How to use LLVM to compile your Kaleidoscope toy language

Steps to get LLVM set up:

1. Use Linux. You can use Windows and follow this tutorial but it is not recommended as it can be complex. Instead, use WSL. We will assume that you have a Linux environment throughout this setup tutorial.

2. Run '**sudo apt update**' - The last thing you want is incorrect package information.

3. Now to install all the packages, run:

   sudo apt install `llvm-g++` llvm clang lldb lld

   sudo apt-get install libc++-dev libc++abi-dev llvm-dev

   This should get you all the required packages to 'compile' your toy compiler. However, note that some repositories don't have llvm-g++, which is perfectly fine! You will get clang++ from installing clang itself then.

4. Execute **llvm-config --version** to see which version of llvm you are using. A lot of llvm versions are not backward compatible, so this is crucial for resolving your dependencies in code.

5. To find an appropriate version of the Kaleidoscope frontend, go to this link and choose an appropriate branch corresponding to the llvm version you installed.

6. After you have the code on your system, you can compile your compiler using:

clang++ -g <input file> `llvm-config --libs all` -O3 -o <output>

We use **llvm-config --libs all** for linking the llvm libraries with your compiler code. We have entered ‘all’ for checking with all possible libraries, but it is ideal to use only what you need. For LLVM 10, you needed core, orcjit, and native. If so, the command would look like this:

clang++ -g <input file> `llvm-config --libs core orcjit native` -O3 -o <output>

7. If at some point you need clarification about which libraries to use, just check the CMakeLists in the repo!

All the best with compiling your compiler :)