the installation, you should notice `brew` saying something like: "For compilers to find tcl-tk you may need to set:" and showing paths in the following lines. Those are exactly the paths we are going to set!
4. We have to modify the include and linker paths inside `Makefile`, `seq/Makefile` and `pipe/Makefile`:
   `TKLIBS=-L/usr/local/opt/tcl-tk/libs -ltcl8.6 -ltk8.6`
   `TKINC=-I/usr/local/opt/tcl-tk/include -DUSE_INTERP_RESULT`
   Make sure to put a different path after `-I` and `-L` if `brew` showed a different path.
5. With these changes, you should be able to compile the lab with the GUI. Good luck!

NOTE: It looks like the GUI becomes unusable in Dark Mode because it writes white text inside white boxes. If that's the case, try using Light Mode (switch from the Apple Icon → System Preferences → General).

These were tested on MacOS Catalina, but are somewhat experimental because I know next to nothing about Mac. In case you cannot get these to work and you're unsatisfied with using the GUI remotely over the ineks, send me an email at sayin@ceng.metu.edu.tr.