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# Tutorial 1: Using Your Matrix Server Account

## USING YOUR MATRIX SERVER ACCOUNT

### Main Objectives of this Practice Tutorial

- Learn how to access your **Matrix** server account (from home and/or from Seneca computer lab).
- Learn several ways to **exit** your Matrix Linux Account session.
- Understand the **Linux command structure** and how to get **help** with Linux command usage.
- Become efficient with **Linux command line editing** by using **short-cut keys**.
- Issue a **checking program** (i.e. *Shell Script*) to **confirm** that you accessed your Matrix account.
- Perform **LINUX PRACTICE QUESTIONS** for additional practice

### Tutorial Reference Material

| Course Notes / Software | Linux Command/Shortcut Reference | | YouTube Videos |
|---|---|---|---|
| **Slides:**<br>- Week 1 Lecture 1 Notes:<br>  PDF    \| PPTX<br>- Week 1 Lecture 2 Notes:<br>  PDF    \| PPTX<br>**Tutorials:**<br>- HOWTO: Access Your Matrix Account<br>**Windows SSH client Software:**<br>- SSH/SFTP<br>- Putty<br>- Bitvise SSH Client<br>- MovaXterm | **Matrix Account Access:**<br>- logout , exit<br>- \<ctrl>\<d><br>- passwd<br>**Command Line Editing:**<br>- Bash Shell Shortcut Keys | **General Linux Commands:**<br>- pwd<br>- cd<br>- ls<br>- cal<br>- date<br>- who  , w<br>- whoami ,who am i<br>- clear , \<ctrl>\<l> | **Brauer Instructional Videos:**<br>- Connecting to Matrix Using SSH Client, and Running UBUNTU Within Windows 10<br>- Linux File System, Basic Navigation (ls, cd, pwd, tree), Absolute and Relative Paths |

## KEY CONCEPTS

### Purpose of Having a Matrix Linux Server Account

While attending Seneca College, you will be using many different computer systems. Some of these servers include:

Learning Content Management System (*Link to Resources* / *Student Grades* / *Online*

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|---|---|
| **my.senecacollege.ca** | *Quizzes*) |
| **ict.senecacollege.ca** | Online access to slides, documents via webpage links |
| **wiki.cdot.senecacollege.ca** | *Student Notes* / *Tutorials* (weekly, review) / *Practice Questions* / *Resources* |
| **matrix.senecacollege.ca** | Linux Account for "*hands-on Practice*" |

Although you need to study concepts throughout this course (slides, etc.), you will also need to get **hands-on practice running Linux commands as well as performing and submitting online tutorials**.

This requires that you **connect to a Linux server** and become comfortable with **issuing Linux commands**.

In Unix/Linux, a **shell** is simply an **interface** to allow a user to communicate with the Linux computer system (server). Linux shells have evolved (improved) over a period of time. You will be using the **Bash Shell** which is considered to be *user-friendly*. By understanding how to issue Linux commands, you can create a file that contains Linux commands (called a **shell script**) later in this course to automate tasks to make you a more **productive** Linux user and system administrator.

A **shell** is an interface / interpreter to allow a user to communicate with the Linux computer system.
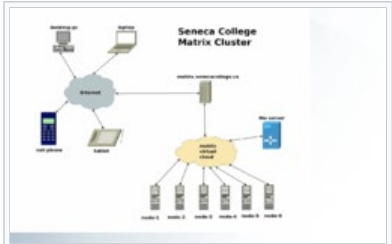
## Layout of the Matrix Linux Server

The **Matrix server** consists of **several computers connected together** to form a **cluster**.

A **Linux cluster** is a **cost effective** alternative to buying larger servers.

All registered students in this course should have an account on the Matrix server.

You will be using this account for the following reasons:

- Issuing **Linux commands**
- Becoming productive using the Linux **command prompt** (**shell**)
- Performing **Linux Tutorials** (**11 Weekly Tutorials x 2% = 22% of your final grade**)
- Performing **Linux Practice Questions**
- Performing **Review Tutorial** (**8 Sections x 1% = 8% of your final grade**)

The Matrix server consists of several Computers connected together to form a **cluster**. A **Linux Cluster** is a **cost effective** alternative to larger servers.

## Connecting to the Seneca Student VPN

Seneca College is "rolling-out" additional measures to improve **network security**. One of these measures is to implement **multi-factored authentication**. All Seneca College students are required to connect to the **Seneca Student VPN** in order to be able to connect to their **Matrix** Linux account.

*Multi-factor authentication is an electronic authentication method in which a computer user is granted access to a website or application only after successfully presenting two or more pieces of evidence (or factors) to an authentication mechanism: knowledge (something the user and only the user knows).* Reference: https://en.wikipedia.org/wiki/Multi-factor_authentication
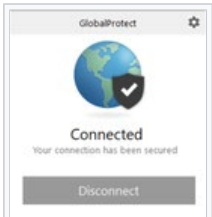
Seneca Student VPN

You should have received an email message (also available in course announcements) regarding how to setup your Smart Phone to connect and valid via the Seneca Student VPN. **NOTE:** If you haven't done this yet, please perform the steps provided in the following link:

https://students.senecacollege.ca/spaces/186/it-services/wiki/view/1025/student-vpn

In the next investigation, you will learn how to **connect** to and **login** to your Matrix server account from a remote computer such as your **home desktop computer**, **laptop** or **tablet** computer.

## Connecting to Your Matrix Account
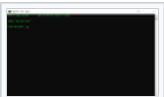
There are two basic methods to connecting to your Matrix account:

**Method 1: Run ssh Command from command prompt:**

After connecting to the **Seneca Student VPN**, you can open a **command terminal** in your **Newer Windows 10**, **Mac** or **Linux** computer and issue the following command:

**ssh senecauserid@matrix.senecacollege.ca**

Connect to Matrix via**ssh** command

**Method 2: Run graphical ssh program via MyApps in Seneca computer lab:**

If you are in a Seneca computer lab, you can use MyApps to run a **graphical SSH application** for your Windows machine. One advantage of using this method is that you are already at Seneca and are NOT required to connect to the student VPN.

**NOTE:** You instructor may show you how to run a graphic Linux VM in order to connect to your Matrix account (if interested, refer to the optional tutorial at the end of this semester).

Connect to Matrix via **graphical** SSH Program

# INVESTIGATION 1: ACCESSING YOUR MATRIX LINUX ACCOUNT

**ATTENTION**: This online tutorial will be required to be completed by **Friday in week 2 by midnight** to obtain a grade of **2%** towards this course

In this section, you will learn how to access your Matrix Linux account by two different methods:

- From your **home computer**
- From a **workstation in a Seneca College** lab via **MyApps**

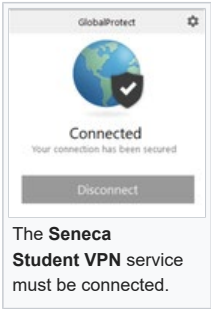## METHOD 1: CONNECTING TO YOUR MATRIX ACCOUNT FROM YOUR HOME COMPUTER

You will now learn a quick and simple method of connecting to your Matrix account by opening a text-based **terminal** (in any OS) and issuing the **ssh command**.

**Perform the Following Steps:**

1. If you want to connect to your Matrix account from home, you MUST first connect to the Seneca Student VPN.
   Make certain that your **Seneca Student VPN is connected**.

   **NOTE:** If you haven't set this up, refer to the following link for instructions;
   https://students.senecacollege.ca/spaces/186/it-services/wiki/view/1025/student-vpn

   You only have to connect to your Seneca student VPN once during the day,
   or while you are logged into your computer.

2. Determine which **operating system** that your computer is using.

3. Try connecting to your Matrix account using the instructions in the **table** below based on your **current operating system**.

The **Seneca Student VPN** service must be connected.

| Newer Version of Windows 10: | MacOSX: | Linux: |
|---|---|---|
| <ul><li>From the start menu, type **cmd** and launch program</li><li>In the command terminal, enter the following command:<br>**ssh senecausername@matrix.senecacollege.ca**</li></ul> | <ul><li>Click *Launchpad* icon, type **terminal** and press **ENTER**</li><li>In the terminal, enter the following command:<br>**ssh senecausername@matrix.senecacollege.ca**</li></ul> | <ul><li>From the menu, choose: **Applications** > **System Tools** > **Terminal**</li><li>In the terminal, enter the following command:<br>**ssh senecausername@matrix.senecacollege.ca**</li></ul> |

4. When connecting securely for the **first time**, a **dialog box** will appear to share a "**public key**" with your Matrix account in order to make your interaction between your workstation and the remote Linux server secure within the network (i.e. encrypted to prevent unauthorized access by other users)

   *FYI: To make communications over a network **secure**, a computer generates **two keys**: a **private key** that is kept on the computer, and a **public key**, which can be shared with other computers. Transmissions from your computer uses the private key to encrypt (**scramble**) transmission to the remote computer, which in turn, uses the public key to decrypt (unscramble) the transmission. Likewise, the remote computer uses the public key to encrypt (scramble) transmissions and your computer uses the private key to decrypt (**unscramble**) those transmissions.*

5. Type **yes** and press **ENTER** to share your public key.

   Next, a **dialog box** will appear prompting you for your Matrix account **password** in order to gain entry to your Matrix account.
   Your Matrix password is <u>identical</u> to your Seneca password.

   **NOTE:** As you type the password, the text may be **hidden** to prevent others from viewing your password

6. Enter your Seneca password and press **ENTER**

   **NOTE:** If you encounter an **error message**, this can occur for several reasons:
   1. You mis-spelled the **name of the server**
   2. You mis-spelled your Matrix **username** (same username that you connect to *my.senecacollege.ca*)
   3. You have **CAPS LOCK** on by mistake (your username should be **lowercase** only).
   4. You mis-spelled your **password** (same password that you connect to *my.senecacollege.ca*)

      If you continue to experience the same problems, click on the following link for IT service desk contact info: **IT service desk** .

7. If you entered your password correctly, the **Matrix Linux shell** should appear where you can enter Linux commands.

   The **Matrix** server has been configured to allow users to **only interact with the Linux OS by issuing commands**. The main reason for this is to **force students to learn how to issue Linux commands**.

8. To **exit** your Matrix session, type the command **exit** followed by **ENTER**

   **NOTE:** You should notice that you are returned to the original command prompt where you issued the *ssh* command.

9. Type the same command at the **command terminal prompt**: **exit** followed by **ENTER**

   **NOTE:** You should notice that the you are disconnected and that the original terminal window has **automatically closed**.

10. Try accessing your Matrix account, and then exiting your Matrix account several times to become familiar with this process.

    You will now learn an **alternative method** to access your Matrix account (if you have an MS Windows machine) by downloading and running a graphical SSH application.

## METHOD 2: CONNECTING TO YOUR MATRIX ACCOUNT FROM SENECA COMPUTER LAB

**NOTE: This section requires you have access to a Seneca computer lab on campus.**
**If you don't have access to a Seneca computer lab this semester, then you can skip this section**
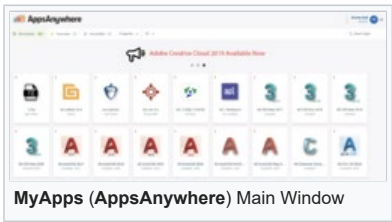
You can also connect to your Matrix server account in the **Seneca Computer lab via MyApps**.

One advantage of this method is that your are at the college; therefore, **you do NOT have to worry about connecting to the Seneca VPN**. Another advantage of using this method is to introduce you to a **graphical program** to allow you connect to your Matrix account as opposed to using the **ssh** command (shown in the previous section).

This method would also be useful if you do **not** have a home (notebook) computer and have access to a Seneca computer lab workstation.

**MyApps** (**AppsAnywhere**) is an application streaming service that lets you install software on any Seneca PC on demand. Any software application on the MyApps menu can be used on computers in classrooms, labs, and the Computing Commons.



**MyApps** (**AppsAnywhere**) Main Window

Reference: https://inside.senecacollege.ca/its/software/myapps/

You will now use **MyApps** on your Windows workstation in your Seneca lab room to launch an application to allow you to connect and login to your Matrix server account.

**Perform the Following Steps:**



Several SSH applications will appear. We will use the application called **SSH Client** for this practice tutorial.

1. Start your workstation in your lab and login to your Seneca Windows account.

2. Make certain that the **MyApps** window is open. This window should have opened shortly after you logged into your Windows workstation. If the application windows is not open, click on the **MyApps** icon on the desktop to launch).

   **NOTE: You may be required to validate in order to use MyApps correctly. If you see near the top of the screen "requires validation", then click on that area to connect to validate.**

3. Click on the **Search Apps** area located in the top right corner of the MyApps window and type the word: **ssh**



SSH Client Application Window

4. Several SSH applications will appear.

   **NOTE:** All of these applications allow you to connect to your Matrix account. We will use the application called **SSH Secure Shell Client** for this practice tutorial.

5. Launch the **SSH Secure Shell Client** application icon to launch this program.

   **NOTE:** Prior to launching the application, you can add this to your **favourites** which will make it faster to access this application in the future.



Quick Connect Dialog Box

6. The main SSH Client window will appear. Click on the **Quick Connect** button.

   **NOTE:** The Connect dialog box allows the user to specify the **server name** and your **account name** to allow you to connect to the server.

7. Click on the textbox labelled Hostnanme and enter the text: **matrix**

   **NOTE:** You can use the hostname **matrix** since you are located <u>inside</u> Seneca's network. If you where located <u>outside</u> Seneca's network, then you would need to enter the full domain name: **matrix.senecac.on.ca**

8. When connecting securely for the **first time**, a dialog box will appear to share a "public key" with your Matrix account in order to make your interaction between your workstation and the remote Linux server secure within the network (i.e. encrypted to prevent unauthorized access by other users)



Dialog Box to Share Public Key on Remote Server

   **FYI:** To make communications over a network secure, a computer generates **two keys**: a **private key** that is kept on the computer, and a **public key**, which can be shared with other computers. Transmissions from your computer uses the private key to encrypt (scramble) transmission to the remote computer, which in turn, uses the public key to decrypt (unscramble) the transmission. Likewise, the remote computer uses the public key to encrypt (scramble) transmissions and your computer uses the private key to decrypt (unscramble) those transmissions.

9. Click the **Yes** button to share your public key.



Password Dialog Box

10. Next, a dialog box will appear prompting you for your Matrix account password in order to gain entry to your Matrix account. Your Matrix password is identical to your Seneca password. As you type the password, the text will be blocked-out or hidden to prevent others from viewing the screen to obtain your password

11. Enter your password and click **OK** or press **ENTER**



Authentication Response Dialog Box

12. Click **OK** or press **ENTER** at the **Authentication Response** dialog box.
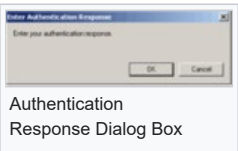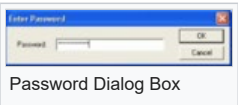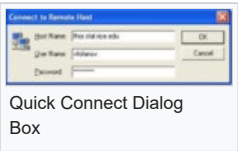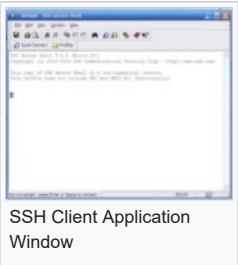
**NOTE:** If you encounter an **error message**, this can occur for several reasons:

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2. You mis-spelled your Matrix **username** (same username that you connect to my.senecacollege.ca)
3. You have **CAPS LOCK** on by mistake (your username should be **lowercase** only).
4. You mis-spelled your **password** (same password that you connect to my.senecacollege.ca)

SSH Login Error
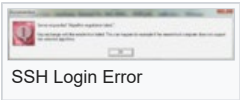
If you continue to experience the same problems, click on the following link for IT service desk contact info: **IT service desk** .

13. If you entered your password correctly, the main SSH Linux shell should appear where you enter Linux commands.

The **Matrix** server has been configured to allow users to **only interact with the Linux OS by issuing commands**. There are various reasons for this, but the main 2 reasons are to **force students to learn how to issue Linux commands** as well as **limitations to remote access to a graphical Linux server** due to large number of users (students).

Matrix Shell Command Line Interface

You can **configure** the SSH application to adjust elements such as the **window size** and **text font type** and text **font size**. We will be showing you how to configure your SSH Secure Shell Client, but the other applications can allow you to configure their settings.

SSH Settings Dialog Box

**Perform the Following Steps:**

1. Click on the **Edit** menu item, and then select **Settings** in the Edit drop-down menu.

2. To change the size of your shell window, under the *Global Settings* section, click **Appearance**

3. Change the *window size* both horizontal and vertical to larger values.

4. To change the font size, under the *Global Settings* section, click **Font**

5. Select a larger *font size* and click **OK**

6. You now should notice that you have customized your SSH shell terminal. You can use the settings screen to also change your background and text colours if you are interested in doing so.

7. To exit your Matrix session, type the following command and press ENTER: **exit**

   **NOTE:** You should notice that the colour of the text changes slightly when disconnected and you are unable to issue Linux commands from that window.

8. After you have disconnected from your account, close the SSH Secure Shell Client application window.

9. It is recommended to repeat these steps with connecting to your Matrix account from a Seneca lab workstation until you become comfortable with the process.

In the next investigation, you will learn how to issue Linux commands from the command prompt (referred to as the "shell"), learn how to get help with Linux commands, use command-line editing short cut keys, and run a program to confirm that you connected to your Matrix account in order to get marks for this online tutorial.

# INVESTIGATION 2: USING THE LINUX SHELL

In this investigation, you will learn how to use the Linux Shell. Topics in the section include:

- Learn the basic **Linux command structure** (*arguments* and *options*)
- Learn how to get **help** for Linux commands via the **online manual** (i.e. **man** command).

Perform **Basic Shell Editing**
- Issue a **program** to confirm that you connected to your Matrix account

The Bash shell in Matrix allows you to interact with your Matrix account by issuing commands.

**The General Linux Command Structure is as follows:**

```
command argument1 argument2 ...
```

Some Linux commands can be issued by entering the Linux command line without arguments (e.g. **pwd**, **date**, **ls**, **cal**), but many Linux commands can be issued with arguments (e.g. **cal 2002**, **cd /bin**, **ls -l -a /bin** ).

**What Does an Argument Represent?**

An **argument** can respresent:

- a **file pathname**
- a command **option**
- a series of characters (i.e. **text**) that the command can use

An **argument** is <u>separated</u> from a command (or from other arguments) by a **SPACE**, **MULTIPLE SPACES** or a **TAB**.

**Perform the Following Steps:**

1. Make certain that you are logged into your Matrix account.

2. Issue the following Linux command: `pwd`

   The output from this Linux command basically shows your **current location** in the Matrix server.
   This represents a **directory pathname** to your home directory. We will discuss *pathnames* later in this course.

3. Issue the following Linux command: `ls`

   What do you notice?

   If there were any files in your home directory, just their file names would be displayed.

4. Issue the following Linux command: `cd /bin`

5. Issue the following Linux command to confirm your current location: `pwd`

6. Issue the following Linux command: `ls`

   What do you notice?

7. Issue the following Linux command using an **option**: `ls -l`

   What do you notice?

   The **-l** option with the **ls** command provides a **detailed** ("*long*") listing of files providing more information on a separate line for each file.

8. Issue the following Linux command to return to your home directory: `cd`

9. Issue the following Linux command to confirm your current location: `pwd`

10. Issue the following Linux command: `ls /bin`

11. Issue the following Linux command to confirm your current location: `pwd`

    What do you notice?

    What makes this command with that argument useful if you are current located in your home directory?

12. Issue a Linux command that you have already learned to change to your **home** directory
    and to **confirm** that you have returned to your home directory.

13. Issue the following Linux command: **`clear`**

    What do you notice? How would this command be helpful?
    **FYI:** The short-cut keys to clear the screen for the Bash shell is: `ctrl-l`

14. Issue the following Linux command: **`who`**

    What information does this command show?

    This command lists users that are logged into the same Matrix server as yourself.
    **NOTE:** Remember that the Matrix Linux cluster contains several servers, so it does not display
    all users that are logged onto those other machines within that cluster!

15. Issue the following Linux command: **whoami**

    What does this command display? What do you think is the purpose of this command?

16. Issue the following Linux command: **`cal`**

    What is the purpose of this command?

17. Issue the following Linux command: **`cal 2021`**

    What is the purpose of this command using this argument?

18. Issue the following Linux command: **`cal 2 2021`**

    What is the purpose of this command using those two **numbers** as arguments?

**Getting Help with Linux Commands**

With the Linux OS containing over **2500** commands and utilities, it is good for a Linux user or
Linux system administrator (sysadmin) to learn about how to use commands "on-the-fly".

The **man** command can provide information on how to use a command
(i.e. **command usage**, **acceptable command arguments**, **command options**, **examples**).

1. Issue the following command: **`man man`**

   You may notice that the online manual categories commands into sections or **numbered volumes**.

2. Type the **SPACE** key to move to the next screen.

   How many **volume numbers** are contained in the man pages (like **executable commands**,
   **games**, or **system administrator commands**)?

   **TIP:** You can use the following **short-cut keys** within the man command to
   help navigate throughout this utility to get help with the ls command (refer to table below):

   | Keyboard Shortcut | Purpose |
   | --- | --- |
   | **ENTER** | Move down one line |
   | **SPACEBAR** | Move one screen down |
   | **<ctrl><b>** | Move one screen up |
   | **/pattern/** | Search for Pattern |
   | **q** | quit man utility |

3. Press the letter **q** to exit the man command.

4. Issue the following Linux command to get help with the ls command: **`man ls`**

5. Navigate through the man utility for the **ls** Linux command and note the **option letters** that correspond to the following descriptions:
   - "**use a long listing format**"
   - "**do not ignore entries starting with .**" (i.e. hidden files)
   - "**sort by file size**"
   - "**append indicator (one of */=>&|) to entries**" (i.e. type of file)

6. Exit the man utility for the *ls* command.

7. Issue the **ls** command for <u>each</u> of those option letters you noted in **step 5** to see how this command differs for each option.

   **NOTE:** The **man** utility can be used with the **-k** option to help list Linux commands that match a text pattern that is contained within the help screen for a Linux command.

8. **Pipeline commands** can be used to filter-out unnecessary output. In the next command that you will be issuing, the output from the **man -k** command, is sent into the **grep** command to *filter* (i.e. *trap*) only output that matches the pattern "8"
   (The number "8" refers to the category of type of command - in this case, administration commands).

   We will learn more about pipeline commands later in this course.

9. Issue the following Linux pipeline command: `man -k user | grep 8`

   How does this *pipeline command* make it easier to obtain information regarding man command?

10. If you wish to change your password, you can change it by issuing the command: `passwd`
    What option for the passwd command can be used to change user info (such as name)?
    **Hint:** use the **man** command for **passwd**.

    **NOTE:** Do **NOT** run the *passwd* command. Unique for this college, your Matrix password is changed automatically when you change your **myseneca** password.

11. Press the letter `q` to exit the man command.

    You will now learn how to perform **command line editing**
    to correct syntax errors while typing Linux commands PRIOR to pressing the ENTER key.

**Command Line Editing**

Learning **shortcut keys** in any OS terminal will allow you to be more productive as a *Linux user* or *Linux System Administrator* (commonly referred to as: **Linux sysadmin**).

| Shortcut Key(s) | Purpose |
|---|---|
| <ctrl><l> | Clear Screen |
| <ctrl><u> | Clear Command Line |
| <Up Arrow> , <Down Arrow> | Scroll Up / Down Command History |
| <backspace> ,<ctrl><backspace> ,<ctrl><h> | Delete character before the cursor |
| <ctrl><w> | Delete word before the cursor |
| <ctrl><a> | Move cursor to beginning of command line |
| <ctrl><e> | Move cursor to end of command line |
| <alt>f/<alt>b   (Mac: OPTION+Right/Left-Arrow) | Move Forward/Backward one word |

Command Line Editing Shortcut Keys.

Let's learn a few common Bash Shell keyboard shortcut keys and find out where you can access online help for additional shortcuts (if required).
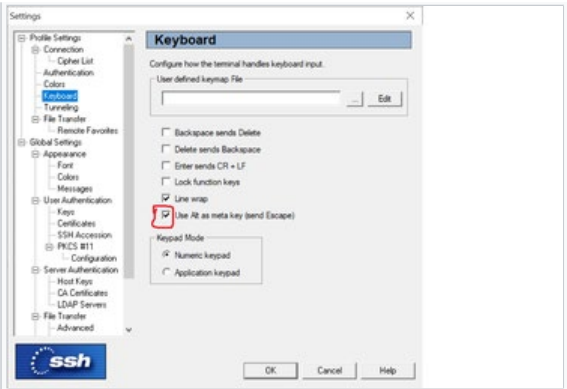
**Perform the Following Steps:**

1. Type the following Linux command, but DON'T press the *ENTER* key:
   `cd /bin`

2. Press the `ctrl-a` key combination. What happens?

To make **alt-f** key work, select **Edit** -> **Settings** -> **Keyboard**, and select the checkbox **Use ALT as meta key (and Escape)**.

**NOTE:** To make **alt-f** key work when use the **GRAPHICAL Windows SSH Client application**, select **Edit** -> **Settings** -> **Keyboard**, and select the checkbox **Use ALT as Meta key (and Escape)**.

3. Press the `alt-f` key combination **two times** (OPTION+right-arrow for Mac OSx).

4. Press the `alt-b` key combination **one time**. (OPTION+left-arrow for Mac OSx).

5. Press the `ctrl-w` shortcut key. What happens?

6. Type the following command: `ls`

7. Press the `ctrl-e` key combination

   What happens?



**alt-b** moves one word backwards for Windows OS



**ctrl-w** deletes a word to left of the cursor.



After command is deleted, then type new command and press **ctrl-e** to move to end of the command line.

8. Press the `ENTER` key to execute the command.

9. Press the `up arrow` key. What happens?

10. Press the `ctrl-u` key combination. What happens?

11. Press the `up arrow` key combination, and see what happens when you press `BACKSPACE` , `<ctrl> <BACKSPACE>` and `<ctrl><h>`.
    Why is it important to know those series of key combinations?

12. Press the `ctrl-u` key combination to clear the line.

13. Press the `ctrl-l` key combination. What happens? What is the advantage of using **ctrl-u** as opposed to **ctrl-l**?

    The Bash shortcut keys that you just learned are sufficient to perform Bash Shell editing.
    Although you are NOT required to learn other short-cut keys, here is a link to a listing in case you are interested:
    [https:// ostechnix.com/list-useful-bash-keyboard-shortcuts/ Useful Bash Shell Keyboard Shortcuts]

**Running a Shell Script to Check Student Online Tutorial Participation**

Professors will require students successfully perform these online tutorials for marks (within a deadline).
In order to confirm that you successfully performed a tutorial, you will be required to run a program
(or in later tutorials, several programs) to prove that you successfully completed tasks in a tutorial and get marks.

These programs (known as Shell Scripts) will check your work and offer feedback if you made mistakes, so you can make corrections.
Making corrections (i.e. troubleshooting) and re-running these checking programs until you are successful will help students
gain "hands-on" experience as well as "trouble-shooting experience.
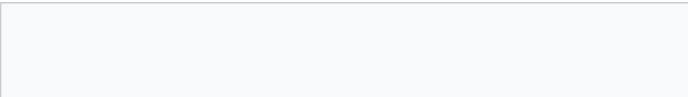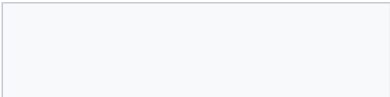
CHECKING YOUR WORK:

Checking "uli101/notes" directory has been removed in your home directory: OK
Checking "uli101/tutorials" directory has been removed in your home directory: OK
Checking "uli101/examples" directory has been removed in your home directory: OK
Checking "xyz100" directory has been removed in your home directory: OK
Checking "xyz101" directory has been removed in your home directory: OK
Checking "xyz100/uli101/notes" directory has been removed in your home directory: OK
Checking "xyz100/uli101/examples" directory has been removed in your home directory: OK
Checking "xyz100/uli101/tutorials/aug100" directory has been removed in your home directory: OK

Congratulations!

You have passed the week1-check-3 script
This means that your directory structure has been correctly removed :)

You can proceed to the next section.

If all all check pass, then user performed can proceed.

CHECKING YOUR WORK:

Checking "uli101/notes" directory has been removed in your home directory: OK
Checking "uli101/tutorials" directory has been removed in your home directory: OK
Checking "uli101/examples" directory has been removed in your home directory: OK
Checking "xyz100" directory has been removed in your home directory: WARNING

The directory pathname "/home/murray.saul/xyz100" still exists. Check if you misspelled directory name, or used uppercase letters by mistake. Create the directory "xyz100" in your home directory and re-run this checking script

If there is a warning, then feedback is provided to user to correct and re-run checking script.

If you have correctly completed the required tasks, the user can proceed. If the checking shell script detects an **error**, then it will provide feedback to allow the student to fix that problem so they can re-run the checking shell scripts until they have successfully completed a task.

**Perform the Following Steps:**

1. Make certain that your current directory is **your home directory**
   By entering the following Linux command:
   **cd**

2. Issue the following command to run a checking script :
   **~uli101/week1-check**

   The beginning character "**~**" is called **tilde**. You get this character by pressing **SHIFT** + `
   (which is the key to the left of the number 1 on your keyboard).

3. Your screen should clear and indicate that you have proved that you have successfully logged in.

4. An email will be sent to your Seneca email as **confirmation** in case your ULI101 professor is assigning marks to these tutorials.

   Keep those confirmation email messages for the duration of this semester as proof that you have completed those checking scripts in case there is a discrepancy in tutorial grades.

## LINUX PRACTICE QUESTIONS

The purpose of this section is to obtain **extra practice** to help with **quizzes**, your **midterm**, and your **final exam**.

Here is a link to the MS Word Document of ALL of the questions displayed below but with extra room to answer on the document to simulate a quiz:

https://github.com/ULI101/labs/raw/main/uli101_week1_practice.docx

Your instructor may take-up these questions during class. It is up to the student to attend classes in order to obtain the answers to the following questions. Your instructor will NOT provide these answers in any other form (eg. e-mail, etc).

**Review Questions:**

1. What is a "**Linux Cluster**"? What is an advantage of using a Linux cluster?
2. List **three unique server names** at Seneca college and briefly explain the purpose of that server.
3. List the steps to connect and login to your Matrix Seneca College account on your **laptop** or your **home computer**.
4. List alternative methods to connect to your Matrix account, including if you have an **Apple Mac** computer or are running the **Linux** operating system.
5. List 3 unique ways to **log-out** of your Matrix account (not including closing the SSH window or application).
6. What is the difference between a Linux **command** and an **argument**?
7. What is the purpose of a Linux command **option**?
8. What character(s) are used to **separate** commands and arguments?
9. Create a **table** listing each Linux command, useful options that were mentioned in this tutorial for the following Linux commands:
   **pwd** , **cd** , **ls** , **cal** , **date** , **who** , **w** , **whoami** , **who am I** , **clear**

Author: Murray Saul

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This page was last edited on 12 September 2022, at 10:24.

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