CS240 Operating Systems **Assignment 3** **Name:** Elisha Coad

Due date: 3/30/2020. (See instructions for deliveries below)

Objective: understand different shell functionalities and how one can add features to the shell.

In the last assignment you were asked to write the framework for our unix shell (called `msh`). Now that we have a basic shell we want to add several features:

Here is the general battle plan:

1) Your shell is to allow for inputting multiple commands separated by ";" e.g., *ls ; ps* will execute first *ls* then *ps*.

2) Your shell is to read input from a file called *mshrc* one line at a time and execute each line as a command.

3) Implement aliasing, i.e. define an alias and undefine it. If you don't know the unix syntax for aliases, go and find out.

4) Implement the feature to expend the PATH variable, i.e., logically this should implement New PATH = Old PATH + local path extension. This should be bash-compatible in syntax, e.g., *export PATH=$PATH:/usr/local/foo*

5) Implement a "history" mechanism, which will allow to display the last 20 shell commands (including duplicate commands and those that actually were unsuccessful).
    a. Typing *history* should display the entire history (but not more than 20 lines), while the numbers increment (i.e., the numbers are not bound by 20).
    b. Typing !! should re-execute the last command.
    c. You should be able to recall commands by number, e.g., !413 will re-execute the command line 413 (stored in your 20 item history).
6) Using the history mechanism in item 6) implement using the up and down arrow to scroll through history. Hitting return should execute the history command currently visible.

7) Implement piping. For example, *ls –al | more* will pipe the output of *ls* to *more*.

Deliverables: You need to turn in:
1) The assignment sheet with your name as a **cover sheet**.
2) The hardcopy of your well documented code.
3) A tar file called **CS240-Ass3.tar (**turned in via the *cscheckin* utility) containing
    a. All files necessary to test your shell.
    b. A text file called *ReadMe*, that states now to compile and run your shell