CSCE 313 Programming Assignment 3

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1 Parsing

User input is first parsed into tokens (separated by spaces). These tokens are assigned an input type that is determined by regex to show what should happen when they are executed in the shell. After being pushed back into a vector of tokens, the shell executes the sequence of tokens and performs the necessary operations.

The shell handles directory switching, commands, piping, and input + output redirection.

2 Piping

If the parser determines that more than one process will be executed, it will pipe the output of the previous process to the next. A new pipe() is created that connects the input of the new process to the output of the previous (stdin + stdout). The child process is started, the pipe is directed to the input of the child, and then the parent process is ended after its pipe is closed.

3 Redirection

When the shell determines that IO redirection is required, the files are opened for the corresponding read or write operation through the dup2() function. Similar to the pipe, fork() is used. The file redirection is treated like another process, and its corresponding stdin / stdout is piped. The process is then closed.