

Engineering 14100

Linux 1 ACT: Introduction to LINUX and Computer Tools

Task 1 (of 3)

Objective: Describe the Linux directory structure and perform several basic navigation commands.

Initial Keyboard Operator: Person with the oldest computer

Remember:

1. You should be working as a team; ALL team members will be held responsible for all material.
2. You should all be working on this Task using one (1) computer, unless otherwise directed.

Background: Linux is descended from UNIX, which is an operating system (OS) that has a key role in the history of computers and computer science. As an operating system, it provides users with a powerful method for accessing and controlling the hardware of a computer and all the devices connected to it. Programmers developed a series of short commands to improve the efficiency of keystrokes to make requests of a computer system. The OS is at the heart of many technologies such as telecommunications, informatics, the internet, and research.

Part A: One of the fundamental operations of an Operating System is the creation and organization of files into directories (or folders used in Windows OS). Engineers will often have large sets of data files collected during experiments that they will need to process as part of their analysis and storage. With Linux you will be able to gather and move a large mass of data with a few keystrokes. This activity highlights some the basics for managing files.

The `man` command is useful for finding out some basic information about various other commands. It is analogous to today's help files that appear with most Windows programs.

Working and discussing as a team: Use the `man` command to look up help information for the commands listed below. Write a definition for and a practical example of the use of each command.

<code>mkdir</code>	<code>mv</code>
<code>rmdir</code>	<code>cp</code>
<code>cd</code>	<code>rm</code>
<code>pwd</code>	<code>ls</code>

Save your answers in a PDF file: `Linux1_ACT_login.pdf`

Using the above commands, perform the following operations:

1. From the home directory, navigate to the `My Documents` folder.
2. In the “`My Documents`” folder, create a directory called `ENGR141`.
3. Inside the `ENGR141` directory, create directories called `Week02` and `Waynes_World`.
4. Navigate back to the “`My Documents`” directory.
5. Each team member should suggest a directory to create such as `CHEM115` or `MA161` based on that team-member’s course schedule.

NOTE: Adding spaces in your directory (or file) names in Linux may cause later when trying to reference that directory. Therefore, a common practice is to remove spaces and replace with underscore “`_`”.

Part B:

As a TEAM, answer the following questions. Note that there are *many* correct and acceptable solutions to each of these questions.

1. Adding quotes [“...”] around a file name with spaces is one way to reference a name with spaces. Describe what happens if you ‘forget’ to use these quotes in a file name with spaces.
2. How would you remove a directory that still contains files?
3. Describe the difference between “`cd`”, “`cd ..`”, “`cd .`”, “`cd ~`” and “`cd /`”.

Save your answers in a PDF file: `Linux1_ACT_login.pdf`

Task 2 (of 3)

Objective: To learn about LINUX permission settings, octal notation, PICO and NotePad++.

Initial Keyboard Operator: Person with the brightest colored shirt

Part A: Files contain valuable information that can be quite expensive. For example, NASA and earthquake engineers generate massive amounts of data during expensive research and development studies. If the files were not protected, then it might be possible for someone to accidentally change values making the information corrupt. Therefore the OS needs a way to protect the files by defining access permissions.

`chmod` (**change mode**) is used to set file permissions for specific users or groups.

As a TEAM, complete the following:

- 1) Navigate to the `Waynes_World` directory.
- 2) Enter the following command:
`pico My_Lost_Homework`
- 3) Within the `pico` editor, type:
`#I like to hide in this magical realm.`
- 4) Save the file with “`^+O`” (Ctrl + O), then exit the editor by “`^X`” (Ctrl + X)
- 5) Navigate to the `ENGR141` directory.
- 6) Enter the following command:
`chmod 000 Waynes_World/`
- 7) Try to remove `Waynes_World` from your `ENGR141` directory.
- 8) Describe what happens.

Save your answers in a PDF file: `Linux1_ACT_login.pdf`

Part B, as a TEAM, complete the following:

- 1) Navigate to the `ENGR141` directory.
- 2) Enter the following command:
`ls -la`

You will see a more detailed list of files in your directory with a prefix. (e.g. “`drwxr-xr-x`”)

NOTE: The prefix to `Waynes_World` is “`d-----`”. This prefix denotes the current state of permission assignment written in octal notation.

- 1) Change the 3-digit parameter.
(Try: `chmod 321 Waynes_World/`)
- 2) Describe what these changes do to the prefix.
- 3) Remove `Waynes_World` and all of its contents

Save your answers in a PDF file: `Linux1_ACT_login.pdf`

Part C: At the top of **every** Python script that you create in the future, you **need** to include the appropriate header at the risk of otherwise not having your assignment graded. Every team member should have a copy of both their individual and team headers and these should be pre-filled with the appropriate information (e.g. actual team members' names, etc).

1) Navigate to Week02.

2) Using Notepad++, create header text files by filling in the example headers below:

Individual Header (ind_header.txt):

```
# Activity1_2_3 : My Awesome Program Title
# File : FooBar.py
# By : Neil Armstrong
# Login : arms1930
# Section : section number
# Team : Team 49
```

```
# _____
# ELECTRONIC SIGNATURE
# Neil Alden Armstrong
#
# The electronic signature above indicates the program submitted for
# evaluation is my individual work, and I have a general
# understanding of all aspects of its development and execution.
#
# PROGRAM DESCRIPTION
# My program does super cool things
```

The # symbol in the beginning of every line indicates a comment line.

Team Header: (team_header.txt):

```
# Activity4_5_6 : A more appropriate title
# File : filename.py
# By : First Full Name
# Login : your_login
# By : Second Full Name
# Login : other_persons_login
# By : Third Full Name
# Login : yet_another
# By : Fourth Full Name
# Login : last_one
# Section: section number
# Team : Team ##
#
```

```
# ELECTRONIC SIGNATURE
# First Full Name
# Second Full Name
# Third Full Name
# Fourth Full Name
#
# The electronic signatures above indicates the program submitted for
# evaluation represents the work of all team members and that all
# team members have a general understanding of the program.
#
# PROGRAM DESCRIPTION
# Our program saves the world
```

When you have finished, examine these files on your Career Account Drive and in Linux to confirm that you can navigate to them successfully from either environment.

Task 3 (of 3)

Objective: To use `man` to learn about some other useful Linux commands.

Initial Keyboard Operator: Person who lives on the lowest level of Shreve

Part A: Linux has a wide range of other commands to perform other operations associated with managing a system. As was presented in the pre-activity, the `man` command is useful for finding out some basic information about various commands. Use the `man` command to look up information on the following commands. Record a short definition for each command and what operation the command performs.

Save your file as: `Linux1_ACT_login.pdf`

```
alias  
finger  
less  
lp  
more  
ps  
rm  
ssh  
unalias  
which  
who
```

Part B:

Select three of the commands introduced in above and use them in a practical situation relating to your files. Take a screen shot of the code and the results, and include it in your PDF.

Save your answers in a PDF file: `Linux1_ACT_login.pdf`

Bonus Activity Submissions

Instructions: Complete and submit **ALL** Task materials associated with this Activity (see 'Submit Files' below). You are allowed to combine the work you and your team completed during the Activity with materials you individually (or as a team) complete outside of class. The Bonus Activity Submission will not be graded and returned to you like a typical assignment. Instead, it will be reviewed, and the bonus point awarded, for its completeness, i.e., for completing ALL the Tasks associated with the Activity. Submitting an incomplete Bonus Activity (something less than all of the Tasks) will be considered an act of **Academic Dishonesty** for which the penalty will be forfeiture of the opportunity to earn future Bonus Activity Submission points.

There are two options for completing the materials for the Bonus Activity Submission:

As an Individual: Combine the work you and your team completed in class with materials you have individually completed outside of class. When submitting an individual Bonus Activity Submission you will append your electronic signature (i.e., your typed name) at the top of the file that represents your individual work. Your electronic signature indicates that this is your individual work and you have not collaborated with other individuals (other than the teaching team) to obtain the final materials being submitted – working with other individuals/groups (e.g., discussing ideas and concepts, helping find errors, talking about potential solutions to errors) is permissible up to the point where the work represents a coloration (i.e., working with another person or group to achieve an answer). Any work previously completed by your team should include each team member's electronic signature. The significance of an electronic signature by an individual for team work is stated below.

As a Team or Ad Hoc Group: Combine the work you and your team completed in class with materials your team (or ad hoc group) completed outside of class (**For the Bonus Activity Submission ONLY:** you are allowed to work with any other members of the class to complete the assignment). However, you should exercise care when appending your electronic signature to ensure you are in full compliance). When submitting a Bonus Activity that has been worked on as a team (or ad hoc group) each person will append his/her electronic signature (i.e., his/her typed name) at the top of the file that represents the collaborative work. The electronic signature of each individual implies he/she: was an active participant in the preparation of the materials; and has a general understanding of **ALL** the materials being submitted. Even for work submitted as a team, each individual who wishes to receive credit must submit the team's file (with all appropriate signatures) to their own individual assignment drop box.

Submit Files: Submit *all* files electronically via Blackboard to the appropriate box on time.

- F1. `Linux1_ACT_login.pdf`
- F2. `ind_header.txt`
- F3. `team_header.txt`