



## IBM Course: Hands-on Introduction to Linux Commands and Shell Scripting

### Introduction to Linux

| Command                 | Syntax   | Description                           | Example  |
|-------------------------|--|---------------------------------------|--|
| List                    | <code>ls [OPTIONS]</code><br><code>[FILE/DIRECTORY]</code> | List files and directories at path    | <code>ls</code><br><code>/home/user/documents</code> |
| Print Working Directory | <code>pwd</code>   | Print present working directory       | <code>pwd</code>                                     |
| Change Directory        | <code>cd [DIRECTORY]</code>                                | Change current directory              | <code>cd</code><br><code>/home/user/documents</code> |
| Super user do           | <code>sudo [COMMAND]</code>                                | Run command with superuser privileges | <code>sudo apt update</code>                         |
| Text Editor             | <code>nano [FILE]</code>                                   | Open file with Nano text editor       | <code>nano myfile.txt</code>                         |

### Introduction to Linux Commands

# Informational, Navigational, & Management Commands

| Command            | Syntax                                  | Description                                  | Example                                    |
|--------------------|---|--|--|
| Who Am I           | <code>whoami</code>                     | Return username                              | <code>whoami</code>                        |
| User ID            | <code>id</code>                         | Return current user or group ID              | <code>id</code>                            |
| System Information | <code>uname [OPTIONS]</code>            | Display system information                   | <code>uname -a</code>                      |
| Manual Pages       | <code>man [COMMAND]</code>              | Display manual page for a command            | <code>man ls</code>                        |
| Curl               | <code>curl [OPTIONS] [URL]</code>       | Transfer data from or to server              | <code>curl https://some_website.com</code> |
| Date               | <code>date [OPTIONS]</code>             | Display current date and time                | <code>date</code>                          |
| Find               | <code>find [DIRECTORY] [OPTIONS]</code> | Find files and directories at specified path | <code>find /home/user -name '*.txt'</code> |
| Make Directory     | <code>mkdir [DIRECTORY]</code>          | Create new directory                         | <code>mkdir myfolder</code>                |

| Command            | Syntax   | Description  | Example   |
|--------------------|--|--|---|
| Remove Directory   | <code>rmdir</code><br><code>[DIRECTORY]</code>                                   | Remove empty directory                               | <code>rmdir myfolder</code>                                     |
| Process Status     | <code>ps [OPTIONS]</code>  | Display process status information                   | <code>ps -ef</code>   |
| Table of Processes | <code>top</code>   | Display live system resource usage                   | <code>top</code>  |
| Disk Usage         | <code>df [OPTIONS]</code><br><code>[FILESYSTEM]</code>                           | Display disk space usage                             | <code>df -h</code>  |
| Create Empty File  | <code>touch [FILE]</code>  | Create new file or update timestamp                  | <code>touch myfile.txt</code>                                   |
| Copy               | <code>cp [OPTIONS]</code><br><code>[SOURCE]</code><br><code>[DESTINATION]</code> | Copy files or directories from source to destination | <code>cp myfile.txt</code><br><code>/home/user/documents</code> |
| Move               | <code>mv [OPTIONS]</code><br><code>[SOURCE]</code><br><code>[DESTINATION]</code> | Move or rename files and directories                 | <code>mv myfile.txt</code><br><code>/home/user/documents</code> |
| Remove             | <code>rm [OPTIONS]</code><br><code>[FILE/DIRECTORY]</code><br><code>]</code>     | Remove files   | <code>rm my_scratch_file.txt</code>                             |

| Command     | Syntax   | Description                          | Example   |
|-------------|--|--------------------------------------|---|
|             |  | Remove nonempty directory            | <code>rm -r</code><br><code>path_to_temp_directory</code> |
|             | <code>rmdir [OPTIONS]</code><br><code>[DIRECTORY]</code>   | Remove empty directory               | <code>rmdir</code><br><code>path_to_my_directory</code>   |
| Change Mode | <code>chmod [OPTIONS]</code><br><code>[MODE] [FILE]</code> | Change file or directory permissions | <code>chmod u+x myfile.txt</code>                         |

## Working with Text Files, Networking & Archiving Commands

| Command     | Syntax   | Description  | Example                         |
|-------------|--|--|---------------------------------|
| Concatenate | <code>cat</code><br><code>[FILE]</code>                              | Display the contents of a file                     | <code>cat myfile.txt</code>     |
|             |  | Concatenate and display contents of multiple files | <code>cat file1 file2</code>    |
| More        | <code>more</code><br><code>[FILE]</code>                             | Display file one screen at a time                  | <code>more myfile.txt</code>    |
| Head        | <code>head</code><br><code>[OPTIONS]</code><br><code>] [FILE]</code> | Display first N lines of file                      | <code>head -5 myfile.txt</code> |
| Tail        | <code>tail</code><br><code>[OPTIONS]</code><br><code>] [FILE]</code> | Display last N lines of file                       | <code>tail -5 myfile.txt</code> |

| Command    | Syntax   | Description  | Example                                |
|------------|--|--|--|
| Echo       | <code>echo</code><br><code>[ARGUMENTS]</code>  | Display arguments in console                               | <code>echo Hello, World!</code>        |
| Sort       | <code>sort</code><br><code>[OPTIONS]</code><br><code>] [FILE]</code>   | Alphanumerically sort file contents                        | <code>sort file.txt</code>             |
| Unique     | <code>uniq</code><br><code>[OPTIONS]</code><br><code>] [FILE]</code>   | Report or remove consecutively repeated lines in file      | <code>uniq file.txt</code>             |
| Word Count | <code>wc</code><br><code>[OPTIONS]</code><br><code>] [FILE]</code>   | Print the number of lines, words, and characters in a file | <code>wc file.txt</code>               |
| Grep       | <code>grep</code><br><code>[OPTIONS]</code><br><code>]</code><br><code>PATTERN</code><br><code>[FILE]</code>   | Search for a specified pattern in a file                   | <code>grep "hello" file.txt</code>     |
| Paste      | <code>paste</code><br><code>[OPTIONS]</code><br><code>]</code><br><code>[FILE1]</code><br><code>[FILE2]</code> | Merge lines of files side by side                          | <code>paste file1.txt file2.txt</code> |
| Cut        | <code>cut</code><br><code>[OPTIONS]</code><br><code>] [FILE]</code>  | Remove sections from each line of a file                   | <code>cut -d":" -f1 /etc/passwd</code> |

| Command  | Syntax                                 | Description  | Example  |
|----------|--|--|--|
| Tar      | <pre>tar [OPTIONS] [FILE]</pre>        | Archive files together into a single file                        | <pre>tar -czvf archive.tar.gz /directory</pre> |
| Zip      | <pre>zip [OPTIONS] [FILE]</pre>        | Compress files into a zip archive                                | <pre>zip archive.zip file1.txt file2.txt</pre> |
| Unzip    | <pre>unzip [OPTIONS] [FILE]</pre>      | Uncompress files from a zip archive                              | <pre>unzip archive.zip</pre>                   |
| Hostname | <pre>hostname</pre>                    | Print the name of the current host system                        | <pre>hostname</pre>                            |
| Ping     | <pre>ping [OPTIONS] HOSTNAME /IP</pre> | Send ICMP ECHO_REQUEST packets to a network host                 | <pre>ping google.com</pre>                     |
| Ifconfig | <pre>ifconfig [INTERFA CE]</pre>       | Display or configure network interface parameters                | <pre>ifconfig</pre>                            |
| IP       | <pre>ip [OPTIONS] ]</pre>              | Show or manipulate routing, devices, policy routing, and tunnels | <pre>ip addr</pre>                             |

| Command | Syntax  | Description                       | Example  |
|---------|---|-----------------------------------|--|
| Curl    | <code>curl</code><br><code>[OPTIONS]</code><br><code>] URL</code> | Transfer data from or to a server | <code>curl https://some_website.com</code>                               |
| Wget    | <code>wget</code><br><code>[OPTIONS]</code><br><code>] URL</code> | Download files from the web       | <code>wget</code><br><code>https://some_website.com/some_file.txt</code> |

## Introduction to Shell Scripting

| Command           | Syntax  | Description                                      | Example                      |
|-------------------|---|--|------------------------------|
| Shebang           | <code>#!/bin/[shell]</code>                           | First line of shell script                       | <code>#!/bin/bash</code>     |
| Pipe              | <code>filter1   filter2</code>                        | Chain any number of filters                      | <code>ls   sort -r</code>    |
| Locate executable | <code>which</code><br><code>[EXECUTABLE]</code>       | Display location of <code>bash</code> executable | <code>which bash</code>      |
| Bash              | <code>bash [SCRIPT]</code>                            | Interpret and run script using Bash shell        | <code>bash script.txt</code> |
| Set               | <code>set [OPTION]</code>                             | List all shell variables                         | <code>set</code>             |
| Define variable   | <code>[VARIABLE_NAME]=</code><br><code>[VALUE]</code> | Define shell variable by name and assign value   | <code>name="John"</code>     |
| Read              | <code>read [VARIABLE]</code>                          | Read from standard input and                     | <code>read name</code>       |

| Command  | Syntax   | Description  | Example  |
|--|--|--|--|
|  |  | store result in variable                                 |  |
| Env  | <code>env</code>                                     | Print all environment variables and their values         | <code>env</code>   |
| Export   | <code>export</code><br><code>[VARIABLE]</code>       | Extend scope of local variable to all child processes    | <code>export name</code>   |
| Crontab  | <code>crontab</code><br><code>[OPTIONS]</code>       | Open crontab default editor                              | <code>crontab -e</code>  |
|  |  | List all cron jobs                                       | <code>crontab -l</code>  |
| Schedule tasks to run at specified times using cron daemon | <code>m h dom mon dow</code><br><code>command</code> | Append date/time to file every Sunday at 6:15 pm         | <code>15 18 * * 0 date &gt;&gt;</code><br><code>sundays.txt</code>                       |
|  |  | Back up home directory every Monday at 3:00 am           | <code>0 3 * * 1 tar -cvf</code><br><code>my_backup_path\my_archive.tar.gz \$HOME\</code> |
|  |  | Run shell script first minute of first day of each month | <code>1 0 1 * *</code><br><code>./My_Script.sh</code>                                    |

## Authors

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## Change Log

| Date (YYYY-MM-DD) | Version | Changed By    | Change Description                     |
|-------------------|---------|---------------|--|
| 2023-06-07        | 1.2     | Jeff Grossman | Add missing content                    |
| 2023-05-10        | 2.0     | Nick Yi       | Created table version                  |
| 2023-04-26        | 1.3     | Nick Yi       | Updated to reflect cheat sheet changes |
| 2023-03-20        | 1.2     | Jeff Grossman | Add text wrangling content             |
| 2023-03-08        | 1.1     | Jeff Grossman | Add content for M4 Projects            |
| 2023-03-08        | 1.0     | Jeff Grossman | Merge from module cheat sheets         |

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