Lab 01: Getting started in the lab

CMPT 145

Laboratory 01 Overview

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Note: This lab has components that must be completed on a computer in one of the Computer Science labs.

Section 1

Pre-Lab Reading

Logging in

- Laboratory sessions are held in SPINKS 320 (Windows or Linux)
- Hardware and software is provided.
- The Lab TA (Evan) will assist you in logging in to your first lab.

Mac, Linux, Windows

- Three operating systems are supported in the Spinks computers:
  - MacOS
  - Windows
  - Linux
- Most students will have experience with one of these.
- It pays to have working knowledge of all three!
- Some future laboratory sessions will require use of Linux (UNIX).
  - Windows machines can be restarted in Linux.
  - MacOS computers are Unix already.

PyCharm and Projects

- Students coming from CMPT 141 will be familiar with PyCharm
- Students need to know how to:
  - Start PyCharm
  - Create a new Python 3 Project
  - Run scripts
  - Start the Debugger
- Your TA, Evan, will review these operations.
- Be patient on the first lab, as PyCharm may need extra time to start up the first time you run it.

Your work in CMPT 145

- Future CMPT 145 labs will require a small amount of work in UNIX.
  - UNIX may be new to you, but it's good to know!
- Linux or Mac is recommended for your Future labs.
  - If you really want to use Windows, you may have a harder work since Windows don't have UNIX tools installed.
- Your assignments can usually be done on PyCharm on any system (Linux, Mac, Windows).
- Sometimes an assignment question must be done on a UNIX system (Linux, Mac). We'll tell you when!

Network File Systems

- Modern computers/notebooks/tablets store documents locally by default.
  - Locally means your files will be store in one computer only.
- Network filesystems store documents and data on a remote computer.
  - Documents stored on networked filesystems are accessible from any computer connected to the network.
- When you log in to any Spinks lab computer, you are connected to the department's networked filesystems, and also the university's networked filesystems.

Your documents and data

- Python programs are documents (a.k.a. files).
- You could choose to store documents locally on a single computer.
  - Inconvenient! Local documents are not accessible if you move to another computer.
- You should choose to store documents (assignment work, lab work) on the network filesystem.
  - Convenient! You can change computers (even from Mac to Windows, etc), and your documents are accessible.
- You need to know where to put your documents and folders, and where to find them.

Your home folder

- When you log into a computer (Linux, Mac, Windows), you have direct access to a home folder.

If you log into…	Your home folder is …
Personal computer	local only
Departmental notebook	local only
Departmental desktop	network filesystem

- Your home folder is private to you, by default.
- Private means other users are prevented from accessing your home folder's contents.

Using a primary system

- When you are using a departmental desktop computer, your home folder is on a network filesystem.
- If you always save your documents on the network filesystem, you can access your documents from any department computer, and most university computers.
  - But describing all the combinations is confusing!
- The following information is from the perspective of student preference for one system or another.
- Your primary system could be the one you would prefer to use if you were allowed to choose: Windows, Mac, Linux.

Accessing Windows files

- Replace `abc123` with your NSID!

Log in on …	**Your Windows documents are in …**
Dept Windows	`V:\cmpt\cswin`
Dept Mac	`smb://cabinet.usask.ca/work$/abc123/cmpt/cswin`
Dept Linux	`smb://cabinet.usask.ca/work$/abc123/cmpt/cswin`
Campus Windows	`\\cabinet.usask.ca\work$\abc123\cmpt\cswin`

Accessing MacOS files

- Replace `abc123` with your NSID!

Log in on …	**Your Mac documents are in …**
Dept Mac	`/student/machome/abc123`
Dept Windows	`M:\`
Dept Linux	`/student/machome/abc123`
Campus Windows	`\\csfiles.usask.ca\machome\abc123`

Accessing Linux files

- Replace `abc123` with your NSID!

Log in on …	**Your Linux documents are in …**
Dept Linux	`/student/abc123`
Dept Mac	`/student/abc123`
Dept Windows	`H:\`
Campus Windows	`\\csfiles.usask.ca\abc123`

Make the network work for you

- Choose any system to be your primary system.
- Save all your work (Python scripts, Word docs, data, etc) in your primary system's home folder.
- Don't be afraid to move to other computers in the lab.
- Each system has a different home folder, but your primary system's home folder is accessible from any department computer.
- Sometimes, an application might present you with a default `Save As...` location that is not in your home folder. Be careful to check!
- Revisit these notes when you move to a different system!

Section 2

Laboratory Activities

ACTIVITY: Placing files on File Systems

- Using any software (NotePad, TextWrangler, etc), create a text file called `lab1fs.txt` containing the following text:

> This file was created on a OSTYPE computer in ROOM.

- Substitute something appropriate for:
  - OSTYPE: Windows, Mac, Linux.
  - ROOM: The room or lab you are in
- Save your file on the network file system for all three OSTYPE: Windows, Mac, Linux.

ACTIVITY: Placing files on File Systems

- Write yourself a note about how to find your file `lab1fs.txt` on all three systems.
- You'll copy/paste in this note to your `lab01-responses.txt` file to hand in.

ACTIVITY: A small Python exercise

- Create a new Python project in PyCharm, called Lab01.
  - Avoid spaces in your project and file names!
  - Create the project in your home directory on any network filesystem.
- Write a script that:
  1. Reads a text file with any kind of text.
  2. Counts every time a word is used.
  3. Displays the 5 most common words in the file.
- Try your script on the file `sample.txt` available on Moodle. You'll copy/paste in this output to your `lab01-responses.txt` file to hand in.
- Try your script with any kind of text file!
- See next slide for some hints.

Exercise hints

- Re-familiarize yourself with how to open a file and read files containing text.
- Use a dictionary to store words (words are the keys, counts are the values)
- Convert your dictionary to a list of tuples, and sort by count
  - Google “Python 3 list sorted”
- Use slicing to get the top 5 words.
- Don’t worry about commas and periods attached to your words. Leave them!

Section 3

Hand In

What To Hand In

- Hand in a file `lab01-responses.txt` file containing:
  1. The note you wrote to yourself about how to find the file you created in the filesystem exercise (Slide 17)
  2. The output from your Python exercise (Slide 19) showing the top five words from the `sample.txt` file.
- Hand in a file `lab01.py` with your Python script for the Python exercise (Slide 19) .