

INFO 2603 – Lab 7– Windows CLI

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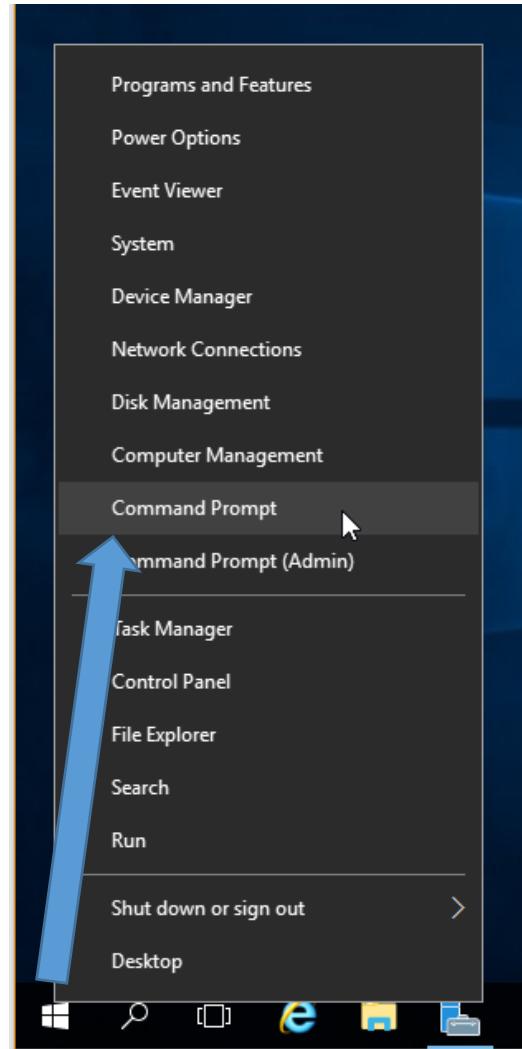
Outline - Windows Command Line Interface (CLI) Introduction

- Navigating directories
 - cmd help
 - dir, cd
 - Current directory (.)
 - Parent directory (..)
 - Relative and absolute paths
 - tree
 - md (mkdir), rd, move, del
 - Windows Directories
 - C:\ul> - system, boot, pagefile.sys, hiberfil.sys
 - C:\Windows
 - C:\Users
 - C:\ProgramData
- Change to a different drive.

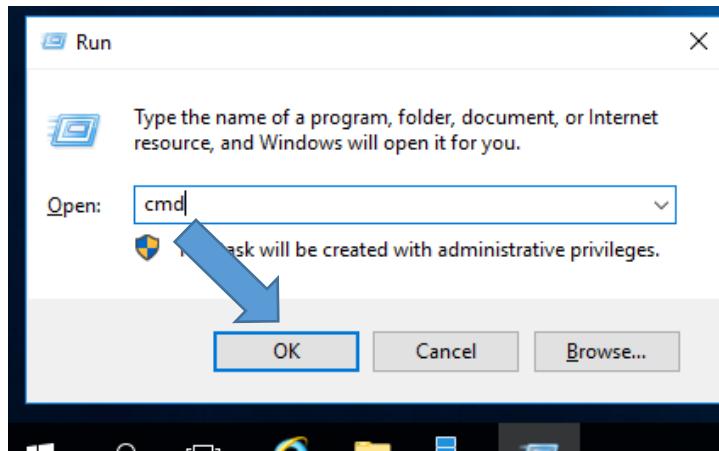
Outline - Windows Command Line Interface (CLI) Introduction

- CLI Commands
 - echo command
 - REM command
 - :: command
 - @ command
 - find command
 - pipe (|)
 - type
 - more
 - pause
 - timeout
- Output redirection
 - >
 - >>
 - <
 - 2>&1
 - >CON
 - NUL

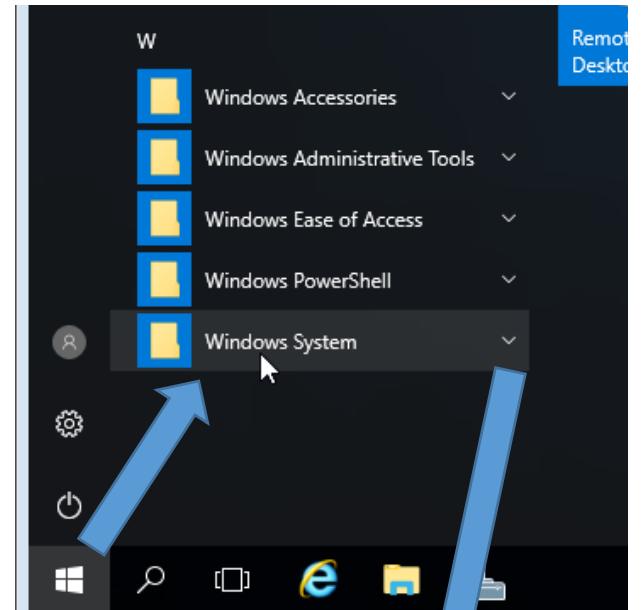
Launching the Windows CLI



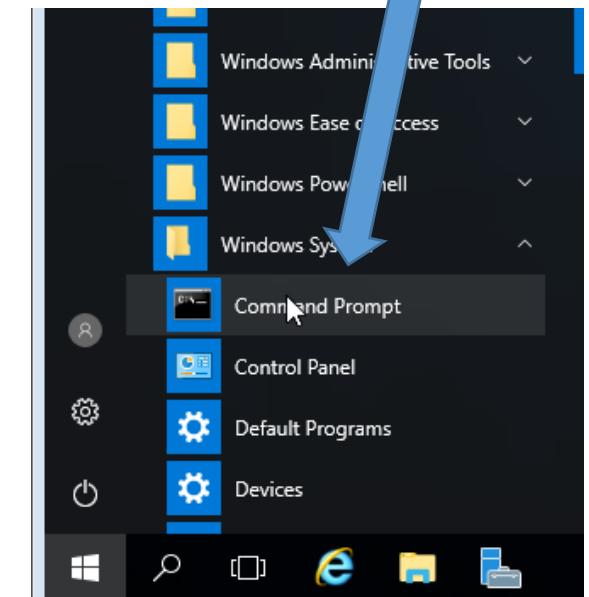
OR



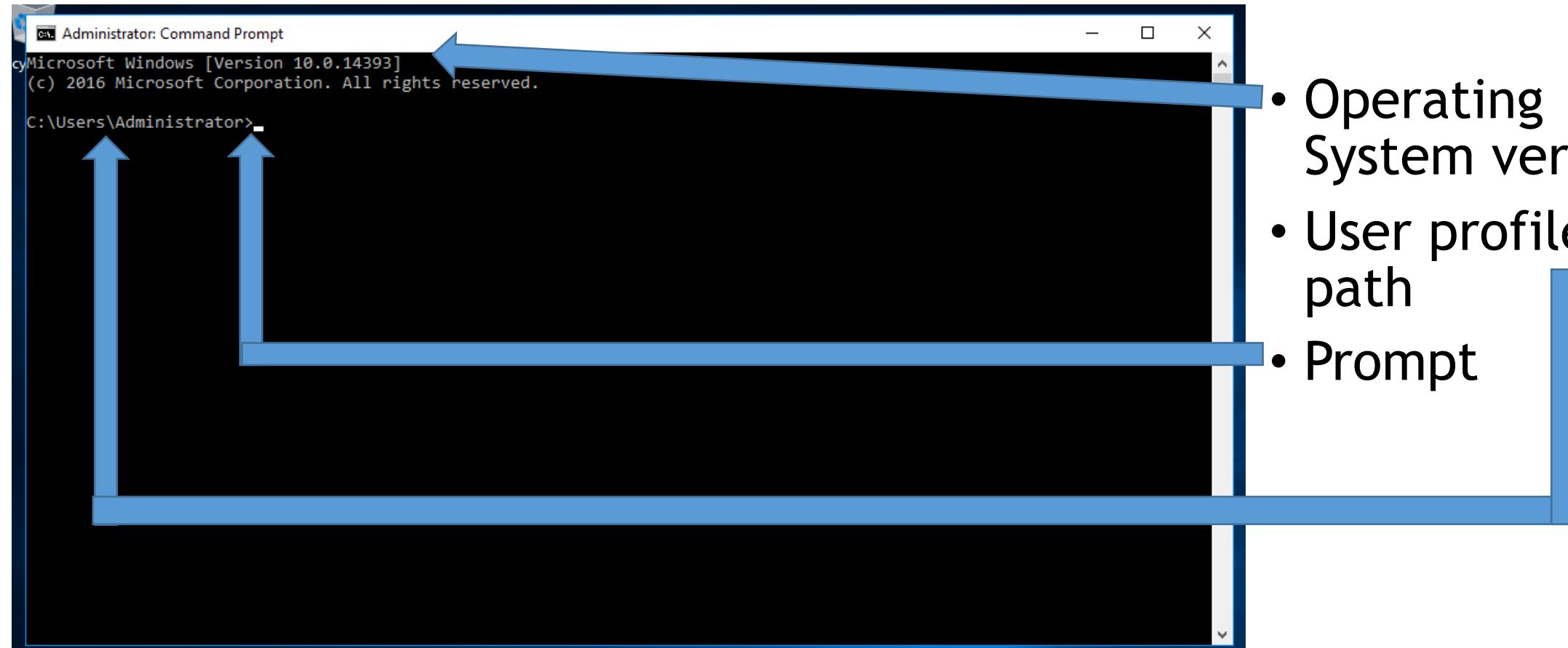
OR



- 1) Right click on start menu → Select “Command Prompt”
- 2) Windows Key + R → Type “cmd” → Click “Ok”
- 3) Start → Expand “Windows System” → Click on “Command Prompt”



Launching the Windows CLI



CMD – Help Command

```
Administrator: Command Prompt  
Microsoft Windows [Version 10.0.14393]  
(c) 2016 Microsoft Corporation. All rights reserved.  
  
C:\Users\Administrator>help  
For more information on a specific command, type HELP command-name  
ASSOC           Displays or modifies file extension associations.  
ATTRIB          Displays or changes file attributes.  
BREAK           Sets or clears extended CTRL+C checking.  
BCDEDIT         Sets properties in boot database to control boot loading.  
CACLS           Displays or modifies access control lists (ACLs) of files.  
CALL            Calls one batch program from another.  
CD               Displays the name of or changes the current directory.  
CHCP             Displays or sets the active code page number.  
CHDIR           Displays the name of or changes the current directory.  
CHKDSK          Checks a disk and displays a status report.  
CHKNTFS         Displays or modifies the checking of disk at boot time.  
CLS              Clears the screen.  
CMD              Starts a new instance of the Windows command interpreter.  
COLOR            Sets the default console foreground and background colors.  
COMP             Compares the contents of two files or sets of files.  
COMPACT          Displays or alters the compression of files on NTFS partitions.  
CONVERT          Converts FAT volumes to NTFS. You cannot convert the  
                  current drive.  
COPY             Copies one or more files to another location.  
DATE             Displays or sets the date.  
DEL              Deletes one or more files.  
DIR              Displays a list of files and subdirectories in a directory.  
DISKPART         Displays or configures Disk Partition properties.  
DOSKEY           Edits command lines, recalls Windows commands, and  
                  creates macros.
```

- At the “>” type help
- Over 80 commands will be listed.
- In most cases you will only use about 5-10 of them.

CMD – Help Command

```
c:\> Administrator: Command Prompt
yDISKPART      Displays or configures Disk Partition properties.
DOSKEY        Edits command lines, recalls Windows commands, and
              creates macros.
DRIVERQUERY   Displays current device driver status and properties.
ECHO          Displays messages, or turns command echoing on or off.
ENDLOCAL      Ends localization of environment changes in a batch file.
ERASE         Deletes one or more files.
EXIT          Quits the CMD.EXE program (command interpreter).
FC             Compares two files or sets of files, and displays the
              differences between them.
FIND          Searches for a text string in a file or files.
FINDSTR       Searches for strings in files.
FOR           Runs a specified command for each file in a set of files.
FORMAT        Formats a disk for use with Windows.
FSUTIL        Displays or configures the file system properties.
FTYPE         Displays or modifies file types used in file extension
              associations.
GOTO          Directs the Windows command interpreter to a labeled line in
              a batch program.
GPRESULT     Displays Group Policy information for machine or user.
GRAFTABL    Enables Windows to display an extended character set in
              graphics mode.
HELP          Provides Help information for Windows commands.
ICAcls       Display, modify, backup, or restore ACLs for files and
              directories.
IF            Performs conditional processing in batch programs.
LABEL         Creates, changes, or deletes the volume label of a disk.
MD            Creates a directory.
MKDIR        Creates a directory.
MKLINK       Creates Symbolic Links and Hard Links
```

CMD – Help Command

```
Administrator: Command Prompt

MD           Creates a directory.
MKDIR       Creates a directory.
MKLINK      Creates Symbolic Links and Hard Links
MODE        Configures a system device.
MORE        Displays output one screen at a time.
MOVE        Moves one or more files from one directory to another
            directory.
OPENFILES   Displays files opened by remote users for a file share.
PATH        Displays or sets a search path for executable files.
PAUSE        Suspends processing of a batch file and displays a message.
POPD        Restores the previous value of the current directory saved by
            PUSHD.
PRINT       Prints a text file.
PROMPT     Changes the Windows command prompt.
PUSHD       Saves the current directory then changes it.
RD          Removes a directory.
RECOVER    Recovers readable information from a bad or defective disk.
REM         Records comments (remarks) in batch files or CONFIG.SYS.
REN         Renames a file or files.
RENAME     Renames a file or files.
REPLACE    Replaces files.
RMDIR      Removes a directory.
ROBOCOPY   Advanced utility to copy files and directory trees
SET         Displays, sets, or removes Windows environment variables.
SETLOCAL   Begins localization of environment changes in a batch file.
SC          Displays or configures services (background processes).
SCHTASKS   Schedules commands and programs to run on a computer.
SHIFT      Shifts the position of replaceable parameters in batch files.
SHUTDOWN  Allows proper local or remote shutdown of machine.
SORT       Sorts input.
```

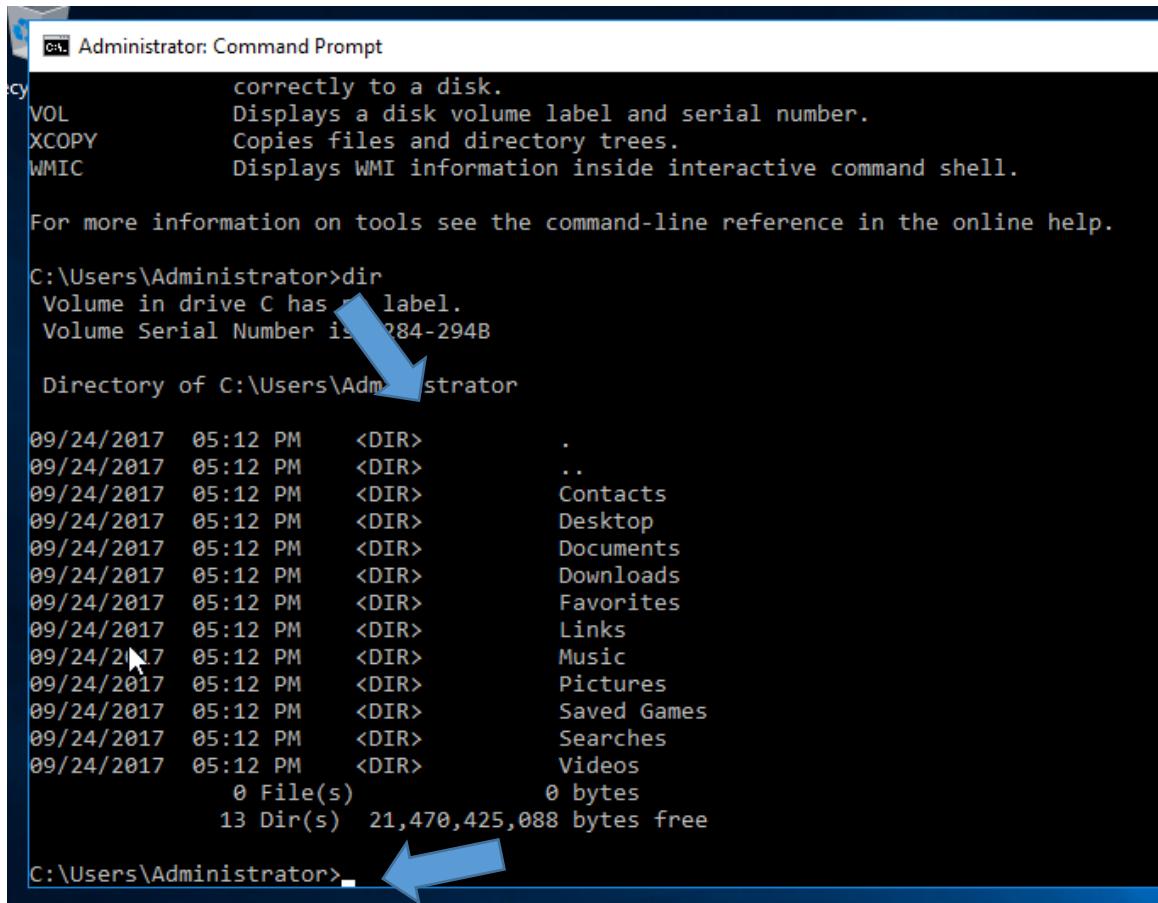
CMD – Help Command

```
Administrator: Command Prompt
RMDIR      Removes a directory.
ROBOCOPY    Advanced utility to copy files and directory trees
SET         Displays, sets, or removes Windows environment variables.
SETLOCAL    Begins localization of environment changes in a batch file.
SC          Displays or configures services (background processes).
SCHTASKS   Schedules commands and programs to run on a computer.
SHIFT       Shifts the position of replaceable parameters in batch files.
SHUTDOWN   Allows proper local or remote shutdown of machine.
SORT        Sorts input.
START       Starts a separate window to run a specified program or command.
SUBST       Associates a path with a drive letter.
SYSTEMINFO  Displays machine specific properties and configuration.
TASKLIST   Displays all currently running tasks including services.
TASKKILL   Kill or stop a running process or application.
TIME        Displays or sets the system time.
TITLE       Sets the window title for a CMD.EXE session.
TREE        Graphically displays the directory structure of a drive or
            path.
TYPE        Displays the contents of a text file.
VER         Displays the Windows version.
VERIFY     Tells Windows whether to verify that your files are written
            correctly to a disk.
VOL         Displays a disk volume label and serial number.
XCOPY       Copies files and directory trees.
WMIC       Displays WMI information inside interactive command shell.

For more information on tools see the command-line reference in the online help.

C:\Users\Administrator>
```

Windows CLI – DIR command



A screenshot of a Windows Command Prompt window titled "Administrator: Command Prompt". The window shows the help information for the DIR command and then lists the contents of the C:\Users\Administrator directory. A blue arrow points from the question text to the command prompt line at the bottom.

```
Administrator: Command Prompt
cy      correctly to a disk.
VOL     Displays a disk volume label and serial number.
XCOPY   Copies files and directory trees.
WMIC    Displays WMI information inside interactive command shell.

For more information on tools see the command-line reference in the online help.

C:\Users\Administrator>dir
Volume in drive C has no label.
Volume Serial Number is 384-294B

Directory of C:\Users\Administrator

09/24/2017  05:12 PM    <DIR>        .
09/24/2017  05:12 PM    <DIR>        ..
09/24/2017  05:12 PM    <DIR>        Contacts
09/24/2017  05:12 PM    <DIR>        Desktop
09/24/2017  05:12 PM    <DIR>        Documents
09/24/2017  05:12 PM    <DIR>        Downloads
09/24/2017  05:12 PM    <DIR>        Favorites
09/24/2017  05:12 PM    <DIR>        Links
09/24/2017  05:12 PM    <DIR>        Music
09/24/2017  05:12 PM    <DIR>        Pictures
09/24/2017  05:12 PM    <DIR>        Saved Games
09/24/2017  05:12 PM    <DIR>        Searches
09/24/2017  05:12 PM    <DIR>        Videos
               0 File(s)          0 bytes
               13 Dir(s)  21,470,425,088 bytes free

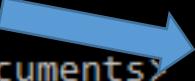
C:\Users\Administrator>
```

- Use the dir command to list the contents of a directory.
- At the > prompt, type “dir”.
- What is listed here?
- Any folders that make sense?
- Why is it 0 File(s) 0 bytes?
- How many directories [Dir(s)] are there?

Windows CLI – CD command

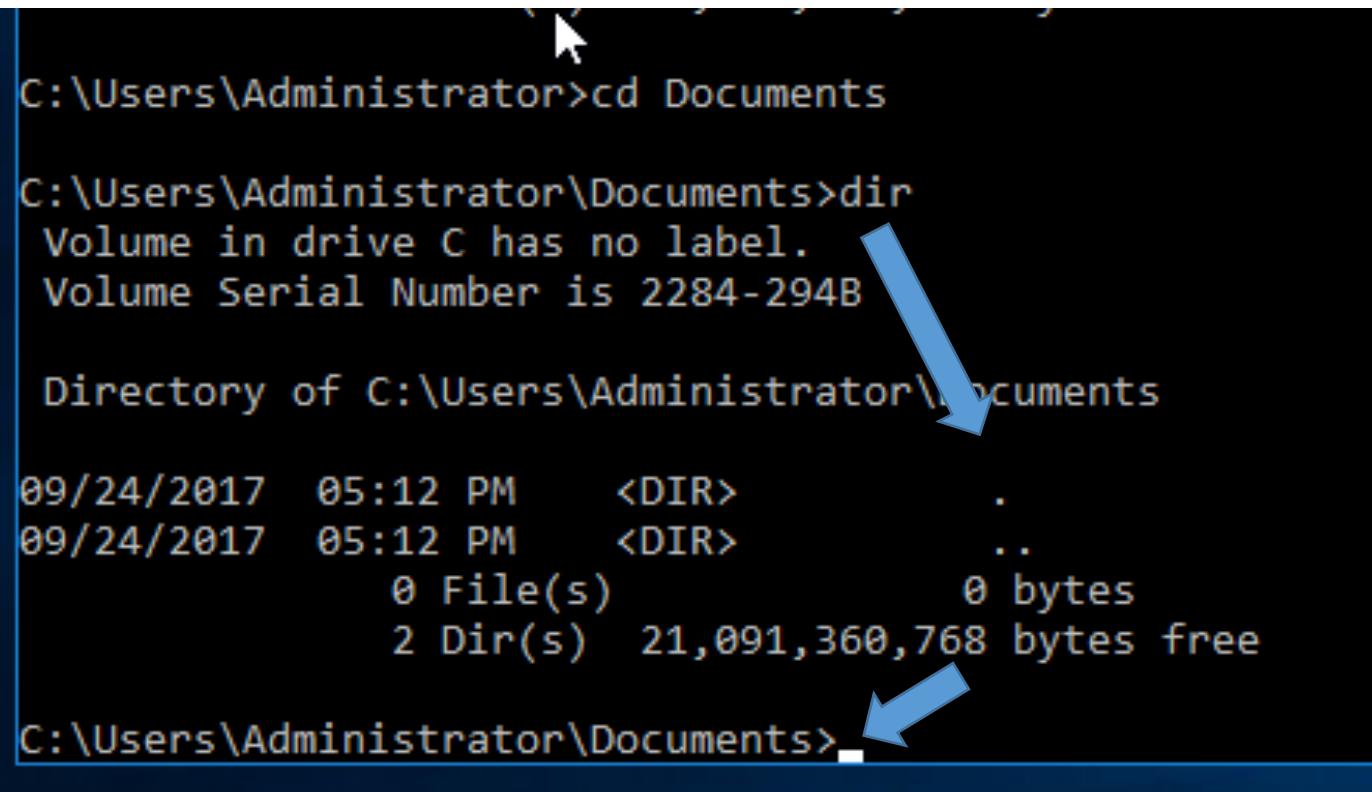
```
09/24/2017  05:12 PM  <DIR>          Searches
09/24/2017  05:12 PM  <DIR>          Videos
              0 File(s)           0 bytes
              13 Dir(s)  21,470,425,088 bytes free

C:\Users\Administrator>cd Documents
C:\Users\Administrator\Documents>
```



- Use the CD command to navigate into directories.
- cd into the “Documents” directory.
- What has changed?
- What can be done here?

Windows CLI – CD command



```
C:\Users\Administrator>cd Documents
C:\Users\Administrator\Documents>dir
Volume in drive C has no label.
Volume Serial Number is 2284-294B

Directory of C:\Users\Administrator\Documents

09/24/2017  05:12 PM    <DIR> .
09/24/2017  05:12 PM    <DIR> ..
              0 File(s)          0 bytes
              2 Dir(s)  21,091,360,768 bytes free

C:\Users\Administrator\Documents>
```

The screenshot shows a Windows Command Prompt window. The user has navigated to the 'Documents' directory under their user account. They then run the 'dir' command to list the contents of the directory. The output shows two sub-directories ('.' and '..') and some disk statistics. A blue arrow points from the question text below to the directory listing, and another blue arrow points from the question text to the command prompt's status bar at the bottom.

- Run the dir command in this directory.
- What can be seen?
- How many files are there?
- How many directories are there?

Windows CLI – [.] – Current Directory

```
C:\Users\Administrator>cd Documents  
  
C:\Users\Administrator\Documents>dir  
Volume in drive C has no label.  
Volume Serial Number is 2284-294B  
  
Directory of C:\Users\Administrator\Documents  
  
09/24/2017  05:12 PM    <DIR>          .  
09/24/2017  05:12 PM    <DIR>          ..  
                  0 File(s)           0 bytes  
                  2 Dir(s)  21,091,360,768 bytes free  
  
C:\Users\Administrator\Documents>cd .  
  
C:\Users\Administrator\Documents>
```

- It seems that the “.” is a directory.
- Lets cd into it.
- Type “cd .”
- Any change?
- What is the purpose of the “.” directory then?
- Will see this later on.

Windows CLI – [..] – Parent Directory

The screenshot shows two instances of the Windows Command Prompt. The left window shows the current directory as C:\Users\Administrator\Documents. The user types 'cd .' and then 'cd ..'. The right window shows the current directory as C:\Users\Administrator. The user types 'dir' to list the contents of the current directory. Blue arrows indicate the flow from the left window to the right window, corresponding to the sequence of commands entered.

```
Volume Serial Number is 2284-294B

Directory of C:\Users\Administrator\Documents
09/24/2017  05:12 PM    <DIR>    .
09/24/2017  05:12 PM    <DIR>    ..
09/24/2017  05:12 PM      0 File(s)   0 bytes
09/24/2017  05:12 PM    2 Dir(s)  21,091,360,768 bytes free

C:\Users\Administrator\Documents>cd .

C:\Users\Administrator\Documents>cd ..

C:\Users\Administrator>
```



```
C:\Users\Administrator\Documents>cd .

C:\Users\Administrator\Documents>cd ..

>dir
Volume in drive C has no label.
Volume Serial Number is 2284-294B

Directory of C:\Users\Administrator
09/24/2017  05:12 PM    <DIR>    .
09/24/2017  05:12 PM    <DIR>    ..
09/24/2017  05:12 PM    <DIR>    Contacts
09/24/2017  05:12 PM    <DIR>    Desktop
09/24/2017  05:12 PM    <DIR>    Documents
09/24/2017  05:12 PM    <DIR>    Downloads
09/24/2017  05:12 PM    <DIR>    Favorites
09/24/2017  05:12 PM    <DIR>    Links
09/24/2017  05:12 PM    <DIR>    Music
09/24/2017  05:12 PM    <DIR>    Pictures
09/24/2017  05:12 PM    <DIR>    Saved Games
09/24/2017  05:12 PM    <DIR>    Searches
09/24/2017  05:12 PM    <DIR>    Videos
09/24/2017  05:12 PM      0 File(s)   0 bytes
13 Dir(s)  20,400,103,424 bytes free

C:\Users\Administrator>
```

- There is another directory called “..”.
- Type “..” At the command prompt.
- What happened?
- Did the directory changed?
- Type “dir” at the command prompt.
- Anything familiar?
- The “..” is the parent directory.
- Changing into this directory will take you to the parent of the current directory.

CD .. To the root

```
09/24/2017  05:12 PM    <DIR>          Videos
                  0 File(s)           0 bytes
                 13 Dir(s)  20,400,103,424 bytes free

C:\Users\Administrator>cd ..

C:\Users>cd ..

C:\>cd ..

C:\>
```

- Keep typing “cd ..” till the path doesn’t change anymore.
- We are now at the root of the drive.
- What is located here?
- We will find out later.

Windows CLI – Absolute Paths

```
09/24/2017  05:12 PM    <DIR>          Searches
09/24/2017  05:12 PM    <DIR>          Videos
                  0 File(s)           0 bytes
                 13 Dir(s)  20,400,103,424 bytes free

C:\Users\Administrator>cd ..

C:\Users>cd ..

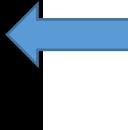
C:\>cd ..

C:\>cd c:\Users\Administrator\Documents ←
c:\Users\Administrator\Documents> ←
```

- Lets go straight to the Documents folder.
- Type “**cd C:\Users\Administrator\Documents**”
- We are back to the Documents folder.
- We used an absolute path to get there.
- No matter where we are in the directory structure, once we enter an absolute path (once it exists, and access is permitted) we will reach there.

Windows CLI – Absolute Paths

```
C:\Users\Administrator>cd ..  
C:\Users>cd ..  
C:\>cd ..  
C:\>cd c:\Users\Administrator\Documents  
c:\Users\Administrator\Documents>cd C:\Users\Public\Downloads  
c:\Users\Public\Downloads>-
```



- Try the absolute paths for other folders, type “cd C:\Users\Public\Downloads”.
- Did it work?
- What does this mean?
 - There is a user’s folder called Public with a Downloads folder in it.

Windows CLI – Relative Paths

```
C:\Users\Administrator>cd ..  
C:\Users>cd ..  
C:\>cd ..  
C:\>cd c:\Users\Administrator\Documents  
c:\Users\Administrator\Documents>cd C:\Users\Public\Downloads  
C:\Users\Public\Downloads>cd ..\..\Administrator\Documents  
C:\Users\Administrator\Documents>
```



- Navigate back to the Administrator's Documents folder using:
 - “cd ..\..\Administrator\Documents”
- Why did this work?
- Two things happened here:
 1. Each “cd ..” is one parent folder up. Another “cd ..” is another parent folder up, etc.
 2. Administrator and Public should be in the same folder, once you reach there, it is a matter of navigating in the sub folder Administrator then the subfolder Documents.
- This is using relative paths.
- To use relative paths it is good to have an idea of your folder structure.

Windows CLI – Tree command

```
C:\Users\Administrator\Documents>tree /?
Graphically displays the folder structure of a drive or path.

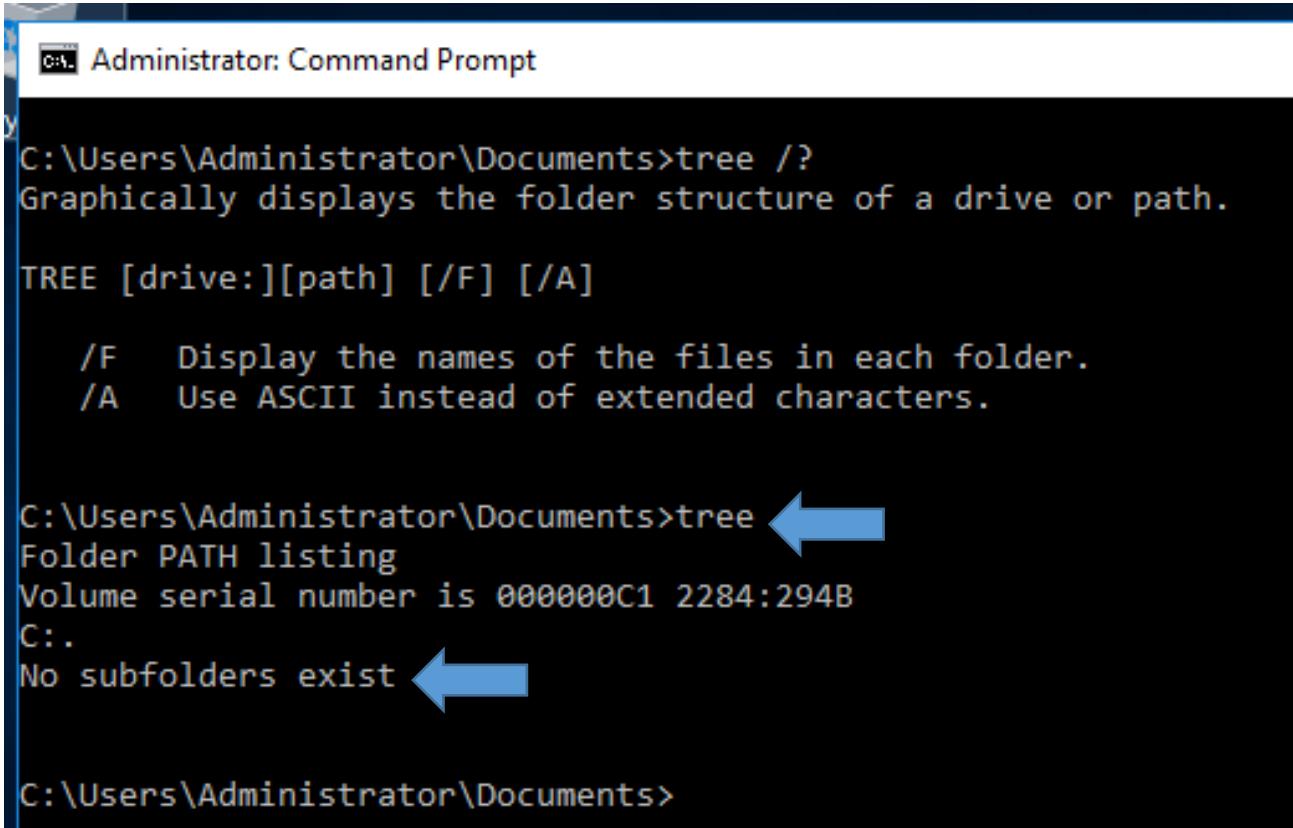
TREE [drive:][path] [/F] [/A]

/F   Display the names of the files in each folder.
/A   Use ASCII instead of extended characters.

C:\Users\Administrator\Documents>
```

- How can we get an idea of our folder structure?
- Can either **cd** and **dir** each folder and write it out or
- Use the **tree** command.
- Execute the command “**tree /?**”.
 - The **/?** or help command list the parameters that can be used for whatever command you are using.

Windows CLI – Tree command



Administrator: Command Prompt

```
C:\Users\Administrator\Documents>tree /?
Graphically displays the folder structure of a drive or path.

TREE [drive:][path] [/F] [/A]

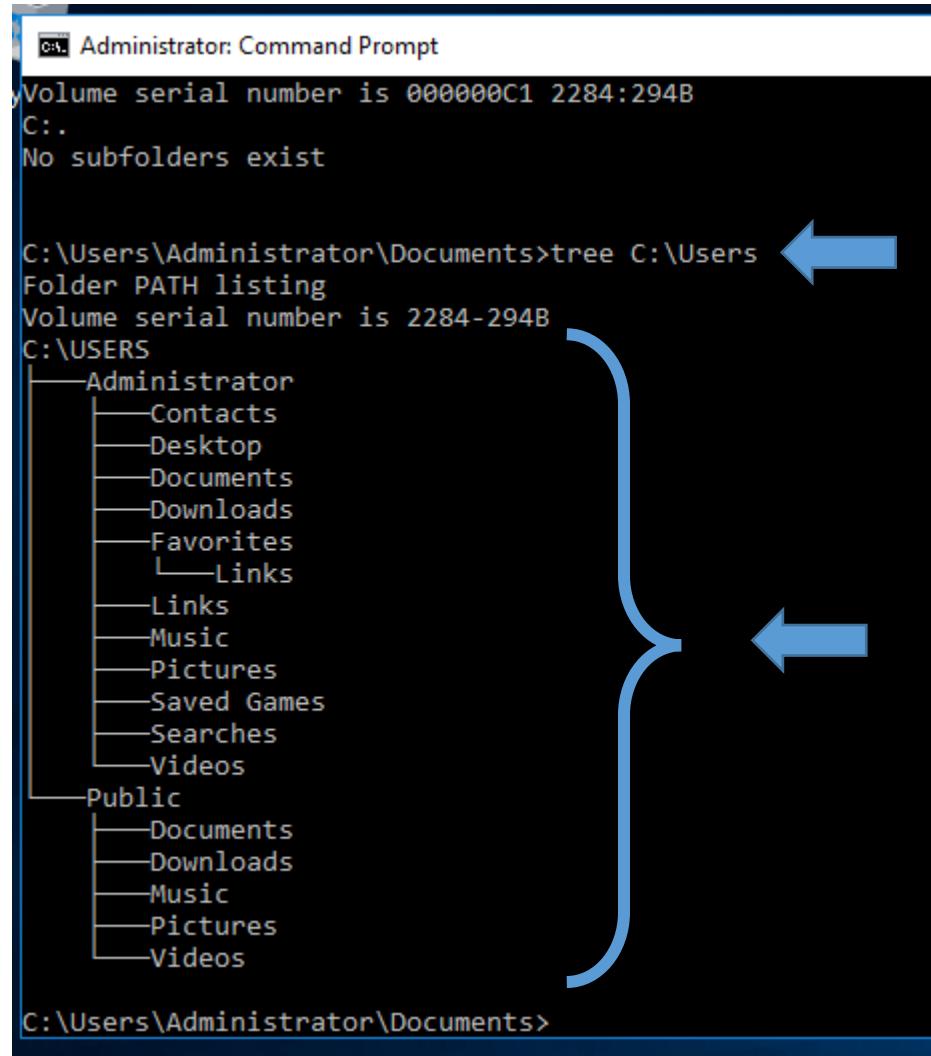
/F   Display the names of the files in each folder.
/A   Use ASCII instead of extended characters.

C:\Users\Administrator\Documents>tree ←
Folder PATH listing
Volume serial number is 000000C1 2284:294B
C:.
No subfolders exist ←

C:\Users\Administrator\Documents>
```

- Execute the command “tree”.
- No subfolders exist.
 - Why is this the case?
 - It is correct.

Windows CLI – Tree command



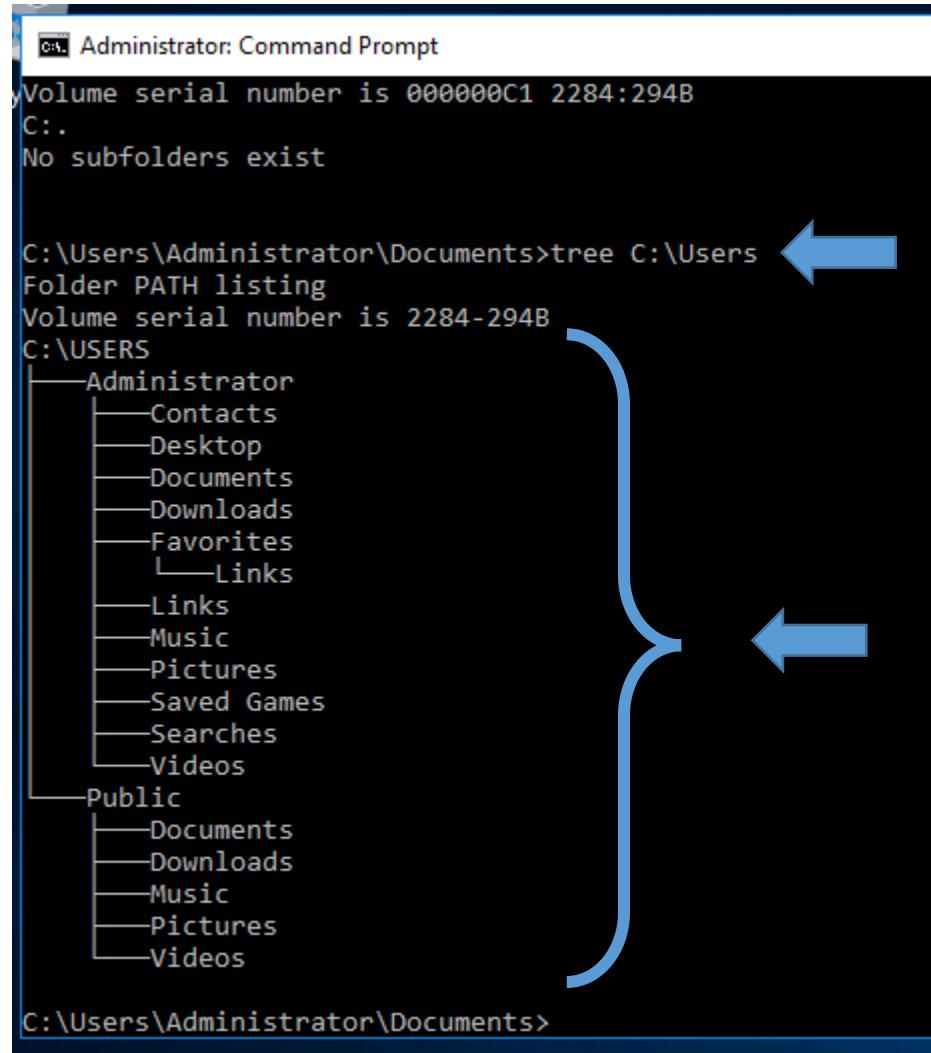
```
Administrator: Command Prompt
Volume serial number is 000000C1 2284:294B
C:.
No subfolders exist

C:\Users\Administrator\Documents>tree C:\Users
Folder PATH listing
Volume serial number is 2284-294B
C:\USERS
    Administrator
        Contacts
        Desktop
        Documents
        Downloads
        Favorites
            Links
        Links
        Music
        Pictures
        Saved Games
        Searches
        Videos
    Public
        Documents
        Downloads
        Music
        Pictures
        Videos

C:\Users\Administrator\Documents>
```

- Try the command “**tree C:\Users**”.
- What do we get?
- Anything familiar?
- We can see the tree structure of the C:\Users folder.
- Try this with other folders.

Windows CLI – Tree command



```
Administrator: Command Prompt
Volume serial number is 000000C1 2284:294B
C:.
No subfolders exist

C:\Users\Administrator\Documents>tree C:\Users
Folder PATH listing
Volume serial number is 2284-294B
C:\USERS
    Administrator
        Contacts
        Desktop
        Documents
        Downloads
        Favorites
            Links
        Links
        Music
        Pictures
        Saved Games
        Searches
        Videos
    Public
        Documents
        Downloads
        Music
        Pictures
        Videos

C:\Users\Administrator\Documents>
```

- Try the command “**tree C:\Users**”.
- What do we get?
- Anything familiar?
- We can see the tree structure of the C:\Users folder.
- Try this with other folders.
 - This will take a while;
 - Execute the command “**tree C:**”.
 - What happened here?
- The “**tree C:**” command showed the directory structure of the entire file system.
 - It is a lot of folder and would not make sense to use it now.
 - Keep it simple.

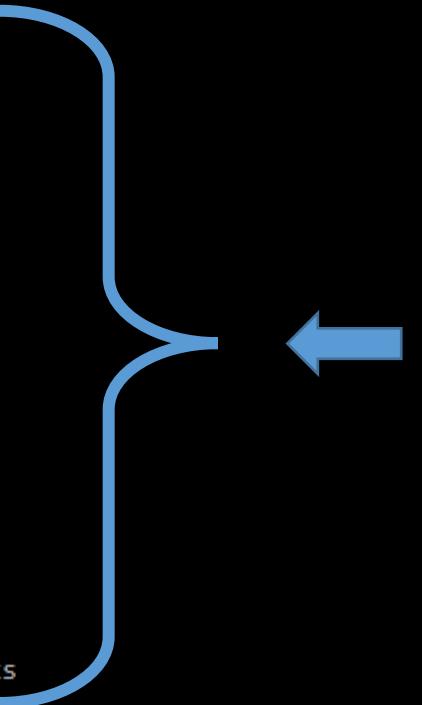
Windows CLI – md (mkdir)

```
C:\ Administrator: Command Prompt  
C:\Users\Administrator\Documents>md folder1 ←  
C:\Users\Administrator\Documents>
```

```
C:\ Administrator: Command Prompt  
y  
C:\Users\Administrator\Documents>md folder1  
C:\Users\Administrator\Documents>dir ←  
Volume in drive C has no label.  
Volume Serial Number is 2284-294B  
  
Directory of C:\Users\Administrator\Documents  
  
09/24/2017  09:31 PM    <DIR>        .  
09/24/2017  09:31 PM    <DIR>        ..  
09/24/2017  09:31 PM    <DIR>        folder1 ←  
          0 File(s)           0 bytes  
          3 Dir(s)  19,258,134,528 bytes free  
  
C:\Users\Administrator\Documents>_
```

- To create a directory use the **md** or **mkdir** command with parameters.
- Execute the command “**md folder1**”.
- To see if it was created, enter the “**dir**” command.
 - As you can see the folder was created.

Windows CLI – md (mkdir)



```
Administrator: Command Prompt
y
09/24/2017 09:31 PM <DIR> .
09/24/2017 09:31 PM <DIR> ..
09/24/2017 09:31 PM <DIR> folder1
    0 File(s)          0 bytes
    3 Dir(s) 19,258,134,528 bytes free

C:\Users\Administrator\Documents>md folder2
C:\Users\Administrator\Documents>md groceries
C:\Users\Administrator\Documents>md car
C:\Users\Administrator\Documents>md games
C:\Users\Administrator\Documents>cd folder2
C:\Users\Administrator\Documents\folder2>md archives1
C:\Users\Administrator\Documents\folder2>md archives2
C:\Users\Administrator\Documents\folder2>cd archives1
C:\Users\Administrator\Documents\folder2\archives1>md maps
C:\Users\Administrator\Documents\folder2\archives1>md gps
C:\Users\Administrator\Documents\folder2\archives1>md tracks
C:\Users\Administrator\Documents\folder2\archives1>
```

- Create a few more folders:
 - “**md folder2**”
 - “**md groceries**”
 - “**md car**”
 - “**md games**”
- Create some sub folders
 - “**cd folder2**”
 - “**md archives1**”
 - “**md archives2**”
 - “**cd archives1**”
 - “**md maps**”
 - “**md gps**”
 - “**md tracks**”

Windows CLI – md (mkdir)

A screenshot of a Windows Command Prompt window titled "Administrator: Command Prompt". The command entered is "md tracks" at the prompt "C:\Users\Administrator\Documents\folder2\archives1>". The output shows the creation of the "tracks" directory. Below this, the command "tree C:\Users\Administrator" is run, resulting in a detailed folder listing for the "Administrator" user's root directory. The listing includes subfolders like "Contacts", "Desktop", "Documents", "Downloads", "Favorites", "Links", "Music", "Pictures", "Saved Games", "Searches", and "Videos", along with specific files like "car", "gps", "maps", and "archives1". A blue curly brace on the left side groups the "Documents" section, and two blue arrows point from the brace towards the "tracks" command in the history.

```
C:\Users\Administrator\Documents\folder2\archives1>md tracks
C:\Users\Administrator\Documents\folder2\archives1>tree C:\Users\Administrator
Folder PATH listing
Volume serial number is 2284-294B
C:\USERS\ADMINISTRATOR
    Contacts
    Desktop
    Documents
        car
        folder1
        folder2
            archives1
                gps
                maps
                tracks
            archives2
        games
        groceries
    Downloads
    Favorites
        Links
    Links
    Music
    Pictures
    Saved Games
    Searches
    Videos
C:\Users\Administrator\Documents\folder2\archives1>
```

- What does his look like?
- Execute the command “**tree C:\Users\Administrator**”.
- Did it look as it was expected to be created?

Windows CLI – rd

```
C:\Administrator: Command Prompt  
yC:\Users\Administrator\Documents\folder2\archives1>cd ..  
C:\Users\Administrator\Documents\folder2>rd archives2  
C:\Users\Administrator\Documents\folder2>dir  
Volume in drive C has no label.  
Volume Serial Number is 2284-294B  
  
Directory of C:\Users\Administrator\Documents\folder2  
  
09/25/2017 08:31 AM <DIR> .  
09/25/2017 08:31 AM <DIR> ..  
09/24/2017 09:39 PM <DIR> archives1 ←  
    0 File(s)          0 bytes  
    3 Dir(s) 19,256,168,448 bytes free  
  
C:\Users\Administrator\Documents\folder2>tree C:\Users\Administrator ←  
Folder PATH listing  
Volume serial number is 2284-294B  
C:\USERS\ADMINISTRATOR  
|--Contacts  
|--Desktop  
|--Documents  
|   |--car  
|   |--folder1  
|   |--folder2  
|       |--archives1  
|           |--gps  
|           |--maps  
|       |--games  
|       |--groceries  
|       |--Downloads  
|       |--tracks
```

- Move to the parent directory, “cd ..”.
- Remove the **archives2** folder using the command, “rd **archives2**”.
- Perform the “dir” and “tree C:\Users\Administrator” commands to see if the folder was removed.

Windows CLI – rd

The screenshot shows a Windows Command Prompt window titled "Administrator: Command Prompt". The command "rd archives1" is entered, but the directory is not empty, so the command fails. A blue arrow points from the question mark in the error message to the help command "rd /?". The help output shows options for removing directories, including "/S" which removes files and subdirectories. Another blue arrow points from the "/S" option in the help output to the successful execution of "rd /S archives1". A third blue arrow points from the confirmation prompt "Are you sure (Y/N)? y" to the final "dir" command, which shows the directory is now empty.

```
C:\Users\Administrator\Documents\folder2>rd archives1
The directory is not empty.

C:\Users\Administrator\Documents\folder2>rd /?
Removes (deletes) a directory.

RMDIR [/S] [/Q] [drive:]path
RD [/S] [/Q] [drive:]path

    /S      Removes all directories and files in the specified directory
           in addition to the directory itself. Used to remove a directory
           tree.

    /Q      Quiet mode, do not ask if ok to remove a directory tree with /S

C:\Users\Administrator\Documents\folder2>rd /S archives1
archives1, Are you sure (Y/N)? y

C:\Users\Administrator\Documents\folder2>dir
Volume in drive C has no label.
Volume Serial Number is 2284-294B

Directory of C:\Users\Administrator\Documents\folder2

09/25/2017  08:42 AM    <DIR>        .
09/25/2017  08:42 AM    <DIR>        ..
              0 File(s)          0 bytes
              2 Dir(s)  19,256,164,352 bytes free

C:\Users\Administrator\Documents\folder2>
```

- Remove the **archives1** folder by issuing the “**rd archives1**” command.
- Did it work?
- How can this be resolved?
- Execute the command “**rd /?**” to see possible options.
 - The **/S** option looks promising.
- Execute the command “**rd /S archives1**”.
- Type “**y**”, press enter.
- Enter the “**dir**” command.
- Was the folder removed?

Windows CLI – move

A screenshot of a Windows Command Prompt window titled "Administrator: Command Prompt". The window shows the following text:

```
Administrator: Command Prompt
y              2 Dir(s)  19,256,164,352 bytes free
C:\Users\Administrator\Documents\folder2>cd ..
C:\Users\Administrator\Documents>move car folder1
    1 dir(s) moved.

C:\Users\Administrator\Documents>tree C:\Users\Administrator
Folder PATH listing
Volume serial number is 2284-294B
C:\USERS\ADMINISTRATOR
    Contacts
    Desktop
    Documents
        folder1
            car
        folder2
        games
        groceries
    Downloads
    Favorites
        Links
    Links
    Music
    Pictures
    Saved Games
    Searches
    Videos

C:\Users\Administrator\Documents>
```

The command "move car folder1" has been highlighted with blue arrows pointing to the "cd .." command above it and the "car" folder name. A large blue curly brace is positioned to the left of the "Documents" directory, grouping all the subfolders under it.

- Move to the parent directory “`cd ..`”.
- Move the **car** folder into **folder1** by issuing the command “`move car folder1`”.
- Did it work?
- Perform the “`dir`” and “`tree C:\Users\Administrator`” commands to see if the folder was moved.

Windows CLI – del

The screenshot shows a Windows Command Prompt window titled "Administrator: Command Prompt". The command "del games" is entered, followed by a confirmation prompt "Are you sure (Y/N)?". The user types "y" and presses Enter. A blue arrow points from the confirmation prompt to the "y" key. The command "dir" is then run to show the directory listing. A blue arrow points from the "dir" command to the "games" folder in the list. The directory listing includes "games" and "groceries" folders, along with other files and folders like "folder1" and "folder2". The prompt "C:\Users\Administrator\Documents>" is visible at the bottom.

```
C:\Users\Administrator\Documents>del games
C:\Users\Administrator\Documents\games\*, Are you sure (Y/N)? y ←
C:\Users\Administrator\Documents>dir ←
Volume in drive C has no label.
Volume Serial Number is 2284-294B

Directory of C:\Users\Administrator\Documents

09/25/2017  09:03 AM    <DIR>        .
09/25/2017  09:03 AM    <DIR>        ..
09/25/2017  09:03 AM    <DIR>        folder1
09/25/2017  08:42 AM    <DIR>        folder2
09/24/2017  09:38 PM    <DIR>        games ←
09/24/2017  09:38 PM    <DIR>        groceries
                           0 File(s)   0 bytes
                           6 Dir(s)  19,255,607,296 bytes free

C:\Users\Administrator\Documents>
```

- In your current folder “\Documents” perform the del operation on the games folder.
- Execute the command “del games”.
- Type “Y”, then enter.
- Perform the “dir” command to see if the folder was deleted.
- In this case it wasn’t deleted.
 - You would notice a “*” in the prompt to confirm.
 - Will come back to this later on.

Windows Directories

```
0 File(s)          0 bytes
6 Dir(s) 19,255,607,296 bytes free

C:\Users\Administrator\Documents>dir c:\ ←
Volume in drive C has no label.
Volume Serial Number is 2284-294B

Directory of c:\

07/16/2016  09:23 AM    <DIR>          PerfLogs
09/24/2017  05:12 PM    <DIR>          Program Files
07/16/2016  09:23 AM    <DIR>          Program Files (x86)
09/24/2017  05:12 PM    <DIR>          Users
09/24/2017  05:11 PM    <DIR>          Windows
                           0 File(s)          0 bytes
                           5 Dir(s) 19,253,723,136 bytes free

C:\Users\Administrator\Documents>
```

- View the directories in the root drive.
- Execute the command “**dir c:**”.
- Common folders are:
 - **PerfLogs**
 - contains performance logs
 - **Program Files**
 - Contains all installed applications
 - **Program Files (x86)**
 - Contains all 32-bit installed applications
 - **Users**
 - Contains the user profiles, documents etc.
 - **Windows**
 - Contains the operating system files

Windows Directories – Additional folders

```
Administrator: Command Prompt
y 09/24/2017 05:12 PM <DIR> Program Files
07/16/2016 09:23 AM <DIR> Program Files (x86)
09/24/2017 05:12 PM <DIR> Users
09/24/2017 05:11 PM <DIR> Windows
      0 File(s)          0 bytes
      5 Dir(s) 19,253,723,136 bytes free

C:\Users\Administrator\Documents>dir /A c:\ ←
Volume in drive C has no label.
Volume Serial Number is 2284-294B

Directory of c:\

09/24/2017 05:12 PM <DIR> $Recycle.Bin
07/16/2016 09:18 AM 384,322 bootmgr
07/16/2016 09:18 AM 1 BOOTNXT
09/24/2017 08:09 PM <JUNCTION> Documents and Settings [C:\Users]
09/24/2017 05:13 PM 1,342,177,280 pagefile.sys
07/16/2016 09:23 AM <DIR> PerfLogs
09/24/2017 05:12 PM <DIR> Program Files
07/16/2016 09:23 AM <DIR> Program Files (x86)
09/24/2017 05:10 PM <DIR> ProgramData
09/24/2017 08:10 PM <DIR> Recovery
09/24/2017 08:09 PM <DIR> System Volume Information
09/24/2017 05:12 PM <DIR> Users
09/24/2017 05:11 PM <DIR> Windows
      3 File(s) 1,342,561,603 bytes
     10 Dir(s) 19,253,719,040 bytes free
} ←
C:\Users\Administrator\Documents>
```

- Execute the command “**dir /A c:**”.
- Additional folders are:
 - **\$Recycle.Bin**
 - Recycle bin files
 - **Documents and Settings**
 - A junction point to C:\Users,
 - legacy use e.g. for Windows 2000, XP
 - **ProgramData**
 - Contains application specific configurations for the system for all users.
 - Windows start menu.
 - **Recovery**
 - Windows recovery environment.
 - Used by system recovery.
 - **System Volume Information**
 - Contains previous versions of files.
 - Snapshots. Used by system restore.

Change to another drive

```
09/24/2017  05:11 PM    <DIR>          Windows
                  3 File(s)   1,342,561,603 bytes
                  10 Dir(s)   19,253,719,040 bytes free

C:\Users\Administrator\Documents>D: ←

D:\>dir ←
Volume in drive D is SSS_X64FREE_EN-US_DV9
Volume Serial Number is D117-46BF

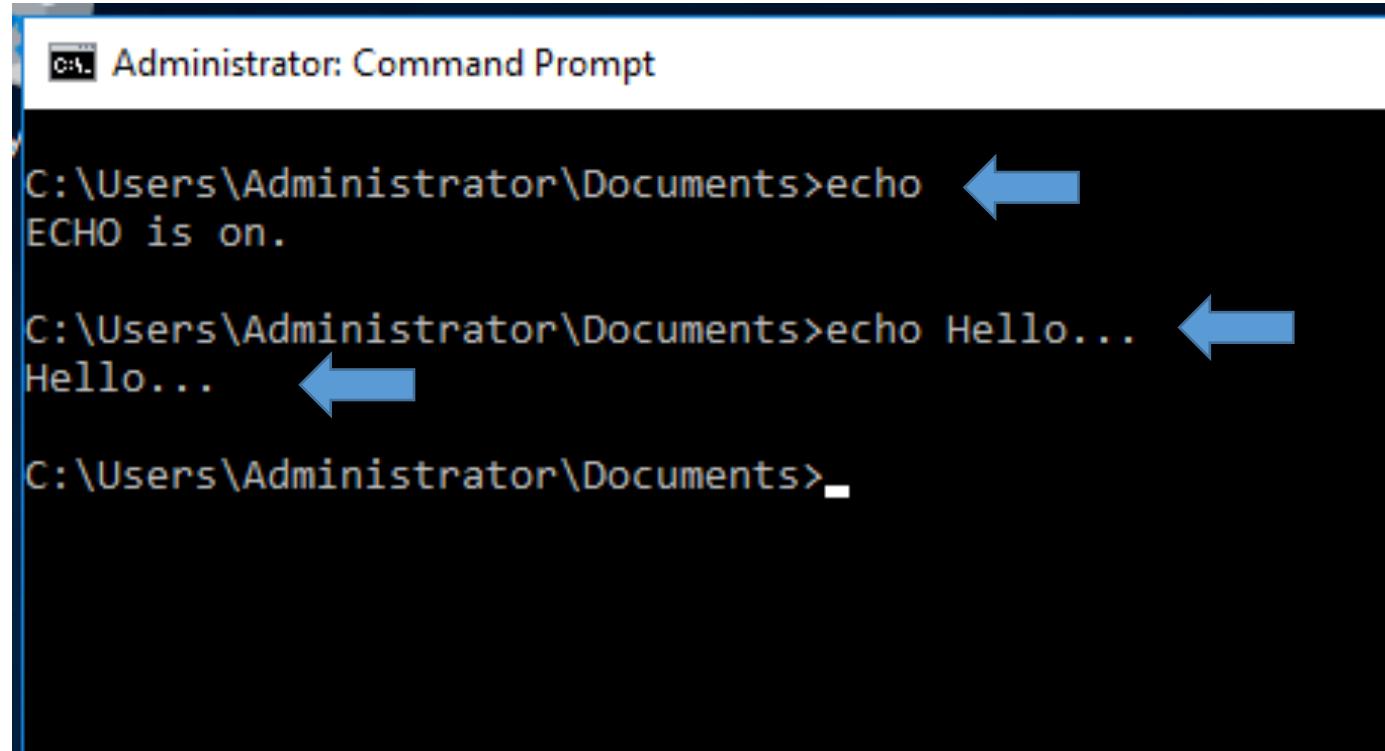
Directory of D:\ ←

09/13/2016  12:52 AM    <DIR>          NanoServer
05/25/2016  05:52 PM          128 autorun.inf
10/13/2016  04:13 PM    <DIR>          boot
07/16/2016  02:23 AM          386,976 bootmgr
07/15/2016  11:06 PM          1,168,736 bootmgr.efi
10/13/2016  04:13 PM    <DIR>          efi
07/15/2016  10:52 PM          80,576 setup.exe
01/10/2017  01:08 PM    <DIR>          sources
10/13/2016  04:13 PM    <DIR>          support
                  4 File(s)   1,636,416 bytes
                  5 Dir(s)           0 bytes free

D:\> ←
```

- To change to another drive letter type the letter followed by the colon then press enter:
 - For example Execute the command “D:”.
- To view the contents, type “dir”.
- In this case it is the Windows Server 2016 installation DVD.

Windows CLI Intro - echo



A screenshot of a Windows Command Prompt window titled "Administrator: Command Prompt". The window shows the following interaction:

```
C:\Users\Administrator\Documents>echo ECHO is on.  
ECHO is on.  
C:\Users\Administrator\Documents>echo Hello...  
Hello...  
C:\Users\Administrator\Documents>-
```

Two blue arrows point to the command "echo" in each line of the output, highlighting its use.

- Execute the command “echo”.
- Execute the command “echo Hello...”.
- It repeats what was typed as a parameter back to the screen. It can be redirected for debugging purposes.

Windows CLI Intro - REM

```
Administrator: Command Prompt  
C:\Users\Administrator\Documents>echo  
ECHO is on.  
C:\Users\Administrator\Documents>echo Hello...  
Hello...  
C:\Users\Administrator\Documents>rem ←  
C:\Users\Administrator\Documents>rem This is a comment... ←  
C:\Users\Administrator\Documents>:: This is also a comment.... ←  
C:\Users\Administrator\Documents>-
```

- Execute the command “rem”.
- Execute the command “rem **This is a comment...**”.
- The rem command are for comments. Anything after the rem command is ignored. It’s not even displayed back to the screen.
- Execute the command “:: **This is also a comment...**”
- The “::” is also a comment statement.

Windows CLI Intro - @

```
C:\Users\Administrator\Documents>rem  
C:\Users\Administrator\Documents>rem This is a comment...  
C:\Users\Administrator\Documents>:: This is also a comment...  
C:\Users\Administrator\Documents>@ ←  
C:\Users\Administrator\Documents>@ rem This is a comment.... ←  
C:\Users\Administrator\Documents>-
```

- Execute the command “@”.
- In most cases the “@” doesn’t do much unless it is used in a batch file.
- It hides the commands from being displayed in the batch file.

Windows CLI Intro - find

```
C:\Users\Administrator\Documents>find /?
Searches for a text string in a file or files.

FIND [/V] [/C] [/N] [/I] [/OFF[LINE]] "string" [[drive:][path]filename[ .. ]]

/V      Displays all lines NOT containing the specified string.
/C      Displays only the count of lines containing the string.
/N      Displays line numbers with the displayed lines.
/I      Ignores the case of characters when searching for the string.
/OFF[LINE] Do not skip files with offline attribute set.
"string" Specifies the text string to find.
[drive:][path]filename
          Specifies a file or files to search.

If a path is not specified, FIND searches the text typed at the prompt
or piped from another command.

C:\Users\Administrator\Documents>find "Admin"
Administrator
Administrator
admin
File
Adminis
Adminis
^C
C:\Users\Administrator\Documents>
```

- Execute the command “**find /?**”.
- Can be used to display results matching the search parameters.
- Execute the command “**find Admin**”.
- Then enter the following:
 - Administrator
 - Admin
 - File
 - Adminis
- Any string that matches **Admin** is displayed.
- Press “**Ctrl + C**” to break out of the find.
- **find** is a powerful tool and will be used later on.

Windows CLI Intro - |

```
Administrator
^C
C:\Users\Administrator\Documents>dir c:\Users | find "Admin"
09/24/2017  05:12 PM    <DIR>          Administrator ←
C:\Users\Administrator\Documents>
```

- The pipe (|) command is used to send output from one stream to another for processing. It cannot be used on its own but with other utilities.
- Execute the command ‘**dir c:\Users | find “Admin”**’.
 - What is the result?
 - What happened here?
- The output of the **dir** command was piped to the **find** command, which then matched all lines with the string “Admin”.

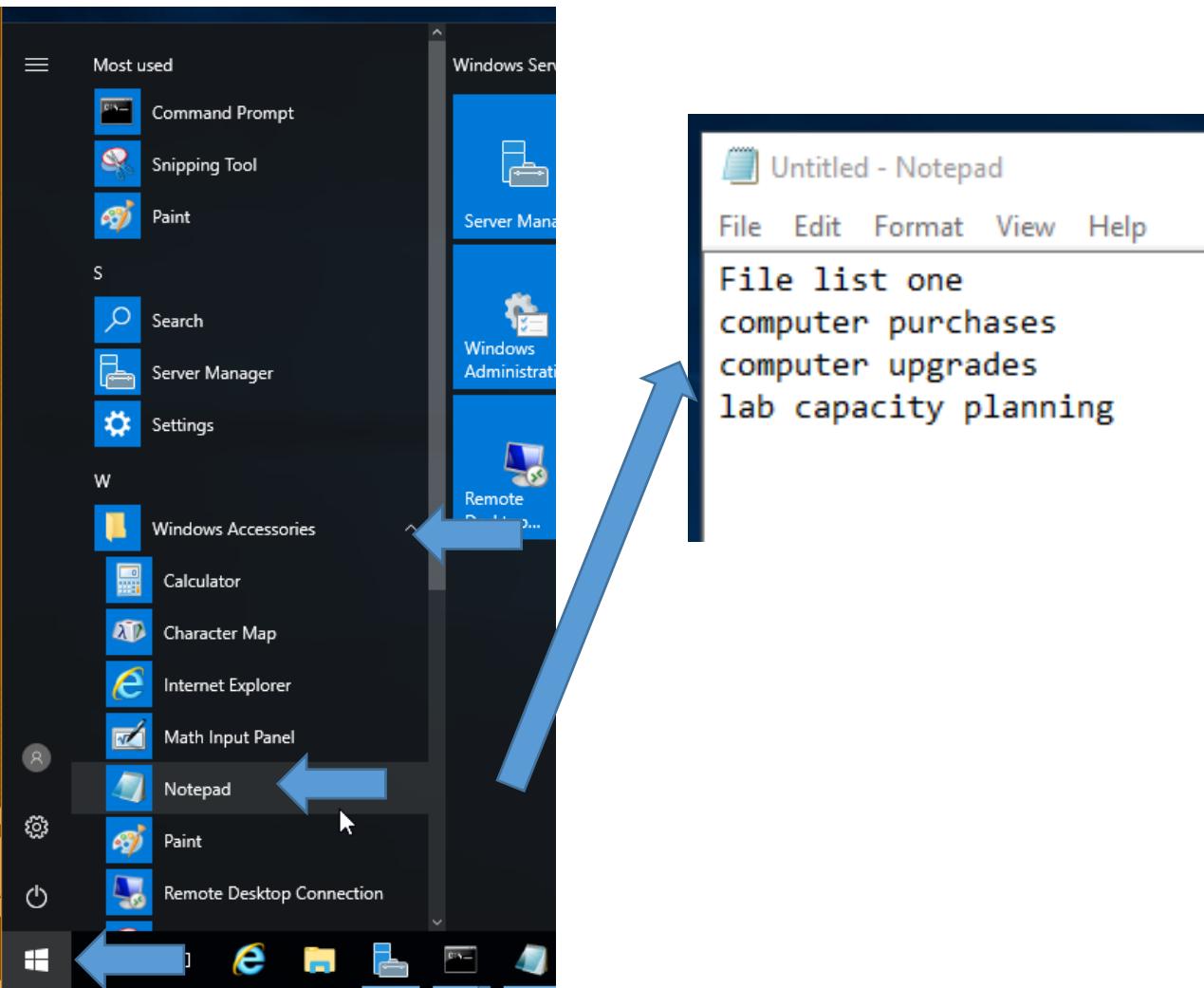
Windows CLI Intro - |

```
Adminis
Adminis
^C
C:\Users\Administrator\Documents>dir c:\Users | find "Admin"
09/24/2017  05:12 PM      <DIR>          Administrator

C:\Users\Administrator\Documents>echo Administrator comments | find "Admin" ←
Administrator comments ←
C:\Users\Administrator\Documents>
```

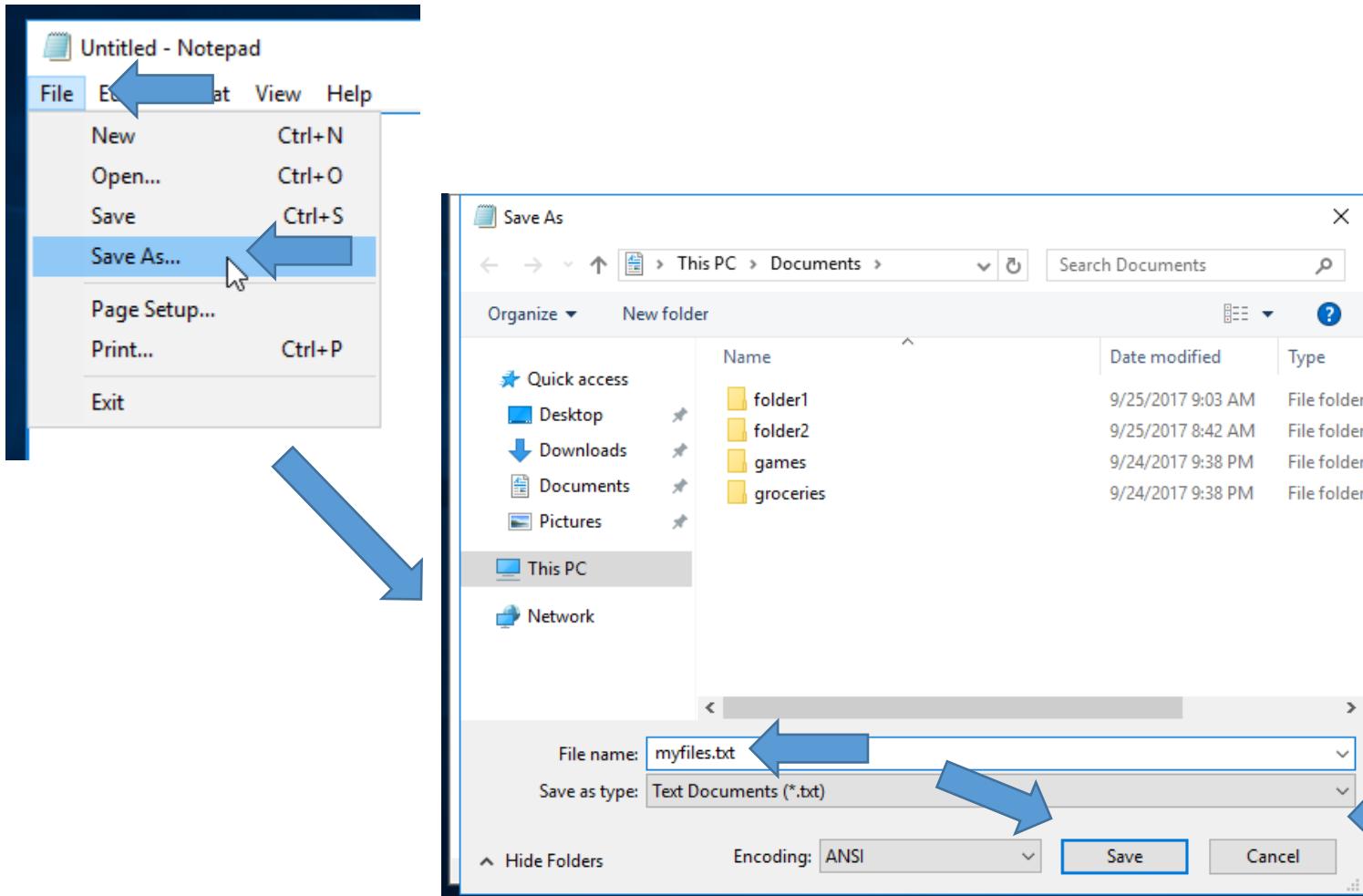
- Once you can get an output, you can pipe it to another program.
- Execute the command ‘**echo Administrator comments | find “Admin”**’.
- The **find** statement will display the line which matches “Admin”.

Windows CLI Intro - type



- Open notepad from the start menu, Expand “**Windows Accessories**”, click **notepad**.
- Using **notepad**, and enter the following text:
 - File list one
 - Computer purchases
 - Computer upgrades
 - Lab capacity planning

Windows CLI Intro - type



- Save the document as “**myfiles.txt**” in the **Documents** folder.
- Click “**File**” → Click “**Save As..**” → enter “**myfiles.txt**” → Click “**Save**”.

Windows CLI Intro - type

```
C:\Users\Administrator\Documents>dir ←
Volume in drive C has no label.
Volume Serial Number is 2284-294B

Directory of C:\Users\Administrator\Documents

09/25/2017  08:00 PM    <DIR>        .
09/25/2017  08:00 PM    <DIR>        ..
09/25/2017  09:03 AM    <DIR>        folder1
09/25/2017  08:42 AM    <DIR>        folder2
09/24/2017  09:38 PM    <DIR>        games
09/24/2017  09:38 PM    <DIR>        groceries
09/25/2017  08:00 PM           75 myfiles.txt ←
                           1 File(s)      75 bytes
                           6 Dir(s)  19,253,207,040 bytes free

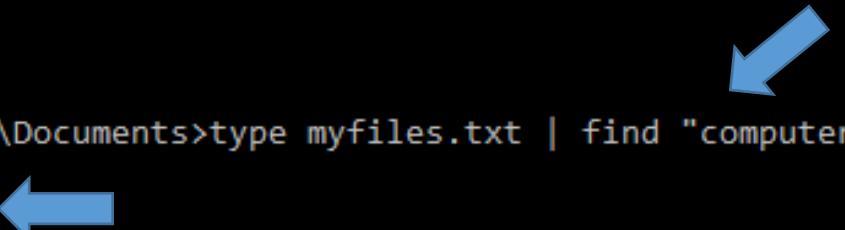
C:\Users\Administrator\Documents>type myfiles.txt ←
File list one
computer purchases
computer upgrades
lab capacity planning
C:\Users\Administrator\Documents> } ←
```

- Back at the command prompt, Execute the command “**dir**” to ensure the file is there.
- Then Execute the command “**type myfiles.txt**”.
- What can be observed?
- The **type** command displays the contents of the file to the screen.
- How can this be useful?
- It’s an easy way to see the contents of a relatively small text file without opening it in notepad or other GUI text editors.

Windows CLI Intro - type

```
09/23/2017  08:42 AM    <DIR>          folder2
09/24/2017  09:38 PM    <DIR>          games
09/24/2017  09:38 PM    <DIR>          groceries
09/25/2017  08:00 PM           75 myfiles.txt
              1 File(s)       75 bytes
              6 Dir(s)  19,253,207,040 bytes free

C:\Users\Administrator\Documents>type myfiles.txt
File list one
computer purchases
computer upgrades
lab capacity planning
C:\Users\Administrator\Documents>type myfiles.txt | find "computer"
computer purchases
computer upgrades
C:\Users\Administrator\Documents>
```



- Extending the functionality of the type command, it can be piped to find.
- Execute the command ‘**type myfiles.txt | find “computer”**’.
- What happens here?

Windows CLI Intro - more

```
Administrator: Command Prompt
computer upgrades

C:\Users\Administrator\Documents>more /?
Displays output one screen at a time.

MORE [/E [/C] [/P] [/S] [/Tn] [+n]] < [drive:][path]filename
command-name | MORE [/E [/C] [/P] [/S] [/Tn] [+n]]
MORE /E [/C] [/P] [/S] [/Tn] [+n] [files]

[drive:][path]filename    Specifies a file to display one
                           screen at a time.

command-name            Specifies a command whose output
                           will be displayed.

/E                     Enable extended features
/C                     Clear screen before displaying page
/P                     Expand FormFeed characters
/S                     Squeeze multiple blank lines into a single line
/Tn                   Expand tabs to n spaces (default 8)

                           Switches can be present in the MORE environment
                           variable.

+n                    Start displaying the first file at line n

files                 List of files to be displayed. Files in the list
                           are separated by blanks.

If extended features are enabled, the following commands
```

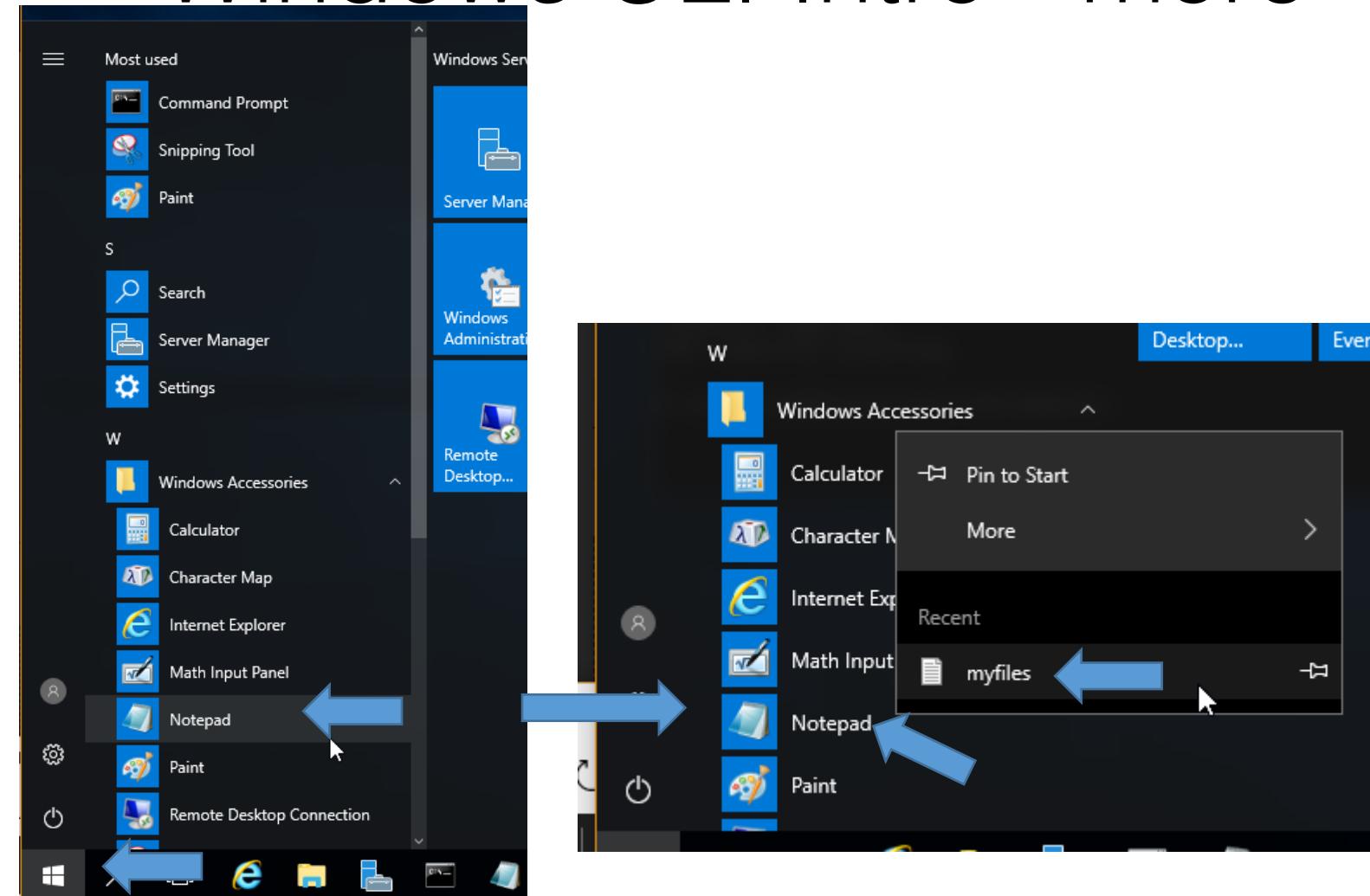
- Execute the command “**more /?**”.
- The **more** command has numerous options, but its main purpose is to format output to display a screen at a time.
- You pipe command output to the **more** command.

Windows CLI Intro - more

```
C:\Users\Administrator\Documents>type myfiles.txt | more ←  
File list one  
computer purchases  
computer upgrades  
lab capacity planning ←  
C:\Users\Administrator\Documents>
```

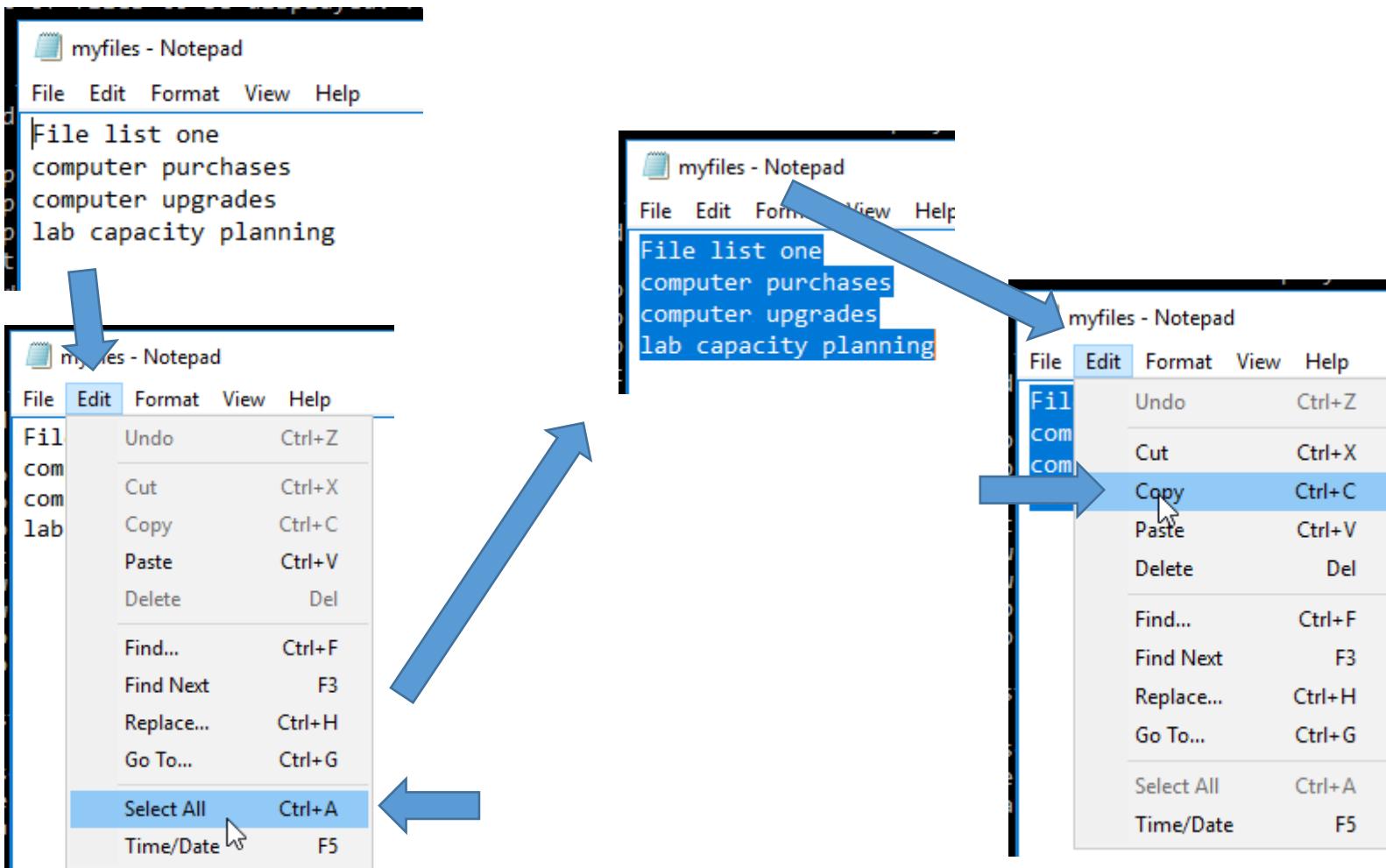
- Execute the command “**type myfiles.txt | more**”.
- What happened?

Windows CLI Intro - more



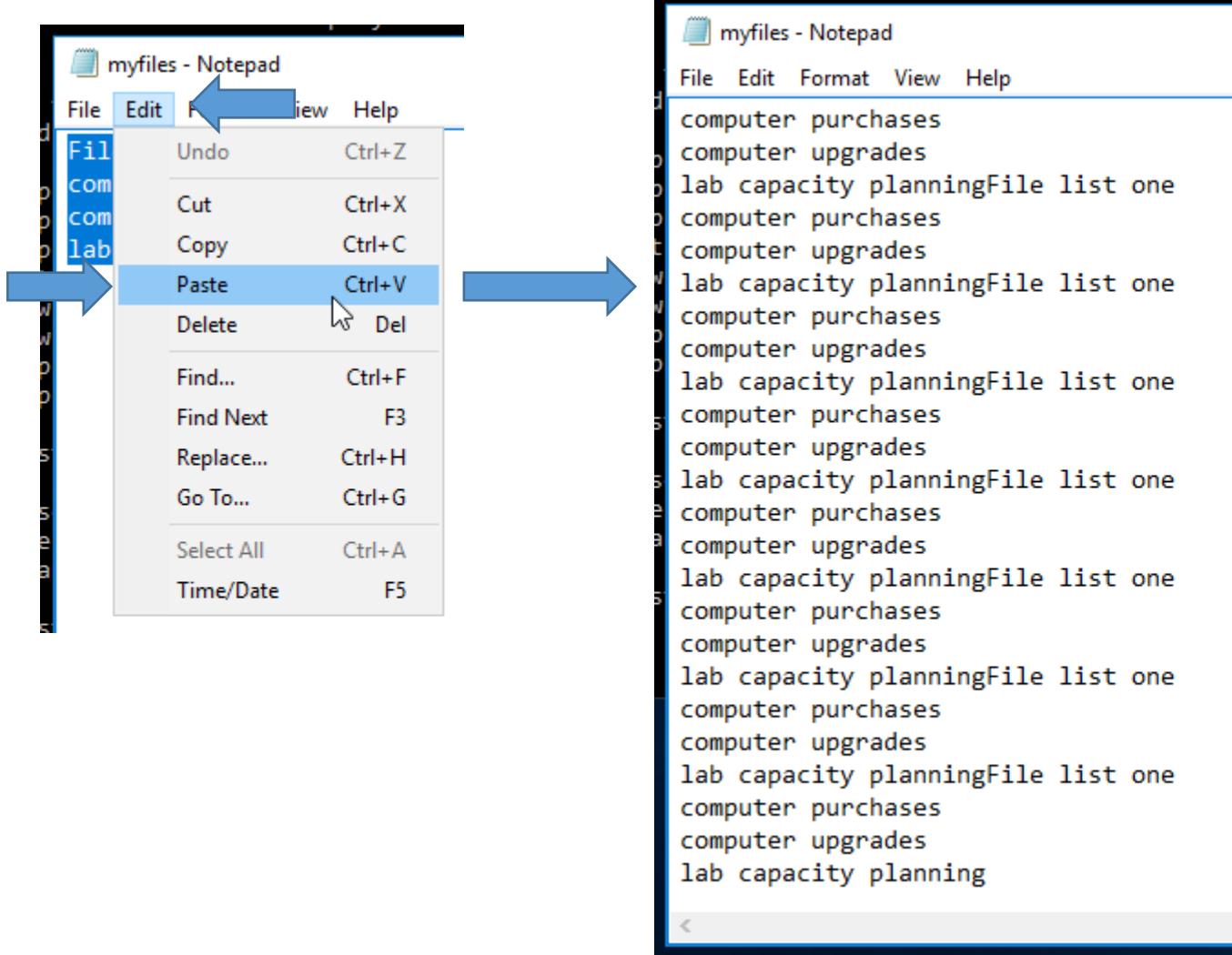
- Open the `myfiles.txt` file in notepad and duplicate the lines of text at least 10 times.
- Click Start → Expand “Windows Accessories” → Right click on “**Notepad**” → click on “**myfiles**”.

Windows CLI Intro - more



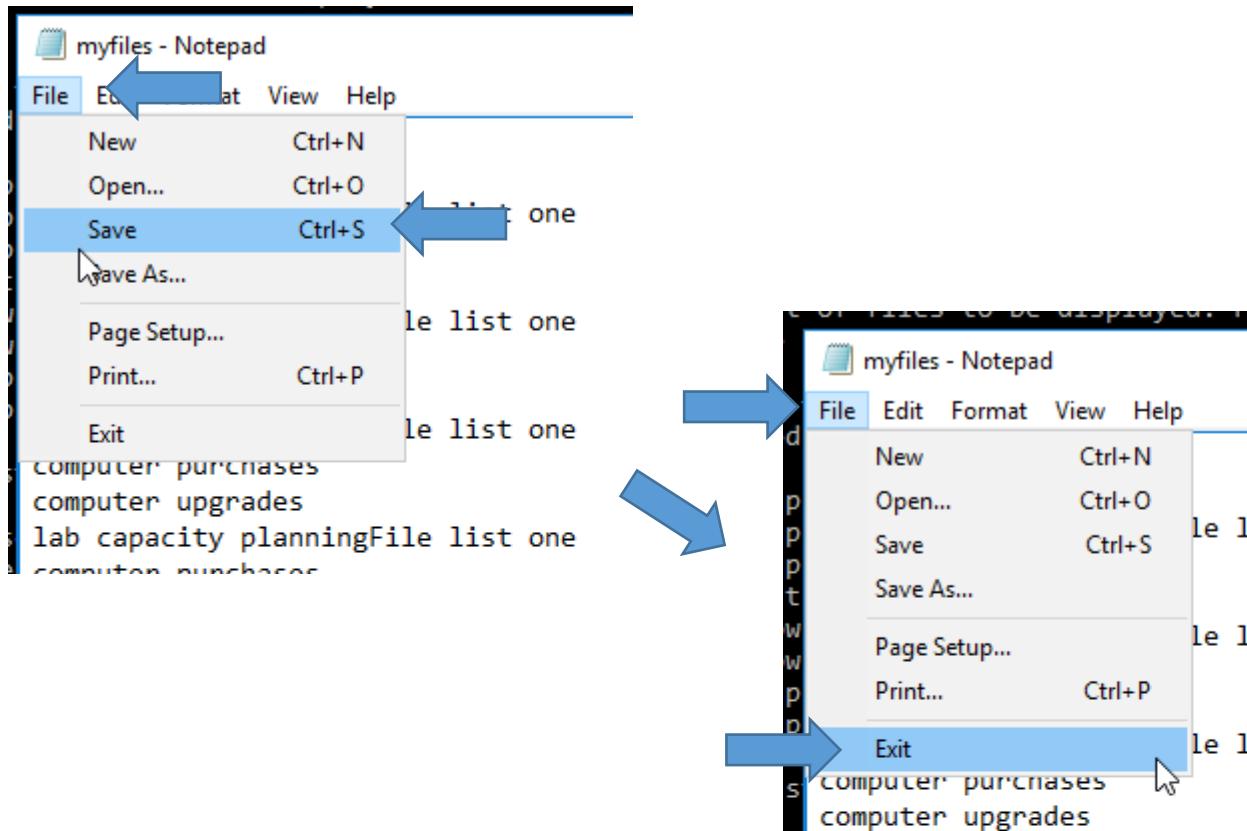
- Click “Edit” → click on “Select All” → Click on “Edit” → Click on “Copy”.

Windows CLI Intro - more



- Click on “Edit” → Click on “Paste”.
- Repeat “Edit” and “Paste” at least 10 times.

Windows CLI Intro - more



- Save the file and exit.
- Click “File” → Click “Save” → Click “File” → Click “Exit”.

Windows CLI Intro - more

```
C:\ Administrator: Command Prompt
File list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
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lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
-- More --
```

```
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
C:\Users\Administrator\Documents>
```

- Execute the command “**type myfiles.txt | more**”.
- What happened this time?
- Press “**enter**” a few times.
- Press the space bar.

Windows CLI Intro - pause

```
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planning
C:\Users\Administrator\Documents>pause ←
Press any key to continue . . . ←
```

```
Lab capacity planning
C:\Users\Administrator\Documents>pause
Press any key to continue . . .
C:\Users\Administrator\Documents>←
```

- Execute the command “**pause**”.
- What happened?
- Press any key (typically the **enter** key or **spacebar**).
- The pause command is more for batch files and allows for interactive feedback from the user.

Windows CLI Intro - timeout

```
C:\Users\Administrator\Documents>pause  
Press any key to continue . . .  
  
C:\Users\Administrator\Documents>timeout 30 ←  
  
Waiting for 26 seconds, press a key to continue ... ←
```

```
C:\Users\Administrator\Documents>pause  
Press any key to continue . . .  
  
C:\Users\Administrator\Documents>timeout 30 ←  
  
Waiting for 0 seconds, press a key to continue ... ←  
  
C:\Users\Administrator\Documents> ←
```

- Execute the command “**timeout 30**”.
- Like the **pause** command it has the “**press a key to continue...**” but there is a countdown timer.
- Very good for batch files where the user can be presented some output before proceeding or if you need to wait for something to happen first.

Windows Output Redirection - >

```
C:\Users\Administrator\Documents>type myfiles.txt > afile2.txt
```

```
C:\Users\Administrator\Documents>dir  
Volume in drive C has no label.  
Volume Serial Number is 2284-294B
```

```
Directory of C:\Users\Administrator\Documents
```

```
09/25/2017  09:11 PM    <DIR>          .  
09/25/2017  09:11 PM    <DIR>          ..  
09/25/2017  09:11 PM            1,050 afile2.txt  
09/25/2017  09:03 AM    <DIR>          folder1  
09/25/2017  08:42 AM    <DIR>          folder2  
09/24/2017  09:38 PM    <DIR>          games  
09/24/2017  09:38 PM    <DIR>          groceries  
09/25/2017  08:58 PM            1,050 myfiles.txt  
                           2 File(s)        2,100 bytes  
                           6 Dir(s)   19,426,226,176 bytes free
```

```
C:\Users\Administrator\Documents>
```

- Execute the command “**type myfiles.txt > afile2.txt**”.
- What happened?
- Execute the command “**dir**”.
- What do you see?
- A file called “**afile2.txt**” was created. It has the same size as “**myfiles.txt**”.
- The output of the type command was redirected to a file using the “**>**” redirection arrow.

Windows Output Redirection - >

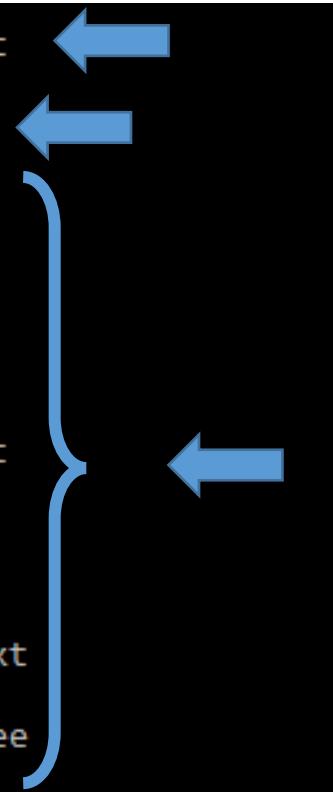
```
C:\Users\Administrator\Documents>type afile2.txt
File list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planning
C:\Users\Administrator\Documents>
```

The diagram illustrates the concept of output redirection in Windows. It shows two separate command-line sessions. The top session shows the command `type afile2.txt` followed by its output, which consists of several lines of text. The bottom session shows the command `type myfiles.txt` followed by its output, which also consists of several lines of text. On the right side of each session, there are blue curly braces and arrows. The top brace groups the command and its output, with an arrow pointing from the right towards the left. The bottom brace also groups the command and its output, with an arrow pointing from the right towards the left. This visual representation emphasizes that the output of the command is being directed to the right, specifically to a file or another command.

- View the contents of the “**afile2.txt**” file.
- Execute the command “**type afile2.txt**”.
- It should have the same contents as “**myfiles.txt**”.

Windows Output Redirection - >

```
tab capacity planning
C:\Users\Administrator\Documents>dir > afile2.txt ←
C:\Users\Administrator\Documents>type afile2.txt ←
Volume in drive C has no label.
Volume Serial Number is 2284-294B
Directory of C:\Users\Administrator\Documents
09/25/2017  09:11 PM    <DIR>          .
09/25/2017  09:11 PM    <DIR>          ..
09/25/2017  09:23 PM          0 afile2.txt
09/25/2017  09:03 AM    <DIR>          folder1
09/25/2017  08:42 AM    <DIR>          folder2
09/24/2017  09:38 PM    <DIR>          games
09/24/2017  09:38 PM    <DIR>          groceries
09/25/2017  08:58 PM          1,050 myfiles.txt
                           2 File(s)      1,050 bytes
                           6 Dir(s)  19,426,209,792 bytes free
C:\Users\Administrator\Documents>
```



- Execute the command “**dir > afile2.txt**”.
- What is the possible outcome here?
- Execute the command “**type afile2.txt**”.
- What can be observed here?
- The output of the **dir** command was sent to the **afle2.txt** but it overwritten.
- The “**>**” redirect creates a new file if it doesn’t exist but it always overwrites the contents.
- This has multiple uses especially in batch files, for instance you want to clear the contents of a file first before writing to it.

Windows Output Redirection - >>

```
C:\Users\Administrator\Documents>type myfiles.txt >> afile2.txt
```

```
C:\Users\Administrator\Documents>dir
```

```
Volume in drive C has no label.  
Volume Serial Number is 2284-294B
```

```
Directory of C:\Users\Administrator\Documents
```

```
09/25/2017  09:11 PM    <DIR>          .
09/25/2017  09:11 PM    <DIR>          ..
09/25/2017  09:29 PM            1,651 afile2.txt
09/25/2017  09:03 AM    <DIR>          folder1
09/25/2017  08:42 AM    <DIR>          folder2
09/24/2017  09:38 PM    <DIR>          games
09/24/2017  09:38 PM    <DIR>          groceries
09/25/2017  08:58 PM            1,050 myfiles.txt
                           2 File(s)        2,701 bytes
                           6 Dir(s)  19,426,205,696 bytes free
```

```
C:\Users\Administrator\Documents>
```

- Execute the command “**type myfiles.txt >> afile2.txt**”.
- Execute the command “**dir**”.
- What can be observed with the files sizes of “**myfiles.txt**” and “**afile2.txt**”.
- The file sizes are different.

Windows Output Redirection - >>

```
C:\Users\Administrator\Documents>type afile2.txt
Volume in drive C has no label.
Volume Serial Number is 2284-294B

Directory of C:\Users\Administrator\Documents

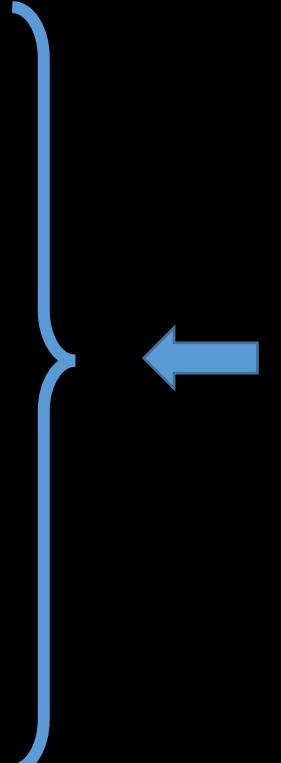
09/25/2017  09:11 PM    <DIR>          .
09/25/2017  09:11 PM    <DIR>          ..
09/25/2017  09:23 PM          0 afile2.txt
09/25/2017  09:03 AM    <DIR>          folder1
09/25/2017  08:42 AM    <DIR>          folder2
09/24/2017  09:38 PM    <DIR>          games
09/24/2017  09:38 PM    <DIR>          groceries
09/25/2017  08:58 PM          1,050 myfiles.txt
                           2 File(s)           1,050 bytes
                           6 Dir(s)  19,426,209,792 bytes free

File list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
```

- Execute the command “**type afile2.txt**”.
- What can be observed?
- You can see the output of the **dir** command and the contents of the **myfiles.txt**.

Windows Output Redirection - >>

```
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planning
C:\Users\Administrator\Documents>
```



- Execute the command “**type afile2.txt**”.
- The “**>>**” redirection appends data to the file.
- Also used in batch files but very good for keeping records or logs.

Windows Output Redirection - <

The screenshot shows two separate Command Prompt windows. The top window displays the command 'more < afile2.txt' with a blue arrow pointing to the left side of the command. The bottom window shows the directory contents of 'C:\Users\Administrator\Documents' and lists several files and folders, with a blue brace on the left side grouping the two windows.

```
Administrator: Command Prompt - more
computer upgrades
lab capacity planning
C:\Users\Administrator\Documents>more < afile2.txt ←

Volume in drive C has no label.
Volume Serial Number is 2284-294B

Directory of C:\Users\Administrator\Documents

09/25/2017  09:11 PM    <DIR> .
09/25/2017  09:11 PM    <DIR> ..

Administrator: Command Prompt - more
Volume in drive C has no label.
Volume Serial Number is 2284-294B

Directory of C:\Users\Administrator\Documents

09/25/2017  09:11 PM    <DIR> .
09/25/2017  09:11 PM    <DIR> ..
09/25/2017  09:23 PM          0 afile2.txt
09/25/2017  09:03 AM    <DIR> folder1
09/25/2017  08:42 AM    <DIR> folder2
09/24/2017  09:38 PM    <DIR> games
09/24/2017  09:38 PM    <DIR> groceries
09/25/2017  08:58 PM          1,050 myfiles.txt
                           2 File(s)      1,050 bytes
                           6 Dir(s)  19,426,209,792 bytes free
File list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
computer upgrades
lab capacity planningFile list one
computer purchases
-- More --
```

- Execute the command “**more < afile2.txt**”.
- What happens here?
- We are displaying the contents of the **afile2.txt** file one screen at a time using the **more** and **<** command combination.
- Press the spacebar a few times to display all the contents of the file.

Windows Output Redirection - <

```
computer upgrades  
lab capacity planning  
C:\Users\Administrator\Documents>find "computer" < afile2.txt  
computer purchases  
computer upgrades  
computer purchases  
computer upgrades  
computer purchases  
computer upgrades  
computer purchases  
computer upgrades  
C:\Users\Administrator\Documents>
```

- Execute the command ‘**find “computer” < afile2.txt**’.
- What happens here?
- The contents of **afile2.txt** was sent to the **find** command and it filtered all lines with the string **computer**.
- The **<** can be used to take content from a file and send it as input to a program.

Windows Output Redirection - 2>&1

```
C:\ Administrator: Command Prompt  
yC:\Users\Administrator\Documents>invalidcommand > afile3.txt  
'invalidcommand' is not recognized as an internal or external command,  
operable program or batch file.  
  
C:\Users\Administrator\Documents>dir ←  
Volume in drive C has no label.  
Volume Serial Number is 2284-294B  
  
Directory of C:\Users\Administrator\Documents  
  
09/25/2017 09:51 PM <DIR> .  
09/25/2017 09:51 PM <DIR> .. ←  
09/25/2017 09:29 PM 1,651 afile2.txt  
09/25/2017 09:58 PM 0 afile3.txt ←  
09/25/2017 09:03 AM <DIR> folder1  
09/25/2017 08:42 AM <DIR> folder2  
09/24/2017 09:38 PM <DIR> games  
09/24/2017 09:38 PM <DIR> groceries  
09/25/2017 08:58 PM 1,050 myfiles.txt  
3 File(s) 2,701 bytes  
6 Dir(s) 19,426,189,312 bytes free  
  
C:\Users\Administrator\Documents>
```

- Execute the command “**invalidcommand > afile3.txt**”.
- What happens here?
- Execute the command “**dir**”.
- The file **afile3.txt** was created but zero bytes in size.

Windows Output Redirection - 2>&1

```
6 Dir(s) 19,426,189,312 bytes free

C:\Users\Administrator\Documents>invalidcommand > afile3.txt 2>&1 ←

C:\Users\Administrator\Documents>dir ←
Volume in drive C has no label.
Volume Serial Number is 2284-294B

Directory of C:\Users\Administrator\Documents

09/25/2017  09:51 PM    <DIR>          .
09/25/2017  09:51 PM    <DIR>          ..
09/25/2017  09:29 PM            1,651 afile2.txt ←
09/25/2017  10:01 PM            105 afile3.txt ←
09/25/2017  09:03 AM    <DIR>          folder1
09/25/2017  08:42 AM    <DIR>          folder2
09/24/2017  09:38 PM    <DIR>          games
09/24/2017  09:38 PM    <DIR>          groceries
09/25/2017  08:58 PM            1,050 myfiles.txt
              3 File(s)           2,806 bytes
              6 Dir(s) 19,426,189,312 bytes free

C:\Users\Administrator\Documents>
```

- Execute the command “**invalidcommand > afile3.txt 2>&1**”.
- What happens here?
- The error wasn’t displayed on the screen.
- Execute the command “**dir**”.
- The file **afile3.txt** was created and has some content in it.

Windows Output Redirection - 2>&1

```
C:\Users\Administrator\Documents>invalidcommand > afile3.txt 2>&1 ←  
C:\Users\Administrator\Documents>dir ←  
Volume in drive C has no label.  
Volume Serial Number is 2284-294B  
  
Directory of C:\Users\Administrator\Documents  
  
09/25/2017 09:51 PM <DIR> .  
09/25/2017 09:51 PM <DIR> ..  
09/25/2017 09:29 PM 1,651 afile2.txt  
09/25/2017 10:01 PM 105 afile3.txt ←  
09/25/2017 09:03 AM <DIR> folder1  
09/25/2017 08:42 AM <DIR> folder2  
09/24/2017 09:38 PM <DIR> games  
09/24/2017 09:38 PM <DIR> groceries  
09/25/2017 08:58 PM 1,050 myfiles.txt  
    3 File(s)      2,806 bytes  
    6 Dir(s) 19,426,189,312 bytes free  
  
C:\Users\Administrator\Documents>type afile3.txt ←  
'invalidcommand' is not recognized as an internal or external command,  
operable program or batch file. ←  
  
C:\Users\Administrator\Documents>
```

- Execute the command “**type > afile3.txt**”.
- What happens here?
- The error was sent to the file **afile3.txt**.
- The **2>&1 redirect**, redirects errors to a file.
- Where can this be used?

Windows Output Redirection - >CON

```
3 File(s)          2,806 bytes
6 Dir(s)  19,426,189,312 bytes free

C:\Users\Administrator\Documents>type afile3.txt
'invalidecommand' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Administrator\Documents>echo Test to the console >con ←
Test to the console

C:\Users\Administrator\Documents>
```

- Execute the command “**echo Text to the console >con**”.
- Used to redirect text to the console and used in batch files.

Windows Output Redirection - >NUL

```
C:\ Administrator: Command Prompt  
yC:\Users\Administrator\Documents>echo test to nul >NUL  
C:\Users\Administrator\Documents>dir >NUL  
C:\Users\Administrator\Documents>type afile2.txt >NUL  
C:\Users\Administrator\Documents>dir  
Volume in drive C has no label.  
Volume Serial Number is 2284-294B  
Directory of C:\Users\Administrator\Documents  
  
09/25/2017  10:09 PM    <DIR>          .  
09/25/2017  10:09 PM    <DIR>          ..  
09/25/2017  09:29 PM            1,651 afile2.txt  
09/25/2017  10:06 PM            652 afile3.txt  
09/25/2017  09:03 AM    <DIR>          folder1  
09/25/2017  08:42 AM    <DIR>          folder2  
09/24/2017  09:38 PM    <DIR>          games  
09/24/2017  09:38 PM    <DIR>          groceries  
09/25/2017  08:58 PM            1,050 myfiles.txt  
                           3 File(s)           3,353 bytes  
                           6 Dir(s)  19,426,181,120 bytes free  
C:\Users\Administrator\Documents>
```

- Execute the command “echo test to nul >**NUL**”.
- What happened here?
- Execute the command “dir >**NUL**”.
- Execute the command “type afile2.txt >**NUL**”.
- Execute the command “dir”.
- Is the **NUL** “file” present?
- **NUL** is a device that discards all output that is sent to it. Very good if you do not want to display an error or output but don’t want to record/log it either.

Further Reading

- https://www.tutorialspoint.com/batch_script/index.htm
- http://www.robvanderwoude.com/battech_redirection.php
- <https://www.howtogeek.com/206097/how-to-use-find-from-the-windows-command-prompt/>