

CSC456 – Assignment 2

Description:

This program can be used to check the /proc folder for the user as well as to perform various system calls using fork and exec.

Libraries:

<iostream>: used for input from the keyboard and output to the console.
<string>: used for various string functions including to_string, substr, and find.
<fstream>: reading from /proc.
<vector>: used for creating a vector of ints and vector push_back function.
<stdio.h>: used for gets functions.
<string.h>: used for strcmp.
<sys/wait.h>: used for wait.
<sys/time.h>: used for getrusage.
<sys/resource.h>: used for getrusage.
<stdlib.h>: used for atoi.
<signal.h>: used for kill.
<fcntl.h>: used for open, creat, and O_RDONLY.

Program Structure:

The program is separated into three files: dash.cpp, functions.cpp, and dash.h. Dash.cpp contains the main function and handles user input and calling necessary functions. Functions.cpp contains the functions for the operation of the program. Dash.h is a header file that includes all library inclusions.

Functions:

string cmdnm(int pid)
 Gets the command name for given process ID.
void systat()
 Prints system information to the screen.
void redirection(char *args[])
 Redirects input from cin to file input.
void redirection_out(char *args[])
 Redirects output from cout to file output.
void change(char *args[])
 Changes current working directory.
void pipe(char *args[])
 Performs the same as pipes in Linux terminal.
void sig(char *args[])
 Sends signal to provided PID.

Compile Instructions:

A makefile has been created so typing “make” in the console while within the prog2 folder will automatically compile the program and name the resulting exe “dash”.

Should manual compilation be necessary the tag -std=c++11 must be used.

ex. g++ -std=c++11 dash.cpp functions.cpp -o dash

Program Usage:

The program accepts user input after the “dash>” prompt. The following are valid commands:

cmdnm [ID] – will print the command name of provided PID.

systat - will print system information.

cd [path] – will change the working directory to specified path.

[Unix command] > file – will perform unix command reading from a file instead of command line.

[Unix command] < file – will perform unix command outputting to file instead of to the console.

cmd1 | cmd2 – will perform cmd1 outputting through cmd2.

signal <signal_num> <pid> - will send given signal to provided PID.

exit – will exit dash.

Testing:

Tested each command to insure program does not seg fault or crash. Also tested for infinite looping. Blank space as an input was tested to insure it does not cause the program to crash.

Files Submitted:

prog2.pdf – Documentation file

dash.cpp – document containing main function

dash.h – header file containing library inclusions

functions.cpp – document containing all needed program functions

Makefile – file with necessary compilation commands