School of Computer Science, McGill University

COMP-206 Introduction to Software Systems, Fall 2022

Mini Assignment 1: Familiarizing yourself with Linux

Due Date Sept 14 18:00 EST

This is an individual assignment. You need to solve these questions on your own. If you have questions, post them on the Ed discussion board, but do not post major parts of the assignment code. Though small parts of code are acceptable, we do not want you sharing your solutions (or large parts of them) on the discussion board. If your question cannot be answered without sharing significant amounts of code, please make a private question on the discussion board or utilize TA/Instructors office hours. Late penalty is -20% per day. Even if you are late only by a few minutes it will be rounded up to a day. Maximum of 2 late days are allowed.

You MUST use `mimi.cs.mcgill.ca` to create the solution to this assignment. An important objective of the course is to make students practice working completely on a remote system. Therefore, you must not use your Mac command-line, Windows command-line, nor a Linux distro installed locally on your laptop. You can access `mimi.cs.mcgill.ca` from your personal computer using **ssh** or **putty** as seen in class and in Lab A. **If we find evidence that you have been instead using your laptop, etc., to do some parts of your assignment work, you might loose ALL of the assignment points.** As the first assignment consists of taking screen shots and doing file transfers, you are permitted to do those parts of the assignment on your computer. All of your solutions should be composed of commands that are executable in `mimi.cs.mcgill.ca`. You should also be using your SOCS Unix account for your assignment. **Not complying with this requirement will result in an additional 20% penalty.**

Questions in this assignment require you to take screenshots of your work. This will serve as proof that you have done this assignment by yourself. Instructors/TAs upon their discretion may ask you to demonstrate/explain your solution. No points are awarded for commands that do not execute at all. (Commands that execute, but provide incorrect behavior/output will be given partial marks.) All questions are graded proportionally. This means that if 40% of the question is correct, you will receive 40% of the grade. **Please read through the entire assignment before you start working on it. You can loose up to 3 points for not following the instructions** in addition to the points lost per questions.

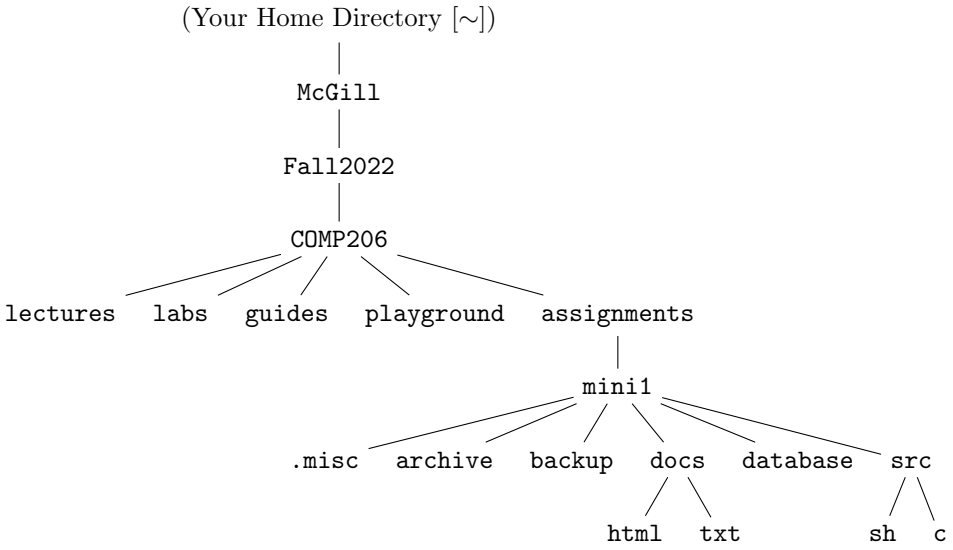
Lab A provides some background help for this mini assignment.
Total Points: 20

Ex. 1 — Familiarizing yourself with the File System (8 Points)

1. **(4 Points)** Your first task is to create a folder structure from scratch similar to the one given below, immediately under your home directory in `mimi`. The structure below represents a typical directory hierarchy that can be employed in developing complex software applications or working on your CS courses. Below, `McGill` is a subdirectory of your home directory (∼), `Fall2022` is a subdirectory of `McGill`, `COMP206` is a subdirectory of `Fall2022`, `assignments` is a subdirectory of `COMP206`, and so forth. After you have created the necessary directories, from your home directory, execute the following command.

```
$ tree -Fa McGill
```

This will display a folder heirarchy that conceptually looks like the tree structure given in the assignment (actual order and visual arrangement may be different - this is OK). Your screenshot should show most (if not all) of the commands that you used to create the directories. **Take a screen shot as an image and turn it in as EX1_1.PNG or EX1_1.JPG**



2. **(2 Points)** Next, starting from you home directory, use the `pwd` command to show that you are in your home directory. Then, perform the change directory command, `cd`, to the `mini1` directory that you just created in the above step. Now use the `pwd` command to show that you are in the `mini1` directory. The directory change **MUST** be performed using a single `cd` command execution that will take you directly from your home directory to the `mini1` directory, otherwise no points will be awarded.

3. **(2 Points)** Now use the `ls` command to list all the directories that are only **immediately** under the `mini1` directory (including all the hidden directories). The listing should also include the permissions and the owner/group names associated with each directory. (Therefore, this should demonstrate that you are the owner of these directories).

   Turn in a screen shot of your shell that shows clearly that you executed the `pwd` and `cd` commands from the previous question and the `ls` command. The screenshot must be an image, either EX1_2.PNG or EX1_2.JPG.

Ex. 2 — Exploring the files (8 Points)

1. (a) **(2 Points)** Use the `cd` command to move to the `/home/2013/jdsilv2/206/guides` directory. From this directory, use pipe to make the `ls` and `grep` commands (with appropriate arguments to them) to interact such that it produces the following output. The names and order of the files and the content format of the output should be the same.

```
drwxr-xr-x 2 jdsilv2 root       3 Jul 14  2021 Vim
-rw-r--r-- 1 jdsilv2 root   22682 Jan  5  2004 C-editing-with-VIM-HOWTO
$
```

   Turn in a screen shot that shows the command you executed and the output that it produces as EX2_1.PNG or EX2_1.JPG.

   (b) **(1 Point)** From here, copy the file `C-editing-with-VIM-HOWTO` into the `guides` directory you had created above using the `cp` command. For the remaining questions in this assignment, `guides` directory refers to the directory that you had created.

   (c) **(1 Point)** From inside the `guides` directory, execute the `pwd` command.

   (d) **(1 Point)** From within the `guides` directory, execute the `ls` command. Make sure that the `ls` command shows that the file was created by your user id, and its time stamp, size, etc.

   Turn in a screen shot that shows the `cp`, `pwd`, and `ls` commands and the output (if any) that they produce. Include all of it in a single screen shot, EX2_2.PNG or EX2_2.JPG.

2. (a) **(1 Point)** From within the `guides` directory, execute the `pwd` command.
   (b) **(1 Point)** Rename the file `C-editing-with-VIM-HOWTO` to `C-editing-with-vim-HOWTO.txt` using a single command.
   (c) **(1 Point)** From within the `guides` directory, execute the `ls` command. Make sure that the `ls` command shows that the old file name has been replaced by the new one.

   Turn in a screen shot that shows the `pwd`, `cp` commands and the output (if any) that they produce. Include all of it in a single screen shot, EX2_3.PNG or EX2_3.JPG.

Ex. 3 — Transfering files to and from mimi (4 Points)

1. In this exercise, you are going to transfer files between your personal computer and mimi using the File Transfer Protocol (FTP). Using your File Transfer program of choice (we recommend FileZilla or WinSCP), begin by connecting to `mimi.cs.mcgill.ca` (`sftp://mimi.cs.mcgill.ca` if using FileZilla) .
2. **(2 Points)** In your File Transfer program, on the remote side, make your way to the `docs` directory that you had created and upload the screenshots taken for the previous exercises from your personal computer to mimi. **Take a screenshot of the File Transfer program window showing that the files have been uploaded to mimi. Turn it in as EX3.PNG or EX3.JPG**
3. **(2 Points)** Again using your File Transfer program of choice, download the `C-editing-with-vim-HOWTO.txt` file in your `txt` directory to your computer. **Turn in the `C-editing-with-vim-HOWTO.txt` file.**

If you are using a command line file transfer utility (e.g. `scp`) instead of a GUI based file transfer utility such as FileZilla or WinSCP, make sure to include a listing of files in the directory of your local computer's terminal to demonstrate that those files were not present in your local computer (or **mimi** - depending on the direction of file transfer) before the copy process was executed and that they were present after the copy process were executed.

NOTE:- The prompt (`$`) in your command line interface will most likely look different than the above examples and will have your user id, etc., This is fine.

WHAT TO HAND IN

Turn in `C-editing-with-vim-HOWTO.txt` with the six screen shots, named properly as mentioned above (so that the TA can identify which screen shot is for which which question). You do not have to zip all of the files together. Re-submissions are allowed, but please try to upload all of the files again (and not just the modified ones) so that TAs do not have to go over multiple submissions to find correct files. Late penalty is applied across the entire assignment and not just parts. **You must upload all of these files to mycourses under the `mini 1` folder. You are responsible to ensure that you have uploaded the correct submission. No exemptions will be made! Please download your submission and verify their correctness if you are unsure.**

IMPORTANT!

If any of your screenshots have an error (in the commands, etc.), wrong commands, commands that did not have a purpose, etc., you must redo that whole screenshot. Please remember that file and directory names in Unix is case sensitive and must follow the exact names given in the assignment description. This may sometimes involve having to say, delete some directories, files, etc., basically doing some "cleanup" to restart a particular step. This may sound tedious and unnecessary, but remember this is a very simple assignment and its purpose is to make you practice some of the very basic elements to interact with Unix command line interface. So do not skimp on it. You may have to perform many of these steps regularly when you start working in a Unix environment. **Violating this will result in the points awarded for that screenshot to be reduced to half of what you would have otherwise received.**

QUESTIONS?

Please use Ed discussion board and tag it under mini 1. Emailing TAs and Instructors for assignment clarifications, etc., is not allowed. TAs and instructors may convert private posts to public if they are not personal in nature and the broader student community can benefit from the information (to avoid repeat questions). Also check the pinned post "Mini 1 General Clarifications" before you post a new question. If it is already discussed there, it will not get a response. You can email your TA only if you need clarification on the assignment grade feedback that you received.

HINTS

You may or may not need the below hints based on how you approach some of the problems.

- Find out what option you can pass to `ls` command to display the names in the reverse order.
- How do you indicate to grep to search case insensitive?

FOOD FOR THOUGHT!

The following discussion is meant to encourage you to search independently for creative and optimal ways to perform rudimentary tasks with less effort and does not impact the points that you can achieve in the above questions. It also contains some interesting variations of the original problem that will help you learn additional scenarios which you might encounter as you start working on regularly on a Unix system.

- Can you find a way in which you can create all the directories using a single command in Exercise 1.1?
- Typing in long (and several) file/directory names can be quite tedious while working on a Unix terminal. Can you find a way to work where the shell auto-completes names and shows your options to complete the names? **(DO NOT include this in your assignment screenshots - explore it separately)**.
- How can you copy multiple files at the same time from one directory to another?
- How can you copy directories as a whole?
- Can the copy command also rename the target file?
- How can you ask the copy command to prompt you instead of overwriting a target file?
- What are the different options passed to the `tree` command meant for? Do you see any similarities with the options you use with the `ls` command? Do you think keeping options and behaviour the same help adoption of new commands and software among the development community?