

Operating Systems

by George Taylor

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Computer Architecture and Operating Systems

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Introduction page:

This report focuses on discovering operating systems and functions that can be used in different operating systems by learning characteristics and concepts.

Key functions of general Operating Systems:

An operating system can perform many key functions [1]:

Interface: The OS creates an area where the user can interact with the machine, this can come in the forms of a graphical user interface (GUI) – where the user clicks to select options or a command-line interface (CLI) where the user types in order to tell the OS what it wants to do [3].

the CPU: The central processing unit (CPU) is the heart of the PC and keeps everything running, The OS can be used to interact with the CPU to help the user get what they desire out of the PC by allowing them to give instructions to the CPU to allow them to get the most out of their PC and enable them to perform certain technical functions such as monitor the PC and see what is running and help them reduce unnecessary tasks from being performed [2].

Security: it prevents unauthorized access to programs and data in the form of passwords and other methods to ensure that programmes and data is thoroughly protected [4].

Manages Input/Output Devices: an operating system can coordinate to hardware components in order to ensure each piece of hardware is working in synch with the rest of the PC this could be anything from internal hardware to external storage or speakers and something as simple as a keyboard and mouse [3].

Use of CLI commands in a Windows / Mac OS:

In the first example of using CLI commands in a windows OS is ipconfig (A1) This command displays the IP Network settings, by doing this I can clearly see that the PC is currently using an ethernet cable and the IPv4 address, subnet mask, and default Gateway can also be viewed. This can help in scenarios where the user may want to check that they are using the correct network and identify the networks features.

In the second example of using CLI commands, the command given was tree (A2) This command helps visualise the format of files that are saved on a pc, In the example (A2) you can see a Minecraft file called a bedrock server, due to the visualisation you can see all the files saved inside that folder which helps the user to see how the folders and files have been organised.

Use of CLI commands in a Linux OS:

The First Example of CLI commands in a Linux OS is history (A3) This displays all the previous commands that have been used in the OS during that session, this can help the user identify whether they are typing commands correctly and helps them keep track on tasks they have completed which can come in handy from an IT perspective where the same task may need to be repeated on multiple PCs.

The second example of CLI commands in a Linux OS is free (A4) This command shows how much free and taken space there is in terms of storage this can help the user identify how much space is being taken up on the PC and it can help the user troubleshoot if the PC is running slow as it could be a storage related issue.

Use of Batch scripts in a Windows / Mac OS:

One example of batch scripts is the ver command [5] The ver command can be used to show what version of the windows OS is being used (A5). This can help the operator if they need to run certain programs which require a certain version of the windows OS.

A second example of a batch script on windows OS is cls [6]. This helpful command can be used when The OS becomes too overcrowded and it becomes hard to distinguish the programming, cls then clears all previous commands leaving the user with a blank slate to continue with their work (A6).

Use of Bash scripts in a Linux OS:

One example of a bash scrip in Linux is echo [7]. Echo is used to print text into the programming (A7) this can be used to insert details to clarify programming to the operator.

The second example of bash script in Linux is the elif command [7]. The elif command is sued to create the else if statement which allows the operator to create programming which is able to interact with the user asking them to pick a number and if they correctly guess the number the operator put in then the OS will say the correct number has been put in.

Conclusion:

My conclusion to this assignment is that Operating systems can be very complex and large but enable a user to create whatever they want effectively. At first glance these commands can appear intimidating to those that have never interacted with operating systems, but once they have been used for a while the commands can become second nature to those in programming. This project has also helped me more deeply understand how computers operate and how we as users can interact with them

Referencing List (IEEE):

[1] BBC

“Operating systems” [Online]

Available: <https://www.bbc.co.uk/bitesize/guides/ztcdftr>

[Accessed March 17, 2021]

[2] D. Hemmendinger

“Operating system” Britannica. [Online]

Available: <https://www.britannica.com/technology/operating-system>

[Accessed March 17, 2021]

[3] B. Hussain [Mar 16, 2017]

“Operating system, its functions and characteristics” Computing technology with IT fundamentals

Available: <https://medium.com/computing-technology-with-it-fundamentals/operating-system-its-functions-and-characteristics-c0946e4215c6>

[Accessed March 17, 2021]

[4] tutorials point

“Operating System – Overview” [Online]

Available: https://www.tutorialspoint.com/operating_system/os_overview.htm

[Accessed March 17, 2021]

[5] tutorials point

“Learn Batch Script” [Online]

Available: https://www.tutorialspoint.com/batch_script/batch_script_ver.htm

[Accessed March 20, 2021]

[6] tutorials point

“Learn Batch Script” [Online]

Available: https://www.tutorialspoint.com/batch_script/batch_script_cls.htm

[Accessed March 20, 2021]

[7] Linux hint

“20 Bash Script Examples” [Online]

Available: https://linuxhint.com/30_bash_script_examples/#t1

[Accessed April 8, 2021]

Appendices:

(A1) demonstrating ipconfig CLI on windows.

(A2) demonstrating tree CLI on windows.

(A3) demonstrating history CLI on Linux.

(A4) demonstrating free CLI on Linux.

(A5) demonstrating ver on Windows.

(A6) demonstrating cls on Windows.

(A7) demonstrating echo on Linux.

Appendix 1:

[illegible]

Appendix 2:

```
C:\Windows\system32\cmd.exe

C:\Users\georg>tree
Folder PATH listing
Volume serial number is DE77-53D6
C:..
--ansel
--Cisco Packet Tracer 7.3.1
--extensions
--logs
--saves
--templates
--Contacts
--Documents
--Downloads
--bedrock-server-1.16.210.06
--behavior_packs
--chemistry
--entities
--texts
--test_vanilla_1.11
--entities
--test_vanilla_1.12
--entities
--vanilla
--behavior_trees
--entities
--items
--loot_tables
--chests
--village
--entities
--equipment
--gameplay
--entities
--fishing
--recipes
--spawn_rules
--trading
--economy_trades
--vanilla_1.14
--entities
--items
--recipes
--spawn_rules
--vanilla_1.15
--entities
--loot_tables
--entities
--recipes
--spawn_rules
--vanilla_1.16
--entities
--loot_tables
--chests
--entities
--recipes
--spawn_rules
--trading
--economy_trades
--vanilla_1.16.100
--entities
--loot_tables
--chests
--entities
--recipes
--spawn_rules
```

Appendix 3:

```
george@DESKTOP-E4MPJRE: ~  
-bash: cd/: No such file or directory  
george@DESKTOP-E4MPJRE:~$ history  
 1 jobs  
 2 apt-get update  
 3 apt-get upgrade  
 4 apt-get autoremove  
 5 LS  
 6 ls  
 7 cd  
 8 cd/  
 9 history  
george@DESKTOP-E4MPJRE:~$ █
```

Appendix 4:

```
george@DESKTOP-E4MPJRE: ~  
-bash: cd/: No such file or directory  
george@DESKTOP-E4MPJRE:~$ history  
1 jobs  
2 apt-get update  
3 apt-get upgrade  
4 apt-get autoremove  
5 LS  
6 ls  
7 cd  
8 cd/  
9 history  
george@DESKTOP-E4MPJRE:~$ free  
              total        used        free      shared  buff/cache   available  
Mem:        8335648       4907352       3198944       17720       229352       3294564  
Swap:       25165824         71060       25094764  
george@DESKTOP-E4MPJRE:~$
```

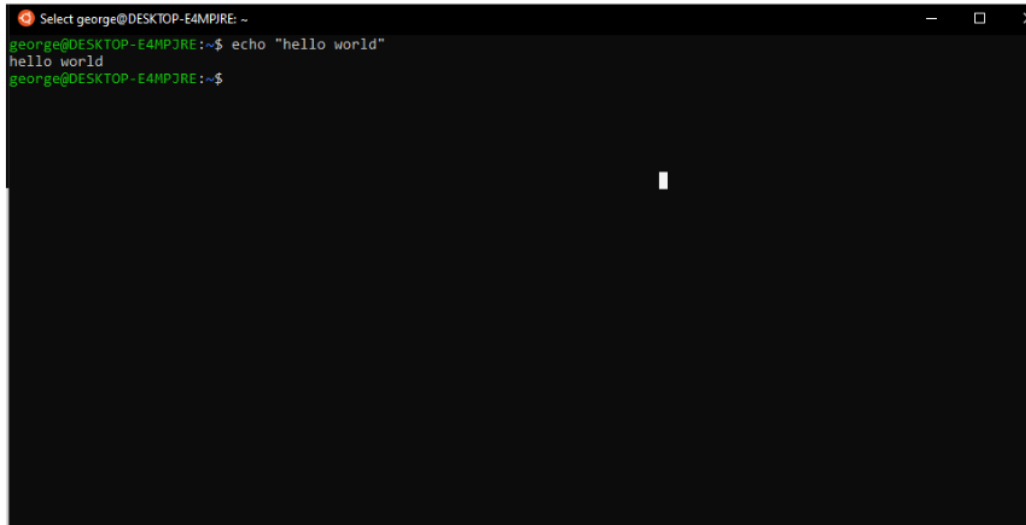
Appendix 5:

```
C:\Users\georg>ver  
Microsoft Windows [Version 10.0.19041.867]  
C:\Users\georg> _
```

Appendix 6:



Appendix 7:

A screenshot of a terminal window with a black background. The window title bar at the top reads "Select george@DESKTOP-E4MPJRE: ~" and includes standard window control icons (minimize, maximize, close). The terminal shows a green prompt "george@DESKTOP-E4MPJRE:~\$" followed by the command "echo 'hello world'". The output "hello world" is displayed on the next line. A second green prompt "george@DESKTOP-E4MPJRE:~\$" is shown at the bottom, with a white cursor character positioned after it.

```
Select george@DESKTOP-E4MPJRE: ~
george@DESKTOP-E4MPJRE:~$ echo "hello world"
hello world
george@DESKTOP-E4MPJRE:~$
```

Operating Systems

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

Instructor

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GRADING FORM: UWTSD GRADING FORM

GEORGE TAYLOR

1. RESEARCH LITERATURE

Extent of research and/or own reading, selection of credible sources, application of appropriate referencing conventions.



+ Good use of citations. + formatted reference list.
- An additional book and an academic paper could be included in the reference list and multiple citations used in places to sustain and gain extra marks in this category.

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2. KNOWLEDGE AND UNDERSTANDING

Extent of knowledge and understanding of concepts and underlying principles associated with the discipline.



Key functions: + Very good overview of key OS functions documented. – file management could be included. Bat Commands: + Some use of relevant commands with very good accompanying narration that demonstrates a sound understanding of the commands used. – 8 additional commands could be used. Bash Commands: + Some use of relevant commands with very good accompanying narration that demonstrates a sound understanding of the commands used. – 8 additional commands could be used. Bat Scripts: - No scripts documented. Bash Scripts: + Some good use and understanding

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of relevant scripts documented. – elif screenshot not documented. - could be extended with accompanying narration to demonstrate additional knowledge of the core syntax of the language. Note: Screenshots could be placed alongside narration in the main body of the report to enhance readability.

3. ANALYSIS

Analysis, evaluation and synthesis; logic, argument and judgement; analytical reflection; organisation of ideas and evidence.



Evidence of good analysis and understanding of OS functions and some evidence of analysis related to the relevant languages is documented. – could be extended in the areas mentioned above. + Conclusion.

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4. PRACTICAL APPLICATION

Deployment of methods, materials, tools and techniques; application of concepts; formulation of innovative and creative solutions to solve problems.



1. Bat Commands: + Some use of relevant commands. - could be extended to include additional commands. 2. Bash Commands: + Some use of relevant commands. - could be extended to include additional commands. 3. Bat Scripts: - No use of Bat scripts. 4. Bash Scripts: + Echo used. - could be extended to include additional scripts to demonstrate understanding of the scripting language e.g. use of a Variable, an Array, a loop,

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receiving User input, an if statement and a function.

5. PROFESSIONAL PRACTICE

Attributes in professional practice: individual and collaborative working; deployment of appropriate media; presentation and organisation.



+ Good report structure and presentation. - Screenshots could be placed alongside narration in the main body of the report to enhance readability and report format. - Report sections could be numbered. - Appendix: Activity 1 answer could be included.

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