

## Lab 03 - Navigating

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**Course/Section:** IS-1003-ON1

**Date:** 02/25/25

### INTRODUCTION

The goal of this lab is to get familiar with using the command line terminal in both Windows PowerShell and Linux Bash.

### BREAKPOINT 1

The first terminal that I accessed was on my Linux based system. I have the terminal application shortcut located in the dock on my home screen for easy access. After opening I used the Bash command **pwd** to print my working directory path which is **/home/jason-guzman**. The current user is jason-guzman, the current OS is PopOS, and the command prompt is indicated by the dollar sign (\$). This is shown below.

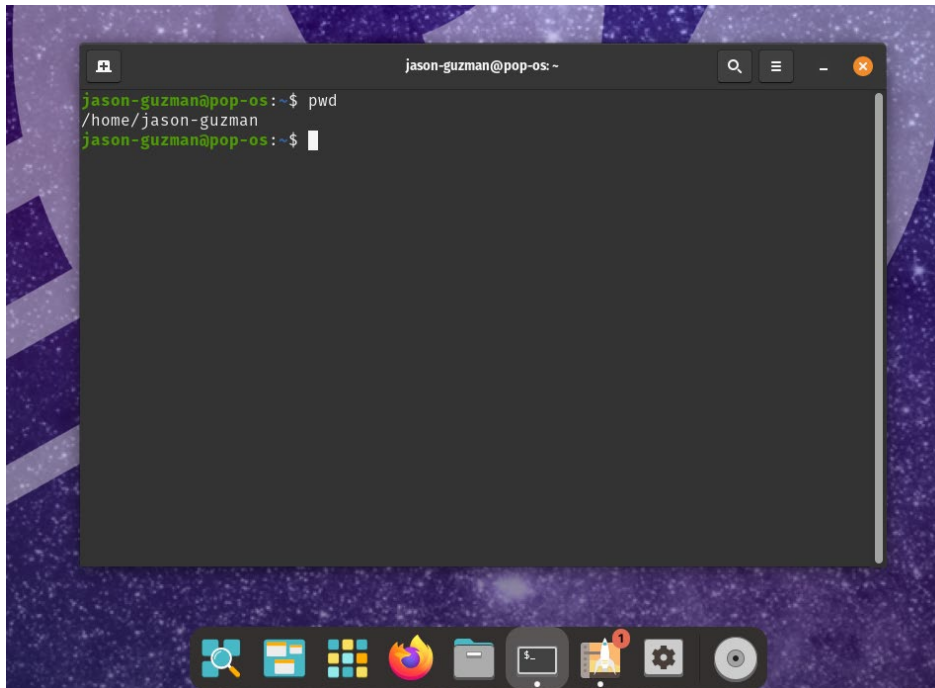


Figure 1 Working directory of Linux terminal

The next terminal that I accessed was on my Windows based system. To access the terminal, I pressed the Windows key on my keyboard and searched for Windows PowerShell. The pathname that I am in is located on my C: drive and is **\Users\IAmJa**. The current user is IAmJa, the current OS is Windows 11, and the command prompt is indicated by the greater than sign (>). This is shown below.

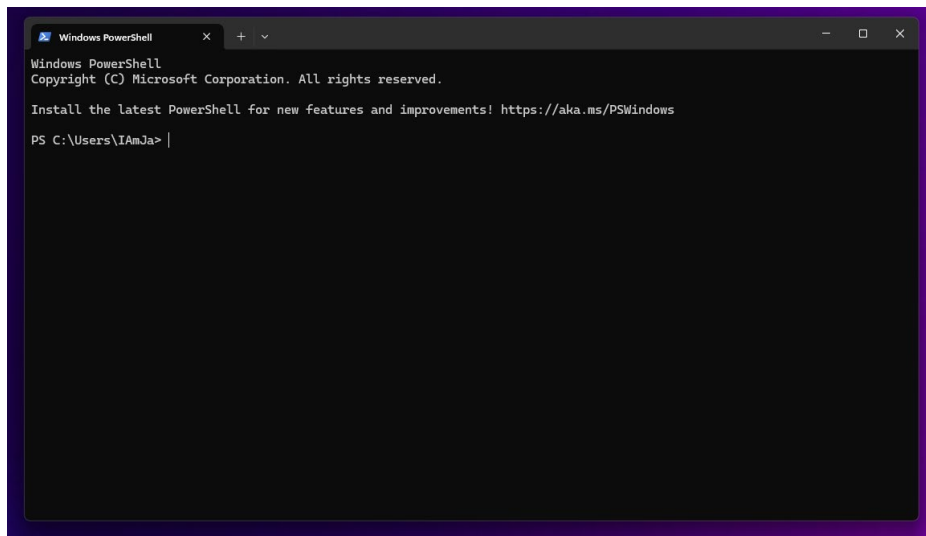


Figure 2 Windows PowerShell terminal

## BREAKPOINT 2

The folders listed in my home user folder are *Desktop*, *Documents*, *Downloads*, *Music*, *Public*, *Templates*, and *Videos*. In the screenshot below you can see the comparison of both the graphical user interface and command line interface.

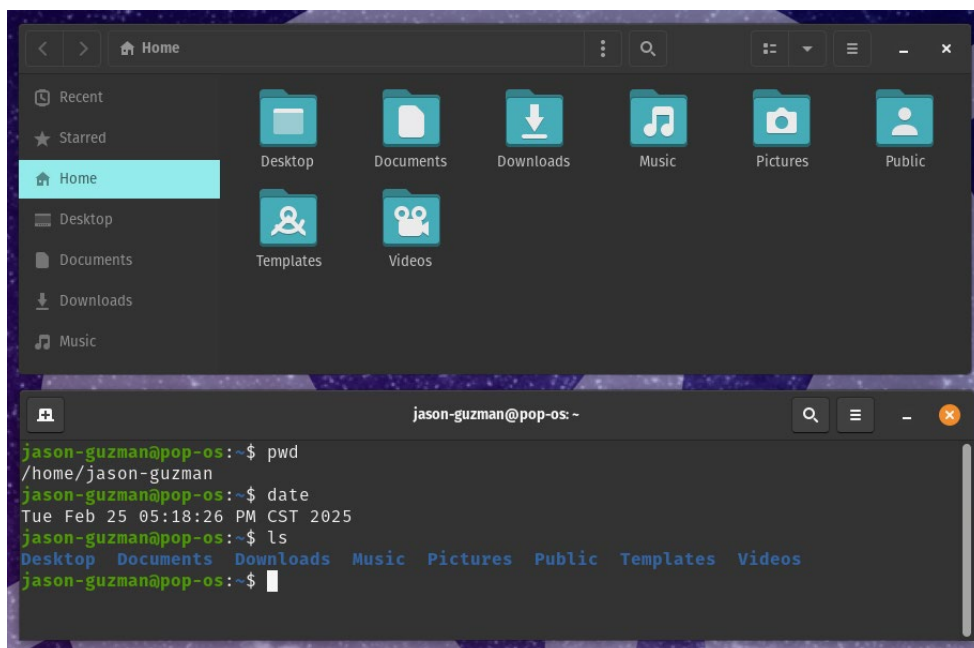


Figure 3 Home directory in GUI and CLI

Both interfaces share the same information but in different formats, visual and text based. To reach the *Home* folder via GUI, I clicked on the files icon located on my desktop dock and the *Home* folder was open automatically. To reach it via CLI, I had to open the terminal and confirm that I was automatically located in the *Home* folder by using the command **pwd**. After seeing that I am in the correct folder I used the command **ls** to list the directories located in the *Home* directory.

### BREAKPOINT 3

The folders listed in my home folder are pretty similar to those found in my Linux system although I have used my Windows computer a lot longer therefore some files have found themselves located there. In the screenshot below you can see the comparison of the GUI and CLI of the home folder.

C:\Users\IAmJa\Documents\UTSA-Spring25\IS-1003

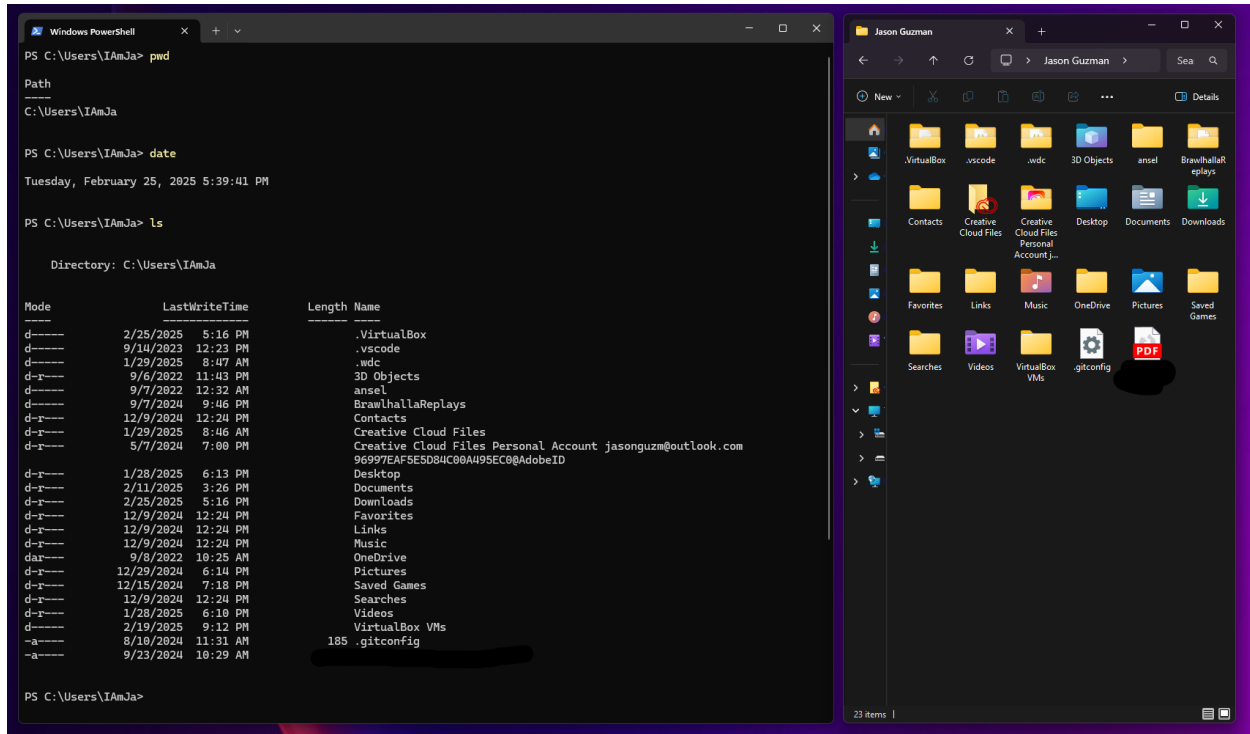


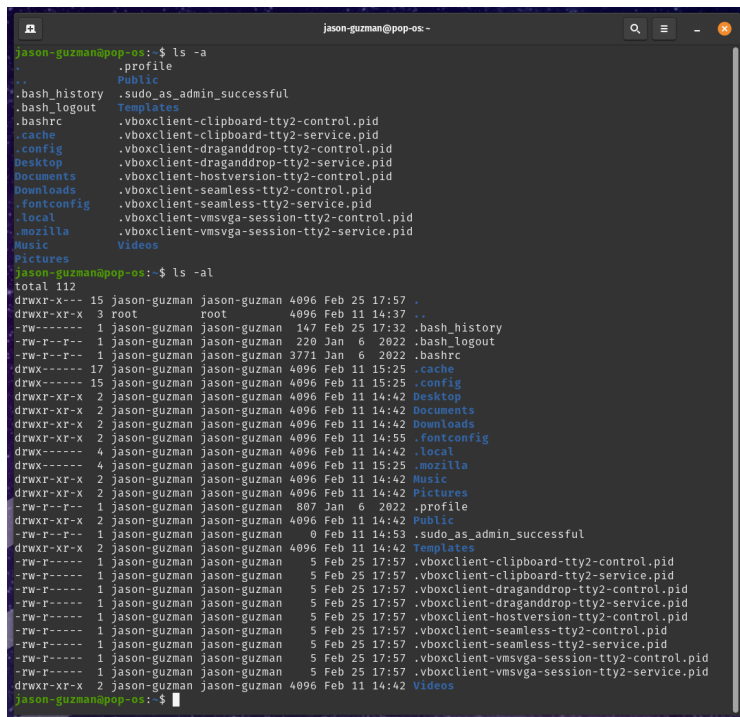
Figure 4 Home folder in PowerShell and Files app

Windows PowerShell shows more information about each file than the Linux bash terminal, including flags and last date and time edited. The file application can also show this information, although I only have it set to show icons only. I keep most of my school files on the cloud to access on different devices, but because I mostly use my desktop in this class I do have a folder located at:

C:\Users\IAmJa\Documents\UTSA-Spring25\IS-1003

### BREAKPOINT 4

The first set of commands that we are learning involves the **ls** command. This command lists the directories of the current working directory. When we attach the all option, shown as **-a**, it shows all files including hidden ones. When we attach the all-long option, shown as **-al**, it shows all files including hidden with owner, permissions, size and edit date. This is shown below.

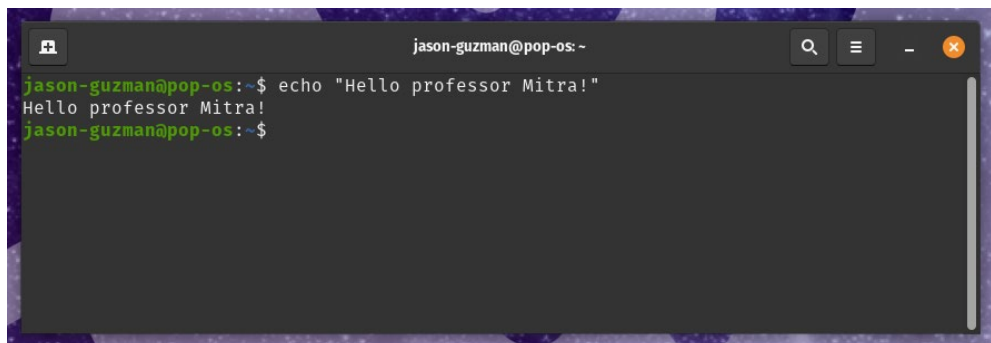


```

jason-guzman@pop-os:~$ ls -a
.
..
.profile
Public
.bash_history
.bash_logout
Templates
.vboxclient-clipboard-tty2-control.pid
.vboxclient-clipboard-tty2-service.pid
.cache
.config
Desktop
Documents
Downloads
.fontconfig
.local
.mozilla
Music
Pictures
Videos
jason-guzman@pop-os:~$ ls -al
total 112
drwxr-xr-x 15 jason-guzman jason-guzman 4096 Feb 25 17:57 .
drwxr-xr-x  3 root         root         4096 Feb 11 14:37 ..
-rw-r----- 1 jason-guzman jason-guzman 147 Feb 25 17:32 .bash_history
-rw-r----- 1 jason-guzman jason-guzman 220 Jan  6 2022 .bash_logout
-rw-r----- 1 jason-guzman jason-guzman 3771 Jan  6 2022 .bashrc
drwx----- 17 jason-guzman jason-guzman 4096 Feb 11 15:25 .cache
drwx----- 15 jason-guzman jason-guzman 4096 Feb 11 15:25 .config
drwxr-xr-x  2 jason-guzman jason-guzman 4096 Feb 11 14:42 Desktop
drwxr-xr-x  2 jason-guzman jason-guzman 4096 Feb 11 14:42 Documents
drwxr-xr-x  2 jason-guzman jason-guzman 4096 Feb 11 14:42 Downloads
drwxr-xr-x  2 jason-guzman jason-guzman 4096 Feb 11 14:55 .fontconfig
drwx----- 4 jason-guzman jason-guzman 4096 Feb 11 14:42 .local
drwx----- 4 jason-guzman jason-guzman 4096 Feb 11 15:25 .mozilla
drwxr-xr-x  2 jason-guzman jason-guzman 4096 Feb 11 14:42 Music
drwxr-xr-x  2 jason-guzman jason-guzman 4096 Feb 11 14:42 Pictures
-rw-r----- 1 jason-guzman jason-guzman 807 Jan  6 2022 .profile
drwxr-xr-x  2 jason-guzman jason-guzman 4096 Feb 11 14:42 Public
-rw-r----- 1 jason-guzman jason-guzman  0 Feb 11 14:53 .sudo_as_admin_successful
drwxr-xr-x  2 jason-guzman jason-guzman 4096 Feb 11 14:42 Templates
-rw-r----- 1 jason-guzman jason-guzman  5 Feb 25 17:57 .vboxclient-clipboard-tty2-control.pid
-rw-r----- 1 jason-guzman jason-guzman  5 Feb 25 17:57 .vboxclient-clipboard-tty2-service.pid
-rw-r----- 1 jason-guzman jason-guzman  5 Feb 25 17:57 .vboxclient-draganddrop-tty2-control.pid
-rw-r----- 1 jason-guzman jason-guzman  5 Feb 25 17:57 .vboxclient-draganddrop-tty2-service.pid
-rw-r----- 1 jason-guzman jason-guzman  5 Feb 25 17:57 .vboxclient-hostversion-tty2-control.pid
-rw-r----- 1 jason-guzman jason-guzman  5 Feb 25 17:57 .vboxclient-seamless-tty2-control.pid
-rw-r----- 1 jason-guzman jason-guzman  5 Feb 25 17:57 .vboxclient-seamless-tty2-service.pid
-rw-r----- 1 jason-guzman jason-guzman  5 Feb 25 17:57 .vboxclient-vmvga-session-tty2-control.pid
-rw-r----- 1 jason-guzman jason-guzman  5 Feb 25 17:57 .vboxclient-vmvga-session-tty2-service.pid
drwxr-xr-x  2 jason-guzman jason-guzman 4096 Feb 11 14:42 Videos
jason-guzman@pop-os:~$
```

Figure 5 Bash list all and list all long commands

The next command is the **echo** command, this command prints your input into the terminal. Below I typed the **echo** command then a string that says “Hello professor Mitra” in quotations. Once run the command the string is outputted to the console.

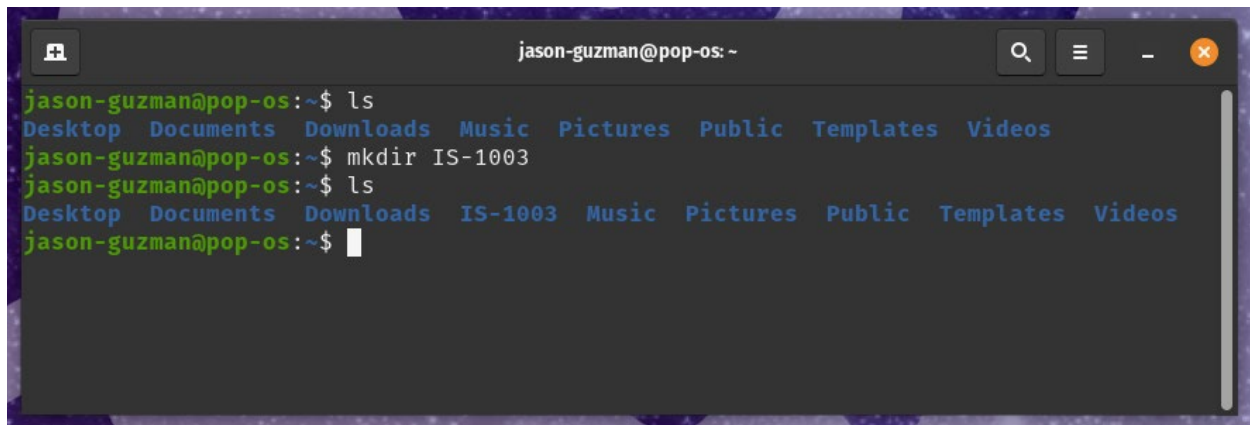


```

jason-guzman@pop-os:~$ echo "Hello professor Mitra!"
Hello professor Mitra!
jason-guzman@pop-os:~$
```

Figure 6 Bash echo command

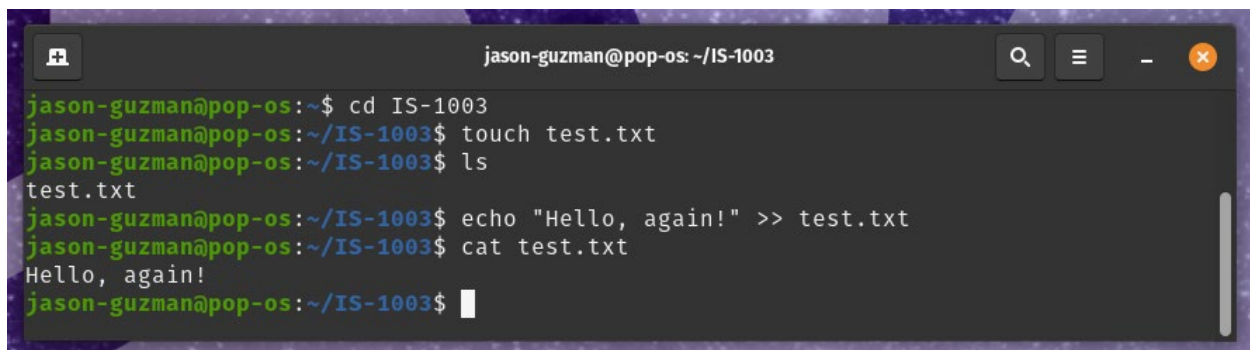
Next, we learned how to work with creating, removing, editing, and moving directories and their contents. First I listed the files in the home directory with **ls** and then created a new directory with the command **mkdir** called “IS-1003”. This command creates a folder within the current folder. Below is a screenshot that shows the contents of the *Home* folder before and after adding IS-1003.

A terminal window titled 'jason-guzman@pop-os: ~' with search, menu, and window control icons. The user enters 'ls' and sees a list of directories: Desktop, Documents, Downloads, Music, Pictures, Public, Templates, Videos. Then they enter 'mkdir IS-1003' and 'ls' again, and the new directory 'IS-1003' appears in the list.

```
jason-guzman@pop-os: ~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos
jason-guzman@pop-os: ~$ mkdir IS-1003
jason-guzman@pop-os: ~$ ls
Desktop Documents Downloads IS-1003 Music Pictures Public Templates Videos
jason-guzman@pop-os: ~$
```

Figure 7 Executing mkdir command in Bash

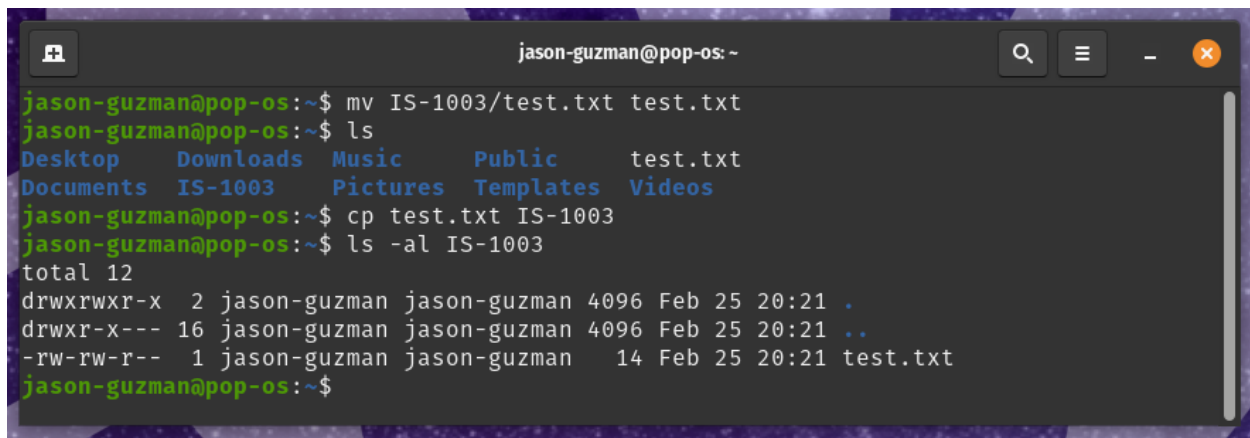
Next, I changed directories to the IS-1003 folder with the **cd** command. In this folder I created a new text file using the command **touch** which creates new files by adding the file name and type (ex. File-name.type). I listed the contents of the IS-1003 folder to show it's creation. I then used the **echo** command to add text into the test.txt file. The command **cat** allows the test.txt file to be printed into the console.

A terminal window titled 'jason-guzman@pop-os: ~/IS-1003' with search, menu, and window control icons. The user enters 'cd IS-1003', then 'touch test.txt', and 'ls' which shows 'test.txt'. Then they enter 'echo "Hello, again!" >> test.txt', 'cat test.txt' which prints 'Hello, again!', and finally a blank line.

```
jason-guzman@pop-os: ~/IS-1003$ cd IS-1003
jason-guzman@pop-os: ~/IS-1003$ touch test.txt
jason-guzman@pop-os: ~/IS-1003$ ls
test.txt
jason-guzman@pop-os: ~/IS-1003$ echo "Hello, again!" >> test.txt
jason-guzman@pop-os: ~/IS-1003$ cat test.txt
Hello, again!
jason-guzman@pop-os: ~/IS-1003$
```

Figure 8 Creating and testing text file in Bash

After creating the test file, I went back to the *Home* folder and moved the test.txt file from IS-1003 to Home. To do this I used the **mv** command with the target directory and file to be moved. Next I listed the contents of the home folder to show this was done successfully. I then copied the test file from the home folder to the IS-1003 folder using the copy command **cp**. I then listed the contents of the IS-1003 folder to show it completion.

A terminal window titled 'jason-guzman@pop-os: ~' with search, menu, and window control icons. It shows a sequence of commands: moving 'test.txt' from 'IS-1003/' to the current directory, listing files, copying 'test.txt' to 'IS-1003', and listing the contents of 'IS-1003' with long format. The output shows the file 'test.txt' with permissions '-rw-rw-r--', owner 'jason-guzman', group 'jason-guzman', size '14', and date 'Feb 25 20:21'.

```
jason-guzman@pop-os: ~  
jason-guzman@pop-os:~$ mv IS-1003/test.txt test.txt  
jason-guzman@pop-os:~$ ls  
Desktop  Downloads  Music      Public      test.txt  
Documents IS-1003    Pictures   Templates   Videos  
jason-guzman@pop-os:~$ cp test.txt IS-1003  
jason-guzman@pop-os:~$ ls -al IS-1003  
total 12  
drwxrwxr-x  2 jason-guzman jason-guzman 4096 Feb 25 20:21 .  
drwxr-x--- 16 jason-guzman jason-guzman 4096 Feb 25 20:21 ..  
-rw-rw-r--  1 jason-guzman jason-guzman   14 Feb 25 20:21 test.txt  
jason-guzman@pop-os:~$
```

Figure 9 Moving and copying files in Bash

The last step is to remove the IS-1003 folder. First I used the command **rm** with the directory I chose with the child **\***, which means all. This removed all contents of the IS-1003 folder. In order to remove the directory itself, I used the **rmdir** command which is remove directory.

A terminal window titled 'jason-guzman@pop-os: ~' showing the removal of the 'IS-1003' directory. The commands are 'rm IS-1003/\*' to remove contents and 'rmdir IS-1003' to remove the directory. A subsequent 'ls' command shows the updated directory listing where 'IS-1003' is no longer present.

```
jason-guzman@pop-os: ~  
jason-guzman@pop-os:~$ rm IS-1003/*  
jason-guzman@pop-os:~$ rmdir IS-1003  
jason-guzman@pop-os:~$ ls  
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  test.txt  Videos  
jason-guzman@pop-os:~$
```

## BREAKPOINT 5

The final step in this lab was to recreate the results of the Bash command in Linux in Windows PowerShell using **cmdlet** equivalents. The first step is to list the contents of the Home folder using the list command **Get-ChildItem** with the option **-Force** attached. This option shows all available contents in the Home folder including hidden items and directories.

```

Windows PowerShell
PS C:\Users\IAMJa> Get-ChildItem -Force

Directory: C:\Users\IAMJa

Mode                LastWriteTime         Length Name
----                -
d----- 8/10/2024 11:03 AM             .git
d----- 2/25/2025 8:35 PM          .VirtualBox
d----- 9/14/2023 12:23 PM          .vscode
d----- 1/29/2025 8:47 AM           .wdc
d----- 9/6/2022 11:43 PM          3D Objects
d----- 9/7/2022 12:32 AM          ansel
d----- 12/9/2024 12:14 PM        AppData
d----- 12/9/2024 11:44 AM        Application Data
d----- 9/7/2024 9:46 PM        BrawlhallaReplays
d----- 12/9/2024 12:20 PM        Contacts
d----- 12/9/2024 11:44 AM        Cookies
d----- 1/29/2025 8:46 AM        Creative Cloud Files
d----- 5/7/2024 7:00 PM        Creative Cloud Files Personal Account jasonguzm@outlook.com
d----- 1/28/2025 6:13 PM        Desktop
d----- 2/11/2025 3:26 PM        Documents
d----- 2/25/2025 5:16 PM        Downloads
d----- 12/9/2024 12:24 PM        Favorites
d----- 9/7/2022 1:04 AM        InstallAnywhere
d----- 12/9/2024 12:24 PM        Links
d----- 12/9/2024 11:44 AM        Local Settings
d----- 12/9/2024 12:24 PM        Music
d----- 12/9/2024 11:44 AM        My Documents
d----- 12/9/2024 11:44 AM        NetHood
d----- 9/8/2022 10:25 AM        OneDrive
d----- 12/29/2024 6:14 PM        Pictures
d----- 12/9/2024 11:44 AM        PrintHood
d----- 12/9/2024 11:44 AM        Recent
d----- 12/15/2024 7:18 PM        Saved Games
d----- 12/9/2024 12:20 PM        Searches
d----- 12/9/2024 11:44 AM        SendTo
d----- 12/9/2024 11:44 AM        Start Menu
d----- 12/9/2024 11:44 AM        Templates
d----- 1/28/2025 6:10 PM        Videos
d----- 2/19/2025 9:12 PM        VirtualBox VMs
-a----- 8/10/2024 11:31 AM        185 gitconfig
-a----- 9/23/2024 10:29 AM        88614 nordpass_recovery_code.pdf
-a----- 2/24/2025 10:24 PM        24641536 NTUSER.DAT
-a----- 12/9/2024 11:44 AM        3145728 ntuser.dat.LOG1
-a----- 12/9/2024 11:44 AM        3145728 ntuser.dat.LOG2
-a----- 12/9/2024 11:44 AM        65536 NTUSER.DAT[2ad838bc-efea-11ee-a54d-000d3a94eaal].TM.blf
-a----- 12/9/2024 11:44 AM        524288 NTUSER.DAT[2ad838bc-efea-11ee-a54d-000d3a94eaal].THContainer000000000
-a----- 12/9/2024 11:44 AM        00000000001.regtrans-ms
-a----- 12/9/2024 11:44 AM        524288 NTUSER.DAT[2ad838bc-efea-11ee-a54d-000d3a94eaal].THContainer000000000
-a----- 12/9/2024 11:44 AM        00000000002.regtrans-ms
---hs- 12/9/2024 12:24 PM        20 ntuser.ini
PS C:\Users\IAMJa>

```

Figure 10 List all items in PowerShell

The next list option I added was **-Directory**. This only allows directories to be listed and with **-Force** it allows for hidden directories to also be listed. This is shown below.

```

Windows PowerShell
PS C:\Users\IAMJa> Get-ChildItem -Directory -Force

Directory: C:\Users\IAMJa

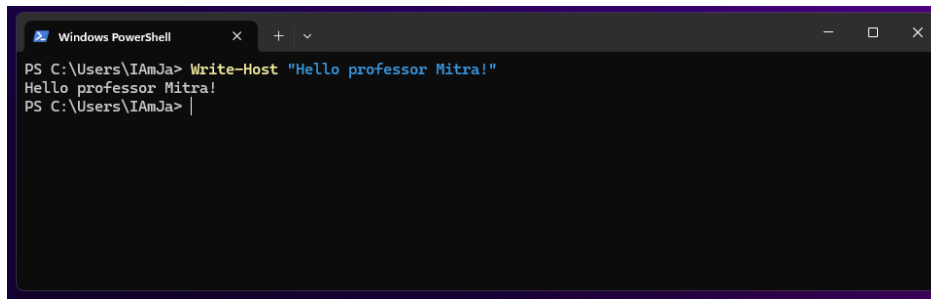
Mode                LastWriteTime         Length Name
----                -
d----- 8/10/2024 11:03 AM             .git
d----- 2/25/2025 8:35 PM          .VirtualBox
d----- 9/14/2023 12:23 PM          .vscode
d----- 1/29/2025 8:47 AM           .wdc
d----- 9/6/2022 11:43 PM          3D Objects
d----- 9/7/2022 12:32 AM          ansel
d----- 12/9/2024 12:14 PM        AppData
d----- 12/9/2024 11:44 AM        Application Data
d----- 9/7/2024 9:46 PM        BrawlhallaReplays
d----- 12/9/2024 12:20 PM        Contacts
d----- 12/9/2024 11:44 AM        Cookies
d----- 1/29/2025 8:46 AM        Creative Cloud Files
d----- 5/7/2024 7:00 PM        Creative Cloud Files Personal Account jasonguzm@outlook.com
d----- 1/28/2025 6:13 PM        Desktop
d----- 2/11/2025 3:26 PM        Documents
d----- 2/25/2025 5:16 PM        Downloads
d----- 12/9/2024 12:24 PM        Favorites
d----- 9/7/2022 1:04 AM        InstallAnywhere
d----- 12/9/2024 12:24 PM        Links
d----- 12/9/2024 11:44 AM        Local Settings
d----- 12/9/2024 12:24 PM        Music
d----- 12/9/2024 11:44 AM        My Documents
d----- 12/9/2024 11:44 AM        NetHood
d----- 9/8/2022 10:25 AM        OneDrive
d----- 12/29/2024 6:14 PM        Pictures
d----- 12/9/2024 11:44 AM        PrintHood
d----- 12/9/2024 11:44 AM        Recent
d----- 12/15/2024 7:18 PM        Saved Games
d----- 12/9/2024 12:24 PM        Searches
d----- 12/9/2024 11:44 AM        SendTo
d----- 12/9/2024 11:44 AM        Start Menu
d----- 12/9/2024 11:44 AM        Templates
d----- 1/28/2025 6:10 PM        Videos
d----- 2/19/2025 9:12 PM        VirtualBox VMs
PS C:\Users\IAMJa>

```

Figure 11 List all directories in PowerShell



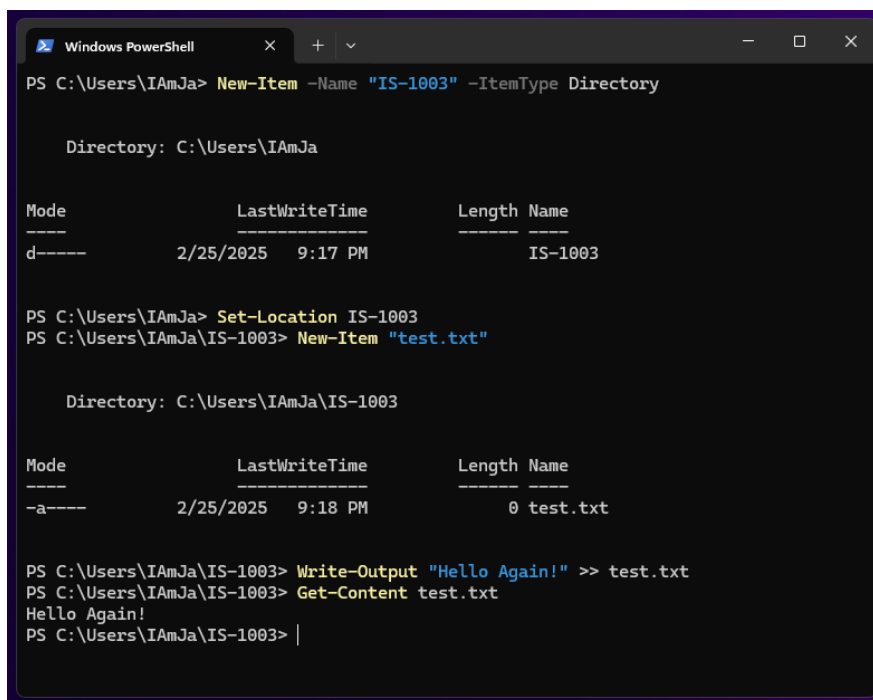
Next, I used the print command **Write-Host** to print “Hello professor Mitra!” to the console.



```
Windows PowerShell
PS C:\Users\IAmJa> Write-Host "Hello professor Mitra!"
Hello professor Mitra!
PS C:\Users\IAmJa> |
```

Figure 12 Printing a string to the console

The next step was to create a new directory in the home folder. To do this I used the **New-Item** command with **-Name** to set the name to “IS-1003” then **-ItemType** to set the type of item to directory. I then used **Set-Location** to change directories to IS-1003 and created a new item again called “test.txt”. I used the **Write-Output** command to write “Hello Again!” into the text file. In order to read the contents of the test.txt file I used the command **Get-Content** with the file name to print the contents of test.txt to the console.



```
Windows PowerShell
PS C:\Users\IAmJa> New-Item -Name "IS-1003" -ItemType Directory

Directory: C:\Users\IAmJa

Mode                LastWriteTime         Length Name
----                -
d-----          2/25/2025   9:17 PM             IS-1003

PS C:\Users\IAmJa> Set-Location IS-1003
PS C:\Users\IAmJa\IS-1003> New-Item "test.txt"

Directory: C:\Users\IAmJa\IS-1003

Mode                LastWriteTime         Length Name
----                -
-a-----          2/25/2025   9:18 PM              0 test.txt

PS C:\Users\IAmJa\IS-1003> Write-Output "Hello Again!" >> test.txt
PS C:\Users\IAmJa\IS-1003> Get-Content test.txt
Hello Again!
PS C:\Users\IAmJa\IS-1003> |
```

Figure 13 Creating new directories and files

The next step was to move the item we just created, test.txt. into our home directory, create a copy of it to IS-1003, then remove the IS-1003 directory. To start, I used the **Move-Item** command with the target path and name to be moved into home. I then confirmed it was moved using **Get-ChildItem -Directory**.



Then I copied the test.txt file from the home directory to IS-1003 using the **Copy-Item** command with **-path** of test.txt and **-Destination** of IS-1003. The last step was to remove the IS-1003 directory and check for completion. I used the command **Remove-Item** and the target directory IS-1003.

```

Windows PowerShell
PS C:\Users\IAmJa> Move-Item .\IS-1003\test.txt .\test.txt
PS C:\Users\IAmJa> Get-ChildItem -Directory

Directory: C:\Users\IAmJa

Mode                LastWriteTime         Length Name
----                -
d-----         2/25/2025   8:35 PM             .VirtualBox
d-----         9/14/2023  12:23 PM             .vscode
d-----         1/29/2025   8:47 AM             .wdc
d-r-----         9/6/2022  11:43 PM           3D Objects
d-----         9/7/2022  12:32 AM             ansel
d-----         9/7/2024   9:46 PM      BrawlhallaReplays
d-r-----        12/9/2024  12:24 PM           Contacts
d-r-----        1/29/2025   8:46 AM      Creative Cloud Files
d-r-----         5/7/2024   7:00 PM      Creative Cloud Files Personal
Account jasanguzm@outlook.com 9
6997EAF5E5D84C00A495EC0@AdobeID
d-r-----        1/28/2025   6:13 PM           Desktop
d-r-----        2/11/2025   3:26 PM          Documents
d-r-----        2/25/2025   5:16 PM          Downloads
d-r-----        12/9/2024  12:24 PM          Favorites
d-----        2/25/2025   9:18 PM             IS-1003
d-r-----        12/9/2024  12:24 PM           Links
d-r-----        12/9/2024  12:24 PM           Music
dar-----         9/8/2022  10:25 AM          OneDrive
d-r-----        12/29/2024   6:14 PM          Pictures
d-r-----        12/15/2024   7:18 PM        Saved Games
d-r-----        12/9/2024  12:24 PM          Searches
d-r-----        1/28/2025   6:10 PM          Videos
d-----        2/19/2025   9:12 PM      VirtualBox VMs

PS C:\Users\IAmJa> Copy-Item -Path test.txt -Destination IS-1003
PS C:\Users\IAmJa> Remove-Item IS-1003

Confirm
The item at C:\Users\IAmJa\IS-1003 has children and the Recurse parameter was not
specified. If you continue, all children will be removed with the item. Are you sure
you want to continue?
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help
(default is "Y"):y

```

```

PS C:\Users\IAmJa> Get-ChildItem -Directory

Directory: C:\Users\IAmJa

Mode                LastWriteTime         Length Name
----                -
d-----         2/25/2025   8:35 PM             .VirtualBox
d-----         9/14/2023  12:23 PM             .vscode
d-----         1/29/2025   8:47 AM             .wdc
d-r-----         9/6/2022  11:43 PM           3D Objects
d-----         9/7/2022  12:32 AM             ansel
d-----         9/7/2024   9:46 PM      BrawlhallaReplays
d-r-----        12/9/2024  12:24 PM           Contacts
d-r-----        1/29/2025   8:46 AM      Creative Cloud Files
d-r-----         5/7/2024   7:00 PM      Creative Cloud Files Personal
Account jasanguzm@outlook.com 9
6997EAF5E5D84C00A495EC0@AdobeID
d-r-----        1/28/2025   6:13 PM           Desktop
d-r-----        2/11/2025   3:26 PM          Documents
d-r-----        2/25/2025   5:16 PM          Downloads
d-r-----        12/9/2024  12:24 PM          Favorites
d-r-----        12/9/2024  12:24 PM           Links
d-r-----        12/9/2024  12:24 PM           Music
dar-----         9/8/2022  10:25 AM          OneDrive
d-r-----        12/29/2024   6:14 PM          Pictures
d-r-----        12/15/2024   7:18 PM        Saved Games
d-r-----        12/9/2024  12:24 PM          Searches
d-r-----        1/28/2025   6:10 PM          Videos
d-----        2/19/2025   9:12 PM      VirtualBox VMs

PS C:\Users\IAmJa>

```

## CONCLUSION

This lab was a good refresher on how to navigate through the command line with Bash and PowerShell. I have used Bash before for version control, but I have not used PowerShell very much. I know some commands from Bash didn't work, such as touch, but I didn't know it had its own command names.

Practicing navigating the command and learning to read it better will be beneficial when doing capture the flags and version control.

## REFERENCES

R. Mitra, "*Lab 03: Navigating*," The University of Texas at San Antonio (2025). Last accessed: *Feb. 25, 2025*.

## COLLABORATION

I worked on this lab solely with the instruction of Professor Mitra.