

matthew beaney 2418770 os

by Matthew Beaney

Submission date: 10-Apr-2025 07:21PM (UTC+0100)

Submission ID: 255397364

File name: 58243_Matthew_Beaney_matthew_beaney_2418770_os_644541_1533739816.pdf (599.01K)

Word count: 1100

Character count: 5600

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2418770

Contents:

- Introduction
- Documentation of Windows OS CLI commands
- Documentation of Linux OS CLI commands
- Use of Windows OS scripts
- Use of Linux OS scripts
- Conclusion

This is intended to be a report that notes the key functions of operating systems, documents the use of Windows and Linux OS CLI commands and demonstrates their key features through documentation of script use. This report should also provide relevant supplementary information from the tutorial and lecture activities and should provide evidence of engagement with an online certified course relevant to the report.

Key functions of general operating systems

- Managing interaction between the user and software and hardware of the computer.
- Coordinates system resources so that (multiple) apps may run. // Process and Memory management. System and performance management.
- Work behind the scenes.
- Device management (input/output e.g. microphone, keyboard and monitor.)
- Error Detection and system recovery.
- System security management.
- File and directory management.

Windows CLI commands

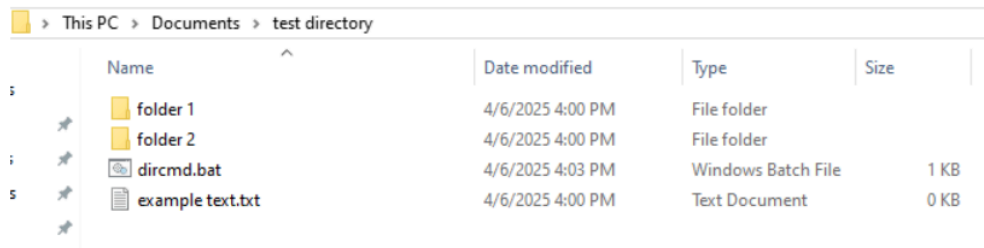
Batch

1. echo repeats text. Very simple, comparable to a print() statement in python. Can also be used as a setting to repeat messages, rather than simply echoing an input. ^[1]

```
C:\Users\soac-azure>echo Hello World  
Hello World
```

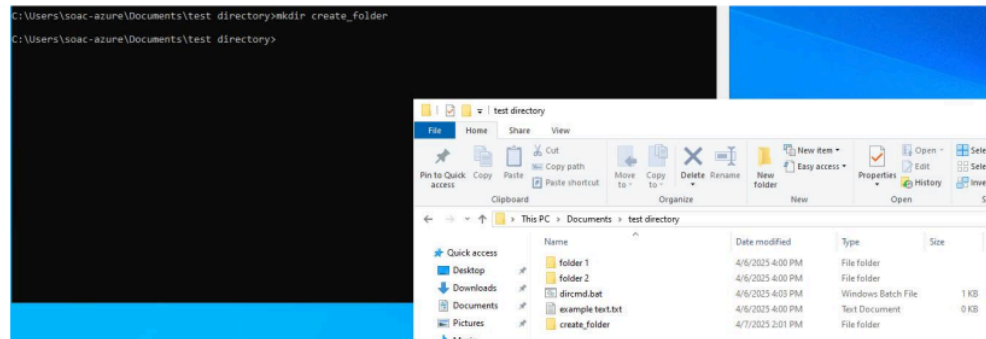
2. mkdir creates a new folder in the current directory. cd can be used to change directory to choose where to use mkdir. Its ultimately not necessary nor very intuitive to use over the file explorer but can be a little faster than using the file explorer interface to create a lot of folders. [2]

before



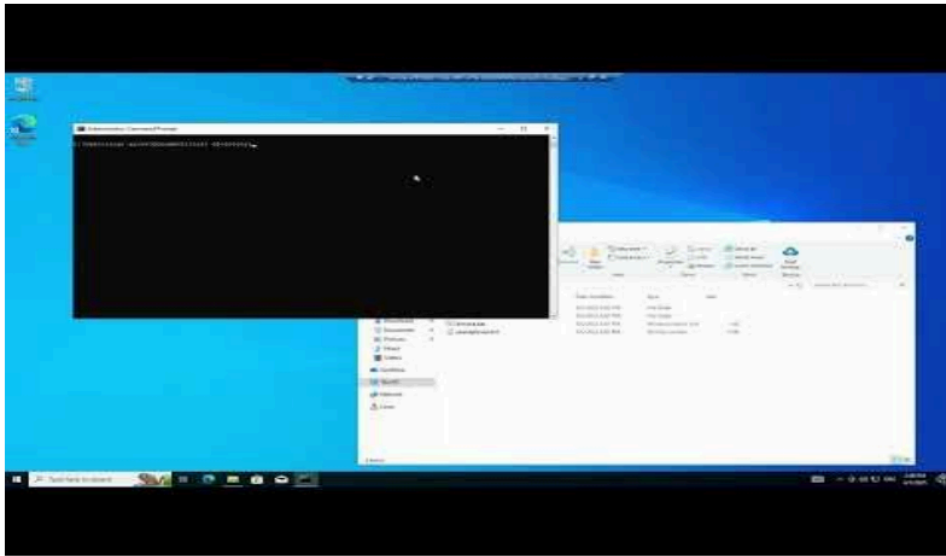
Name	Date modified	Type	Size
folder 1	4/6/2025 4:00 PM	File folder	
folder 2	4/6/2025 4:00 PM	File folder	
dircmd.bat	4/6/2025 4:03 PM	Windows Batch File	1 KB
example text.txt	4/6/2025 4:00 PM	Text Document	0 KB

after



3. cls clears screen (this also works in powershell). This can be used to make testing easier as it will be less cluttered and clearer what you have done and are looking at, without the prior commands taking up space.

<https://www.youtube.com/watch?v=iwpjjHRIKyA>



(I decided to record videos of some commands as I believed it to be a clearer showcase of ability to use them, rather than screenshots which *could* in theory be fabricated after getting syntax wrong or other such cases.)

4. `cd` sets the current directory used by command prompt. This is a pretty necessary command to make most others useful, otherwise you would only be operating in the base folder automatically set when the prompt is opened.

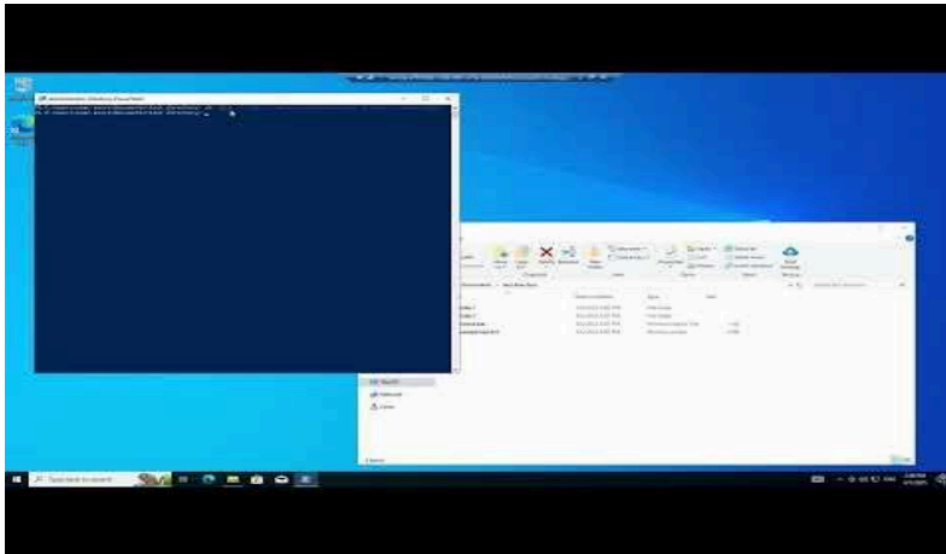
```
Microsoft Windows [Version 10.0.19045.3930]
(c) Microsoft Corporation. All rights reserved.

C:\Users\soac-azure>cd C:\Users\soac-azure\Documents\test directory
C:\Users\soac-azure\Documents\test directory>_
```

Powershell

5. `rm` removes a file or directory.

<https://www.youtube.com/watch?v=qQ761Mjf2w0>



6. `get-process` lists all active processes on the machine.

PS C:\Users\soac-azure\Documents\test directory> get-process

Handles	NPM(K)	PM(K)	WS(K)	CPU(s)	Id	SI	ProcessName
290	17	5052	26592	0.86	5140	2	ApplicationFrameHost
615	30	28504	41084	0.50	6088	0	ApplicationInsightsExtension
108	7	6232	10140	0.02	4704	0	conhost
108	7	6232	10184	0.03	5204	0	conhost
277	14	4388	18852	0.63	5860	2	conhost
111	7	6240	10252	0.34	5992	0	conhost
649	23	1888	4756	0.55	596	0	csrss
173	11	1704	4012	0.11	700	1	csrss
340	14	2200	6016	0.59	5356	2	csrss
451	17	4372	21472	1.28	3452	2	ctfmon
463	30	40688	58600	1.73	5176	0	DiagnosticsPlugin
213	17	3804	9964	0.06	3520	0	dllhost
255	24	5304	13536	0.22	8268	2	dllhost
778	25	18744	41276	0.34	1084	1	dwm
892	36	28292	80204	2.69	6916	2	dwm
2632	117	61560	179964	12.11	2352	2	explorer
196	14	4224	19404	0.09	8932	2	FileCoAuth
36	5	1208	2524	0.03	1008	1	fontdrvhost
36	5	1280	2648	0.02	1016	0	fontdrvhost
36	5	1488	4164	0.20	6028	2	fontdrvhost
0	0	60	8	0	0	0	Idle
595	32	14164	48952	0.47	1076	1	LogonUI
64	5	796	2396	0.05	832	0	LsaIso
1396	22	6668	16796	2.41	844	0	lsass
0	0	40	0	0.00	2356	0	Memory Compression
211	13	2688	2660	0.09	1328	0	MicrosoftEdgeUpdate
798	46	25240	42168	3.63	5108	0	MonAgentCore
145	8	1568	7904	0.06	5964	0	MonAgentHost
227	18	4940	15572	0.33	616	0	MonAgentManager
493	17	8612	19180	0.48	3528	0	MpDefenderCoreService
899	205	312428	281836	55.59	3648	0	MsMpEng
220	31	4600	10764	0.05	5492	0	NisSrv
897	53	49296	113364	2.89	8760	2	OneDrive
929	45	67936	86064	4.75	6340	2	powershell
349	14	2692	12300	0.45	2348	2	rdpclip
0	7	4772	73456	0.48	104	0	Registry
275	15	3276	16112	0.66	4216	2	RuntimeBroker
351	18	6660	27392	1.36	7724	2	RuntimeBroker
511	27	11312	38588	1.70	8020	2	RuntimeBroker
1575	135	181040	272252	21.02	7840	2	SearchApp
671	39	19588	27748	3.23	4616	0	SearchIndexer
0	0	188	38124	0.00	56	0	Secure System
354	14	4100	14236	0.33	8664	0	SecurityHealthService
174	10	1760	9300	0.03	8632	2	SecurityHealthSystray
757	14	5620	12544	4.19	824	0	services
117	7	6300	7616	0.45	2800	0	SgrmBroker

542	19	6288	28400	1.64	2832	2	sihost
409	22	7952	22864	0.13	8448	2	smartscreen
56	3	1064	1220	0.16	484	0	smss
514	24	6840	19616	0.36	3128	0	spoolsv
719	34	23776	75084	2.02	7568	2	StartMenuExperienceHost
213	11	4208	9784	0.09	76	0	svchost
1146	20	7004	13220	4.92	676	0	svchost
1461	21	9776	26684	2.55	980	0	svchost
413	25	20332	39832	1.42	992	0	svchost
356	15	2832	10348	0.33	1000	0	svchost
124	7	2304	7592	0.06	1120	0	svchost
140	9	1680	11156	0.03	1132	0	svchost
495	24	8860	37248	1.28	1192	2	svchost
917	33	77692	78972	2.58	1220	0	svchost
111	8	1244	4020	0.02	1248	0	svchost
163	7	1584	4788	0.13	1264	0	svchost
119	8	1420	4068	0.02	1272	0	svchost
245	13	3000	12876	0.63	1388	0	svchost
217	12	2296	9460	0.11	1408	0	svchost
301	10	2172	11660	0.08	1428	0	svchost
409	18	6440	14812	1.08	1460	0	svchost
452	15	20356	22420	1.34	1484	0	svchost
228	12	2816	11700	0.14	1552	0	svchost
127	8	1496	6072	0.03	1588	0	svchost
149	24	4748	7816	0.09	1660	0	svchost
249	13	2372	10200	0.16	1724	0	svchost
317	14	3552	20272	0.63	1748	0	svchost
224	10	2160	6460	0.27	1772	0	svchost
139	9	1580	4892	0.19	1904	0	svchost
155	10	1912	6436	0.19	1912	0	svchost
127	8	1524	4708	0.00	2012	0	svchost
131	8	1512	4792	0.06	2032	0	svchost
391	13	3924	9796	0.16	2060	0	svchost
194	9	1664	6300	0.03	2128	0	svchost
231	13	2552	12668	0.14	2136	0	svchost
173	9	2044	6904	0.06	2228	0	svchost
213	13	69988	75172	30.42	2236	0	svchost
179	8	1372	4620	0.05	2296	0	svchost
465	12	2936	8900	0.50	2368	0	svchost
185	11	2068	7080	0.06	2388	0	svchost
169	9	1816	7652	0.02	2440	0	svchost
230	15	2320	8040	0.09	2524	0	svchost
164	10	1776	7592	0.06	2532	0	svchost
167	10	1868	6248	0.08	2544	0	svchost
227	11	2500	9576	0.05	2656	0	svchost
179	9	1864	6828	0.31	2728	0	svchost
276	11	3164	9100	0.09	2760	0	svchost
266	14	2712	6736	0.16	2956	0	svchost

```

368 26 3888 13012 0.17 3404 0 svchost
419 15 9596 19032 1.69 3416 0 svchost
330 16 9400 16864 0.23 3424 0 svchost
390 21 5704 23752 0.36 3480 0 svchost
108 7 1232 3980 0.03 3496 0 svchost
211 12 2380 8012 0.05 3512 0 svchost
143 8 1340 4204 0.00 3536 0 svchost
362 15 2760 9792 0.11 3568 0 svchost
183 9 7024 15396 4.78 3596 0 svchost
395 20 4740 20800 0.31 3636 0 svchost
113 7 1312 4124 0.03 3856 0 svchost
126 7 1356 6016 0.00 4352 0 svchost
213 11 2080 7052 0.02 4444 0 svchost
160 10 2092 9320 0.06 4708 0 svchost
145 8 1756 5364 0.05 4896 0 svchost
198 12 2504 12084 0.52 5484 0 svchost
335 20 4432 17936 0.16 5688 0 svchost
153 9 1532 7004 0.05 5704 0 svchost
220 14 1944 6288 0.03 5712 0 svchost
423 19 5992 18176 0.50 5840 0 svchost
737 81 23156 33212 14.61 6316 0 svchost
226 13 3060 11024 0.05 6364 0 svchost
178 9 1908 8348 0.06 6424 0 svchost
206 12 1788 7744 0.03 6444 0 svchost
274 14 3704 21844 0.64 6740 0 svchost
516 29 9988 21012 0.08 7044 0 svchost
248 16 4416 14984 0.13 7076 0 svchost
309 15 3864 21656 0.14 7284 2 svchost
123 7 1272 6460 0.06 8916 0 svchost
262 15 3068 12752 0.06 9652 2 svchost
2971 0 200 152 15.59 4 0 System
419 23 10560 19840 1.09 2252 0 taskhostw
259 30 6100 15348 0.25 3924 2 taskhostw
545 23 9004 39572 0.55 6400 2 TextInputHost
894 42 58544 68560 3.20 3548 0 WaAppAgent
71 5 1044 3948 0.00 5332 0 WaSecAgentProv
649 40 45772 62712 4.70 3580 0 WindowsAzureGuestAgent
167 11 1564 5548 0.08 680 0 wininit
226 12 2588 9252 0.09 780 1 winlogon
258 12 2244 10328 0.17 6768 2 winlogon
184 10 1844 9204 0.05 6820 0 WmiApSrv
268 16 5060 16192 0.34 2080 0 WmiPrvSE
266 14 4396 13388 0.20 3276 0 WmiPrvSE
426 19 4876 19000 0.08 3712 0 wslservice
335 13 3396 34356 0.19 5160 0 WUDFHost

PS C:\Users\soac-azure\Documents\test directory>

```

7. set-location changes current working directory

```

PS C:\Users\soac-azure> set-location -Path "C:\Users\soac-azure\Documents\test directory"
PS C:\Users\soac-azure\Documents\test directory>

```

8. Get-Help provides information about cmdlets and commands

```

PS C:\Users\soac-azure\Documents\test directory> Get-Help

Do you want to run Update-Help?
The Update-Help cmdlet downloads the most current Help files for Windows PowerShell modules, and installs them on your
computer. For more information about the Update-Help cmdlet, see https://go.microsoft.com/fwlink/?LinkId=210614.
[Y] Yes [N] No [S] Suspend [?] Help (default is "Y"): n

TOPIC
    Windows PowerShell Help System

SHORT DESCRIPTION
    Displays help about Windows PowerShell cmdlets and concepts.

LONG DESCRIPTION
    Windows PowerShell Help describes Windows PowerShell cmdlets,
    functions, scripts, and modules, and explains concepts, including
    the elements of the Windows PowerShell language.

    Windows PowerShell does not include help files, but you can read the
    help topics online, or use the Update-Help cmdlet to download help files
    to your computer and then use the Get-Help cmdlet to display the help
    topics at the command line.

    You can also use the Update-Help cmdlet to download updated help files
    as they are released so that your local help content is never obsolete.

    Without help files, Get-Help displays auto-generated help for cmdlets,
    functions, and scripts.

ONLINE HELP
    You can find help for Windows PowerShell online in the TechNet Library
    beginning at http://go.microsoft.com/fwlink/?LinkId=108518.

    To open online help for any cmdlet or function, type:

        Get-Help <cmdlet-name> -Online

UPDATE-HELP
    To download and install help files on your computer:

        1. Start Windows PowerShell with the "Run as administrator" option.
        2. Type:

            Update-Help

    After the help files are installed, you can use the Get-Help cmdlet to
    display the help topics. You can also use the Update-Help cmdlet to
    download updated help files so that your local help files are always
    up-to-date.

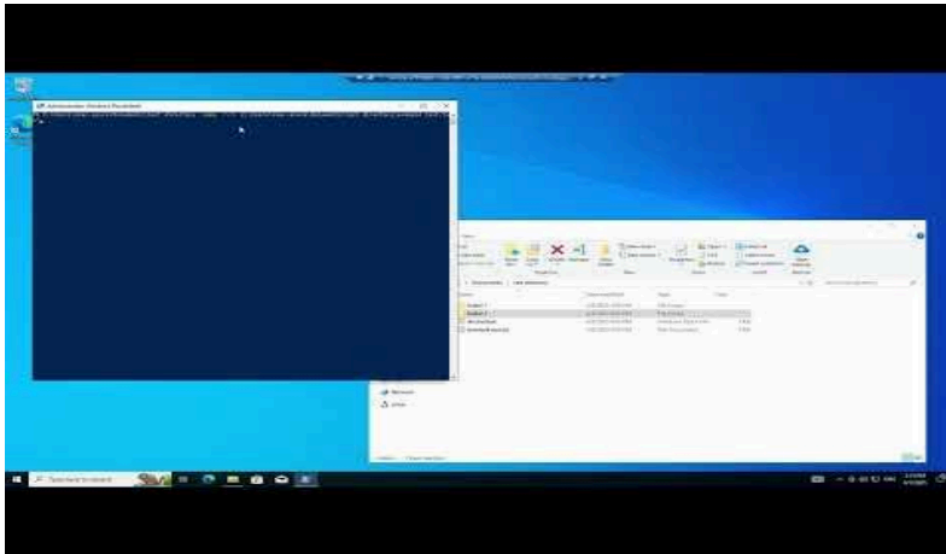
SEE ALSO:
    about_Updatable_Help
    Get-Help
    Save-Help
    Update-Help

PS C:\Users\soac-azure\Documents\test directory>

```

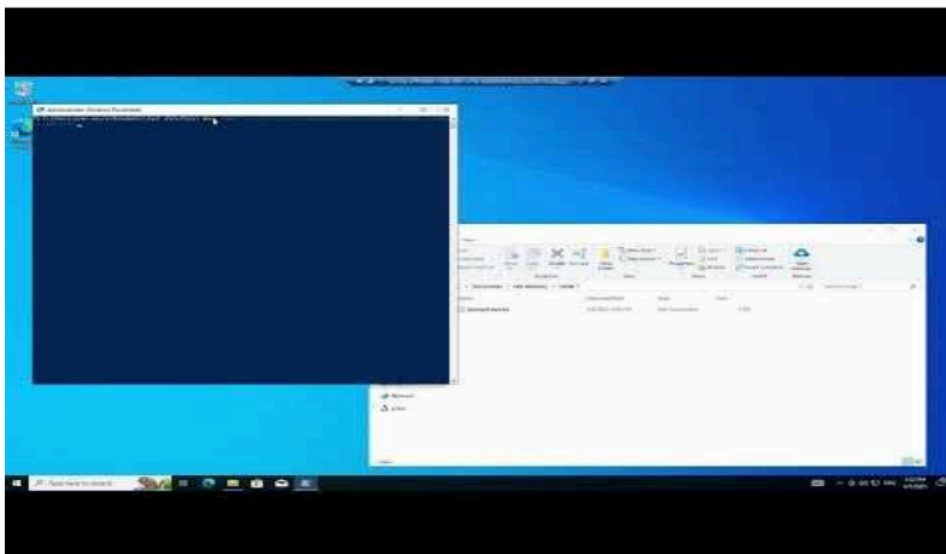
9. copy can clone files in one location into another. This can be helpful for copying something to many file locations, if you have the exact locations you want to hand, though it would ultimately be much more intuitive and probably faster to just ctrl-c ctrl-v in file explorer.

<https://www.youtube.com/watch?v=8WkrSvp0f7A>



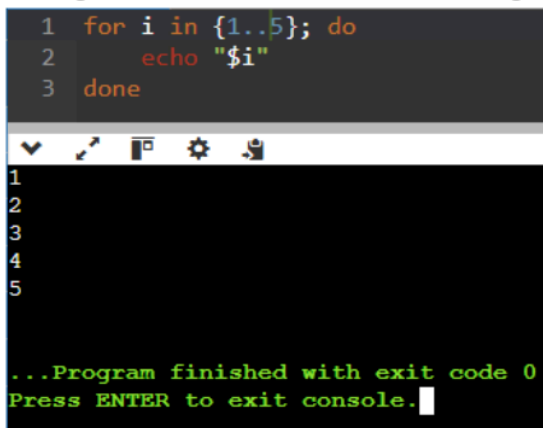
10. move can move files, like copy but the original is deleted. This can be faster than navigating file explorer if you remember the directories exactly, although it would be simpler and lower risk of user error to simply ctrl-x and ctrl-v the file(s) in question.

<https://www.youtube.com/watch?v=DXzXEO4ZUxc>



Linux CLI commands ^[3]

1. man. The man command displays a large set of information about various commands. It can be thought of as a help command.
2. cd. The cd command functions very similarly to that in the Windows command prompt, setting the directory to use.
3. if. The if command is a standard conditional, similar to what is seen in programming languages like python. It has a slightly different syntax, using “; then” to continue its effect upon fulfilment of a condition, and ending the if statement with “fi”.
4. rm. The rm command functions very similarly to how it does in Windows PowerShell, removing an item of the specified filename. You would need to add -r between the command and target in order to remove directories.
5. mkdir. The mkdir command functions very similarly to how it does in Windows command prompt, being used to create new directories.
6. ls. The ls command shows all of the files names in a directory, with -a appended it will also show hidden files. It can also show greater information about the files such as permissions.
7. echo. Echo functions the same as it does in Windows command prompt, like a print statement in python. It can be used to also repeat variables by using a “\$” before the variable, within the quotes, e.g. “variable \$x”.
8. for. The for command is another command very similar to a python statement. It can be used to reiterate a command a fixed or non-fixed number of times. Its further lines are not as simple as just “:” like in python but rather requires “; do” to go to its executables and a “done” to signify it is over after the loop.



```
1 for i in {1..5}; do
2     echo "$i"
3 done
```

1
2
3
4
5

...Program finished with exit code 0
Press ENTER to exit console.

9. notify-send. The notify-send command sends a notification to the system tray.
10. cat. The cat command concatenates and displays the information of files to the terminal.

11. sort. The sort command is used to process the data of a file and output it in a user-specified order, usually intended to make it easier to read compared to its state before filtering.

Use of Windows OS scripts

This PC > Documents > test directory > batch file test

Name	Date modified	Type	Size
batch.bat	4/9/2025 5:40 PM	Windows Batch File	1 KB
decrypt.bat	4/9/2025 5:38 PM	Windows Batch File	1 KB
encode_me.txt	4/9/2025 5:34 PM	Text Document	1 KB

batch.bat - Notepad

```
File Edit Format View Help
cd /d "%~dp0"
cls
mkdir test1
mkdir test2
cd "%~dp0\test1"
mkdir test3
cipher /e "C:\Users\soac-azure\Documents\test directory\batch file test\encode_me.txt"
pause
```

decrypt.bat - Notepad

```
File Edit Format View Help
cd /d "%~dp0"
cipher /d "C:\Users\soac-azure\Documents\test directory\batch file test\encode_me.txt"
```

Here I've written two small batch files that will do separate things.

The first, batch.bat, will create two sets of folders in the folder it is placed in; test1 and test2. In test1 another folder called test3 will be created. This is to demonstrate the ability to quickly and general ability to move folders, being able to function anywhere without constantly changing the file paths in the code. It will also encrypt the "encode_me.txt" file, using the cipher command.

The decrypt.bat will simply decrypt the encrypted file.

This PC > Documents > test directory > batch file test

Name	Date modified	Type	Size
test1	4/9/2025 5:43 PM	File folder	
test2	4/9/2025 5:43 PM	File folder	
batch.bat	4/9/2025 5:40 PM	Windows Batch File	1 KB
decrypt.bat	4/9/2025 5:38 PM	Windows Batch File	1 KB
encode_me.txt	4/9/2025 5:34 PM	Text Document	1 KB

This PC > Documents > test directory > batch file test > test1				
Name	Date modified	Type		
test3	4/9/2025 5:43 PM	File folder		

is PC > Documents > test directory > batch file test				
Name	Date modified	Type	Size	
test1	4/9/2025 5:43 PM	File folder		
test2	4/9/2025 5:43 PM	File folder		
batch.bat	4/9/2025 5:40 PM	Windows Batch File	1 KB	
decrypt.bat	4/9/2025 5:38 PM	Windows Batch File	1 KB	
encode_me.txt	4/9/2025 5:34 PM	Text Document	1 KB	

Conclusion

Overall, I have found that Windows and Linux share a lot of CLI commands, often using extremely similar syntax and conditions, not just identical commands.

This could stem from shared developers in the operating systems, standardisation for simplicity and other explanations.

Despite my choice to use a Batch script, I found that PowerShell's syntax and commands were easier to grasp mentally.

However, my own lacking knowledge has harmed my ability to fully explore, document and explain these. It is clear I should have dedicated more of my own free time to furthering my knowledge on this subject.

References:

- [1] <https://learn.microsoft.com/en-us/windows-server/administration/windows-commands/echo>
- [2] <https://learn.microsoft.com/en-us/windows-server/administration/windows-commands/mkdir>
- [3] <https://devhints.io/bash>

Appendices:

- OS tutorial 1, types of operating systems – General purpose, mobile, network, Real-time, Embedded and AI/Quantum. (Page 13&14)

FINAL GRADE

GENERAL COMMENTS

31 /100

Total:		31
1. Engagement with Literature Skills:		
+ Some use of citations. - reference list not formatted.	20	4
2. Knowledge and Understanding Skills:		
Key functions: +/- Overview of key OS functions documented, but each should be described and screenshots included showing where some of the functions can be seen/monitored/managed. Win Commands: + Good overview of relevant commands that demonstrates an understanding of the language. Bash Commands: + Good overview of relevant commands that demonstrates a sound understanding of the language. Win Scripts: Some good use of commands. - However, there is no script syntax that demonstrates an understanding of the scripting aspect of the language. Bash Scripts: + for loop. - Very little description of the scripting aspect of the language.	20	10

3. Cognitive and Intellectual Skills:		
+/- Evidence of analysis and understanding of OS functions could be enhanced. + Honest conclusion.	1 0	2
4. Practical Application Skills:		
1. Win Commands: + V. good use of relevant Win. language commands. 2. Bash Commands: - Use of 1 Bash command documented. 3. Win Scripts: - No use of Win scripts to demonstrate applied knowledge of the core syntax. 4. Bash Scripts: + for loop. - Little use of Bash scripts to demonstrate applied knowledge of the core syntax.	4 0	13
5. Transferable Skills for Life and Professional Practice:		

+/- Report format and presentation could be enhanced. - No title page. – Title page and Toc should be on their own pages. - Tutorial Activity 1 on OS Types: OS types need to be described. - Evidence of engagement with a relevant CPD course not documented in the appendix. - Lecture activity document not included.	10	2
Plagiarism & On-time check:		/

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