

CSCE 531 Spring 2023 HW8

Due on Tuesday, March 28, 2023

Part 1.

Install BNFC on your computer.

Follow the steps described in sections 2.1 and 2.2 [R] and verify that you obtain the files described there for Haskell. For Haskell, continue to the end of “Running BNF for Haskell.” For Java, stop with the line before “make” on p.19.

Submit a pdf document with a script or screenshot showing the files in your directory of folder and, for Haskell, the result of running the example at the bottom of page 17. (One makefile will be renamed by BNCF; that is fine.)

Part 2.

Implement a calculator in Haskell as described in Section 2.6 [R].

Submit a pdf document with scripts or screenshots showing the files in your directory of folder and the result of running the command line input in sections 2.6.

Tips on how to complete HW8 successfully for CSCE 531 students, Spring 2023

Use a recent latest version of bnfc, version found at <http://bnfc.digitalgrammars.com/download/>, which includes other, older, versions. In turn, this site is linked to Arne Ranta’s textbook website, <http://www.grammaticalframework.org/ipl-book/>. (We refer to this textbook as [R].) (I use version 2.8.3.)

I strongly discourage use of Mac computers for this assignment. I use Windows 10. You may want to rename the current bnfc executable that you download and intend to use (e.g. bnfc-2.9.4.1-win.exe) to just bnfc.exe and set the PowerShell path to include the directory where you downloaded (or, better, copied after downloading) the bnfc executable file. Tips: you can find where an executable is in PowerShell by typing where.exe followed by the name of the executable; you can add the current directory to the path environmental variable in PowerShell by typing `$Env:PATH += “;$pwd”`; you can check the current value of the path environmental variable in PowerShell by typing `$Env:PATH`.

Make sure to read the errata linked to <http://www.grammaticalframework.org/ipl-book/>. An error in the last line of Calculator.hs is described there.

If you install the Haskell Platform (<https://www.haskell.org/platform/>), the Haskell compiler ghc and the interpreter ghci will be installed. If you installed the full platform for a version before 8.8, the lexical analyzer generator Alex and the parser generator Happy will also be installed. If you use a later version,

you will need to install them separately, using cabal (“cabal install alex”, for example, after “cabal update”). (I use version 8.10.1 for ghc, version 3.2.5 for Alex, and version 1.20.0 for Happy.)

Haskell uses implicit grouping by indentation. The book uses indentation properly. If you do not indent, you need to use braces.

The single quotes around div in program Interpreter.hs (middle of page 25 [R]) are single backquotes: `div` is correct, 'div' is incorrect. (In Haskell, backquotes around a function turn it into an infix operator.)

Windows users need to be aware that they need to use Linux-style echo and make.

echo in Windows PowerShell (which is started by Windows-X) works the intended way; it does not work in the intended way in a Command Prompt terminal; I suspect that the same is true of pipe (|). So: run your Calculator as in the middle of page 26 [R] from PowerShell.

make can be installed as described in <https://stackoverflow.com/questions/2532234/how-to-run-a-makefile-in-windows> (entry of Jul 15 '19 at 15:05):

- Step 1: Install the chocolatey package manager for WINDOWS (compatible to Windows 7+ / Windows Server 2003+) here (<https://chocolatey.org/install>)
- Step 2: Run choco install make