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Assignment 2:

Operating Systems

CertHE Computing Skills for Workplace

Computer Architecture and Operating Systems.

ACCA4022_LON

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Introduction

1. Key functions of general Operating Systems

1.1 Process and Processor Management

Process and processor management refers to how an operating system controls running programs and allocates central processing unit resources. A process is an instance of a program in execution, and multiple processes may run concurrently on a system. The operating system uses scheduling algorithms to decide which process runs at a given time, ensuring efficient multitasking and fair resource allocation. This prevents conflicts and allows users to run several applications simultaneously without performance issues. For example, tools such as task manager in Microsoft Windows and activity monitor in macOS allow users to view, prioritize, and terminate processes when necessary. [1]

1.2 Memory Management

Memory management is responsible for handling the system's main memory (RAM) and ensuring that each process has enough space to execute efficiently. The operating system allocates and deallocates memory dynamically, preventing processes from interfering with each other. It also implements virtual memory, which uses secondary storage to extend available memory when RAM is insufficient. This improves system stability and enables more applications to run concurrently. Effective memory management ensures optimal system performance and reduces the risk of crashes caused by memory shortages. [2]

1.3 File System Management

File system management involves organizing, storing, and retrieving data on storage devices such as hard drives or solid-state drives. The operating system provides a hierarchical structure of files and directories, making it easier for users to manage data. Users can create, modify, delete, and search for files through graphical interfaces such as Finder in macOS and File Explorer in Microsoft Windows. Additionally, the file system ensures data integrity and controls access permissions to protect sensitive information. [3]

1.4 Security and Protection

Security and protection ensure that data and system resources are safeguarded from unauthorized access and threats. The operating system uses authentication methods such as usernames and passwords, as well as access control mechanisms to restrict user permissions. Additional features such as encryption, firewalls, and regular updates help protect against cyber threats. These combined functions ensure the confidentiality, integrity, and availability of data within the system, making operating systems essential for modern computing environments and everyday digital use. [4]

2. Use of Windows OS CLI commands.

The command line interface (CLI) provides a text based-based method for interacting with an operating system, allowing users to execute commands directly rather than relying on a graphical interface. In Unix-based systems such as macOS, shell commands are essential tools for system administration, troubleshooting, and automation. They offer greater control, efficiency, and precision when managing system resources compared to graphical user interfaces [5].

Process management commands enable users to monitor and control active programs. The `ps` command displays currently running processes along with their process identifiers (PIDs), allowing users to analyze system activity. The `kill 1234` command is used to terminate a process using its PID, which is particularly useful when dealing with unresponsive applications or freeing up systems resources [6].

File and directory management commands are fundamental for organizing and maintaining data. The `ls` command lists files and directories within the current working directory, while `cd` documents change the current directory to a specified location. Additionally, the `mkdir` test folder command creates a new directory, allowing users to structure their files efficiently. These commands provide a fast and flexible alternative to graphical file management tools [5].

Network monitoring commands are used to diagnose and troubleshoot connectivity issues. The ping google.com command sends packets to a remote host to test connectivity and measure response time. The ifconfig command displays network configuration details, including IP addresses and network interfaces, which are essential for identifying and resolving network problems [7].

User management commands help maintain system security and control access. The `whoami` command display the current user, while the `passwd` command allow users to update their password. These commands are important for enforcing authentication and ensuring that only authorized users can access system resources. [6].

Task scheduling commands support automation of routine tasks. The `crontab -l` command lists existing scheduled and `crontab -e` allows users to create or modify scheduled tasks. This enables efficient automation of repetitive processes, improving productivity and system performance [7].

Overall, CLI commands provide an efficient way to manage processes, files, networks, users, and automated tasks within an operating system environment [5].

[illegible]

Figure 1 output of ps aux command showing active system processes

```
andreea@MacBookAir ~ % ls
Desktop      Documents    Downloads    Library      Movies      Music        Pictures     Public       testfolder   vscode.zip
andreea@MacBookAir ~ %
```

Figure 2 output of the ls command showing created directory

```
64 bytes from 142.251.29.100: icmp_seq=0 ttl=112 time=5.260 ms
64 bytes from 142.251.29.100: icmp_seq=1 ttl=112 time=12.073 ms
64 bytes from 142.251.29.100: icmp_seq=2 ttl=112 time=10.042 ms
64 bytes from 142.251.29.100: icmp_seq=3 ttl=112 time=11.673 ms
64 bytes from 142.251.29.100: icmp_seq=4 ttl=112 time=13.117 ms
64 bytes from 142.251.29.100: icmp_seq=5 ttl=112 time=14.702 ms
64 bytes from 142.251.29.100: icmp_seq=6 ttl=112 time=9.784 ms
64 bytes from 142.251.29.100: icmp_seq=7 ttl=112 time=11.702 ms
64 bytes from 142.251.29.100: icmp_seq=8 ttl=112 time=12.196 ms
64 bytes from 142.251.29.100: icmp_seq=9 ttl=112 time=14.120 ms
64 bytes from 142.251.29.100: icmp_seq=10 ttl=112 time=6.874 ms
64 bytes from 142.251.29.100: icmp_seq=11 ttl=112 time=13.889 ms
64 bytes from 142.251.29.100: icmp_seq=12 ttl=112 time=14.404 ms
64 bytes from 142.251.29.100: icmp_seq=13 ttl=112 time=11.392 ms
64 bytes from 142.251.29.100: icmp_seq=14 ttl=112 time=11.834 ms
64 bytes from 142.251.29.100: icmp_seq=15 ttl=112 time=15.910 ms
64 bytes from 142.251.29.100: icmp_seq=16 ttl=112 time=10.389 ms
64 bytes from 142.251.29.100: icmp_seq=17 ttl=112 time=15.241 ms
64 bytes from 142.251.29.100: icmp_seq=18 ttl=112 time=13.010 ms
64 bytes from 142.251.29.100: icmp_seq=19 ttl=112 time=10.763 ms
64 bytes from 142.251.29.100: icmp_seq=20 ttl=112 time=11.581 ms
64 bytes from 142.251.29.100: icmp_seq=21 ttl=112 time=9.301 ms
```

Figure 3 output of the ping command showing network connectivity

```
andreea@MacBookAir ~ % whoami
andreea
```

Figure 4 output of the whoami command showing the current user

3. Use of Linux OS CLI commands.

The command line interface (CLI) in Linux – based systems allow users to interact with the operating system through text – based commands. These commands provide powerful control over system functions, making them essential for system administration, file management, and automation. Unix-based systems such as macOS use similar commands, allowing users to practice Linux operations effectively within the terminal environment [5].

Process management in Linux is performed using commands such as `ps` and `top`. The `ps` command displays active process along with their process IDs (PIDs), while `top` provides a real time view of system performance, including CPU and memory usage. Additionally, the `kill` command is used to terminate processes using their PID, which is useful when applications become unresponsive [6].

File and directory management is achieved using commands such as `ls`, `cd` and `mkdir`. The `ls` command lists files and directories in the current location, while `cd` changes the working directory. The `mkdir` command creates new directories, allowing users to organize files efficiently. These commands provide fast and flexible method for managing data without relying on graphical interfaces [5].

Network management commands helps diagnose connectivity issues. The `ping` command tests network connectivity by sending packets to a remote server, while the `ifconfig` or `ip` command displays network configuration details such as IP addresses. These tools are essential for troubleshooting network – related problems [6].

Task scheduling in Linux is managed using `crontab` -l command lists scheduled tasks, while `crontab -e` allows users to edit and create automated jobs. This enables efficient automation of repetitive tasks, improving systems performance and productivity [7].

Overall Linux CLI commands provide a powerful and efficient way to manage system operations and automate tasks within an operating systems environment [5].

```
andreea@MacBookAir ~ % ps
  PID TTY          TIME CMD
 22838 ttys000    0:00.03 -zsh
andreea@MacBookAir ~ %
```

```
andreea@MacBookAir ~ % ls
Desktop      Downloads    Movies       Pictures
Documents    Library      Music        Public
andreea@MacBookAir ~ %
```

testfolder
vscode.zip

```
andreea@MacBookAir ~ % mkdir
usage: mkdir [-pv] [-m mode] directory_name ...
andreea@MacBookAir ~ %
```

```
andreea@MacBookAir ~ % ping google.com
PING google.com (142.250.129.138): 56 data bytes
64 bytes from 142.250.129.138: icmp_seq=0 ttl=114 time=537.031 ms
64 bytes from 142.250.129.138: icmp_seq=1 ttl=114 time=350.365 ms
64 bytes from 142.250.129.138: icmp_seq=2 ttl=114 time=371.365 ms
64 bytes from 142.250.129.138: icmp_seq=3 ttl=114 time=594.990 ms
64 bytes from 142.250.129.138: icmp_seq=4 ttl=114 time=354.779 ms
64 bytes from 142.250.129.138: icmp_seq=5 ttl=114 time=327.813 ms
64 bytes from 142.250.129.138: icmp_seq=6 ttl=114 time=449.362 ms
64 bytes from 142.250.129.138: icmp_seq=7 ttl=114 time=327.998 ms
64 bytes from 142.250.129.138: icmp_seq=8 ttl=114 time=263.669 ms
64 bytes from 142.250.129.138: icmp_seq=9 ttl=114 time=304.241 ms
64 bytes from 142.250.129.138: icmp_seq=10 ttl=114 time=526.428 ms
64 bytes from 142.250.129.138: icmp_seq=11 ttl=114 time=295.589 ms
64 bytes from 142.250.129.138: icmp_seq=12 ttl=114 time=460.743 ms
64 bytes from 142.250.129.138: icmp_seq=13 ttl=114 time=376.847 ms
```

```
Process: 504 total, 0 running, 504 sleeping, 2000 threads
Load Avg: 2.56, 3.56, 5.05 CPU usage: 4.32% user, 4.20% sys, 91.11% idle SharedLibs: 40M resident, 111M data, 72M locked. MemRegions: 0 total, 88 resident, 88 private, 952M shared.
SysMem: 264M used (1136M virtual, 1136M compressed), 111M unused, 570M free, 362408(0) swaps, 482927(0) respages. Networks: packets: 12298972/130 in, 3642516/830M out.
CPU(s): 1280x200M used, 48577770M written.

PID COMMAND TIME CPU MEM PAGEIN PAGEOUT PAGES SWAPIN SWAPOUT SWAPDTH STATE BOOSTED
499 WindowServer 33.8 82.181.18 18 0 2554 8190e+ 10e+ 668 499 1 sleeping #0111 0.68728 0.16828 88 9722604 7769 5899682 4414846 7559146 16512885 4503346 16519 929766 34.4 166886832
500 kernel_task 12.8 82.164.19 6048 0 0 94964 80 0 0 running #010 0.11585 0 0 18738978 7415178 0 47009084 38 1574784 8.8 9020763
2863 screencapture 9.8 80.08.51 1 0 66 83388 753K 88 656 656 sleeping #0138 0.22748 0.00000 061 4123+ 135 1122 1884 2492+ 978+ 253+ 33 0 9.8 9818761
2862 top 5.9 80.01.58 17 0 29 82354 80 0 0 running #010 0.00000 0.00000 0 13792+ 188 549962+ 274932+ 63327+ 274932+ 432+ 11 0 9.8 9818761
11795 Microfit No 2.7 41.158.48 47 7 1386 55508 6384K 133K 11280 1 sleeping #0138 0.00000 0.00000 061 4396196 2763 9398672 1893836 4884999 45392132 7358881+ 247727 11398+ 2.8 12294744
136 location 1.6 81.02.16 1 0 0 99355 288K 2624K 260 1 sleeping #0138 0.00000 1.57723 060 907088 238 974267+ 865568 12674278 227802+ 487938+ 77431 13978 1.8 8787878
18161 com.apple.c 1.2 18.126.75 72 0 561 18406 144K 83K 18461 1 sleeping #0138 0.00000 0.00000 061 1243362 987 8746831 4316685 3383878 5864688 5305888+ 89222 27328+ 1.3 495132
9154 Terminal 0.8 80.14.51 11 4 178 38898 80 0 0 running #010 0.00000 0.00000 06 1396648 86 1346538+ 4774782 3646588 24749158 24749158 429 297448+ 1.8 8747878
23864 screencapture 0.8 80.08.18 1 1 178 88988 80 0 0 running #0138 0.00000 0.26748 061 2143 238 988+ 347+ 2715+ 2482+ 87+ 26 0 8.9 1364458
9154 Terminal 0.8 80.14.51 11 4 178 38898 80 0 0 running #010 0.01482 0.00000 061 201849 478 548738+ 15877+ 387886+ 168331+ 334324+ 7761 7987 0.8 1883884
3798 screencapture 0.8 18.135.88 0 7 1287 178 128K 1264K 378 1 sleeping #0138 0.00000 0.44417 0 444195+ 1478 93238+ 73279+ 1438548+ 28328+ 488488+ 43822 586 0.5 1286847
5088 xterm-256col 0.8 80.14.51 1 0 131 188 224K 8072K 588 1 sleeping #0138 0.00000 0.17785 0 898055 122 339778+ 374715+ 7589982+ 3038861+ 427333+ 131479 721 0.2 1644788
642 ShiftW 0.2 19.158.56 72 1 794 4899 1633K 237K 482 1 sleeping #0138 0.00000 0.00000 061 8694978 1478 3862437 1445821 7728783+ 727237+ 1893138+ 122808 524382+ 0.4 1884449
419 ShiftW 0.2 18.057.48 18 0 379 1408 80 0 0 running #0138 0.00000 0.00000 0 614688 216 1791125+ 627138+ 4897897+ 1463645+ 2181784+ 9793 4465 0.2 1767454
51428 PerPowerd 0.2 80.18.42 0 4 489 1306 424K 364K 2148 1 sleeping #0138 0.00000 0.00000 0 47847 131 118282+ 78461+ 1438382+ 1675748+ 1847478+ 1186 389 0.2 1644788
4841 coreprofile 0.1 81.059.29 2 0 139 43388 80 1532K 481 1 sleeping #0138 0.00000 0.00000 0 289531+ 173 448578+ 36459+ 374821+ 1874235+ 918588+ 2832 3877 0.1 1537788
382 powerd 0.1 80.16.37 0 0 181 8514 80 0 0 sleeping #0138 0.00000 0.00000 0 117865 138 87764+ 88647+ 118181+ 1488778+ 1338138+ 448 156 0.1 48361
14891 filerouting 0.1 80.12.22 18 4 393 134 224K 364K 11891 1 sleeping #0138 0.00000 0.00000 0 214778 219 77463+ 381343 970888+ 141861+ 188867+ 9765 1688 0.1 127114
642 audioiodm 0.1 80.14.51 1 0 88 83454 80 0 0 sleeping #0138 0.00000 0.00000 0 47847 131 118282+ 78461+ 1438382+ 1675748+ 1847478+ 1186 389 0.2 1644788
4841 filerouting 0.1 80.14.51 1 0 185 378 648K 378 482 1 sleeping #0138 0.00000 0.00000 0 614688 216 1791125+ 627138+ 4897897+ 1463645+ 2181784+ 9793 4465 0.2 1767454
642 audioiodm 0.1 80.14.51 1 0 88 83454 80 0 0 sleeping #0138 0.00000 0.00000 0 47847 131 118282+ 78461+ 1438382+ 1675748+ 1847478+ 1186 389 0.2 1644788
1 launchd 0.1 13.118.75 3 0 3889 218 80 441K 1 0 sleeping #0138 0.00000 0.00000 0 614688 216 1791125+ 627138+ 4897897+ 1463645+ 2181784+ 9793 4465 0.2 1767454
421 coreprofile 0.1 43.014.78 11 4 2282 198 80 4884K 421 1 sleeping #0138 0.00000 0.00000 0 614688 216 1791125+ 627138+ 4897897+ 1463645+ 2181784+ 9793 4465 0.2 1767454
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588 windows 0.1 80.08.53 5 0 113 298 80 113K 568 1 sleeping #0138 0.00000 0.00000 0 289531+ 173 448578+ 36459+ 374821+ 1874235+ 918588+ 2832 3877 0.1 1537788
642 windows 0.1 80.14.51 1 0 88 83454 80 0 0 sleeping #0138 0.00000 0.00000 0 47847 131 118282+ 78461+ 1438382+ 1675748+ 1847478+ 1186 389 0.2 1644788
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928 xterm-256col 0.1 80.18.42 0 7 1287 178 128K 1264K 378 1 sleeping #0138 0.00000 0.00000 0 444195+ 1478 93238+ 73279+ 1438548+ 28328+ 488488+ 43822 586 0.5 1286847
18281 Wallpaperd 0.1 80.18.42 0 7 1287 178 128K 1264K 378 1 sleeping #0138 0.00000 0.00000 0 444195+ 1478 93238+ 73279+ 1438548+ 28328+ 488488+ 43822 586 0.5 1286847
728 Wallpaperd 0.1 80.18.42 0 7 1287 178 128K 1264K 378 1 sleeping #0138 0.00000 0.00000 0 444195+ 1478 93238+ 73279+ 1438548+ 28328+ 488488+ 43822 586 0.5 1286847
18281 Wallpaperd 0.1 80.18.42 0 7 1287 178 128K 1264K 378 1 sleeping #0138 0.00000 0.00000 0 444195+ 1478 93238+ 73279+ 1438548+ 28328+ 488488+ 43822 586 0.5 1286847
642 windows 0.1 80.18.42 0 7 1287 178 128K 1264K 378 1 sleeping #0138 0.00000 0.00000 0 444195+ 1478 93238+ 73279+ 1438548+ 28328+ 488488+ 43822 586 0.5 1286847
808 xterm-256col 0.1 80.18.42 0 7 1287 178 128K 1264K 378 1 sleeping #0138 0.00000 0.00000 0 444195+ 1478 93238+ 73279+ 1438548+ 28328+ 488488+ 43822 586 0.5 1286847
928 xterm-256col 0.1 80.18.42 0 7 1287 178 128K 1264K 378 1 sleeping #0138 0.00000 0.00000 0 444195+ 1478 93238+ 73279+ 1438548+ 28328+ 488488+ 43822 586 0.5 1286847
18281 Wallpaperd 0.1 80.18.42 0 7 1287 178 128K 1264K 378 1 sleeping #0138 0.00000 0.00000 0 444195+ 1478 93238+ 73279+ 1438548+ 28
```

```

Last login: Mon Apr 27 14:16:21 on ttys000
andreea@MacBookAir ~ % ifconfig
lo0: flags=8049<UP,LOOPBACK,RUNNING,MULTICAST> mtu 16384
    options=1203<RXCSUM, TXCSUM, TXSTATUS, SW_TIMESTAMP>
    inet 127.0.0.1 netmask 0xff000000
    inet6 ::1 prefixlen 128
    inet6 fe80::1%lo0 prefixlen 64 scopeid 0x1
    nd6 options=201<PERFORMNUD,DAD>
gif0: flags=8010<POINTOPOINT,MULTICAST> mtu 1280
stf0: flags=0<> mtu 1280
anpi1: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=400<CHANNEL_IO>
    ether 6e:ba:1f:24:e0:e3
    media: none
    status: inactive
anpi0: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=400<CHANNEL_IO>
    ether 6e:ba:1f:24:e0:e2
    media: none
    status: inactive
en3: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=400<CHANNEL_IO>
    ether 6e:ba:1f:24:e0:c2
    nd6 options=201<PERFORMNUD,DAD>
    media: none
    status: inactive
en4: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=400<CHANNEL_IO>
    ether 6e:ba:1f:24:e0:c3
    nd6 options=201<PERFORMNUD,DAD>
    media: none
    status: inactive
en1: flags=8963<UP,BROADCAST,SMART,RUNNING,PROMISC,SIMPLEX,MULTICAST> mtu 1500
    options=460<TS04,TS06,CHANNEL_IO>
    ether 36:70:82:56:6b:40
    media: autoselect <full-duplex>
    status: inactive
en2: flags=8963<UP,BROADCAST,SMART,RUNNING,PROMISC,SIMPLEX,MULTICAST> mtu 1500
    options=460<TS04,TS06,CHANNEL_IO>
    ether 36:70:82:56:6b:44
    media: autoselect <full-duplex>
    status: inactive
bridge0: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=63<RXCSUM, TXCSUM, TS04, TS06>
    ether 36:70:82:56:6b:40
    Configuration:
        id 0:0:0:0:0:0 priority 0 hellotime 0 fwddelay 0
        maxage 0 holdcnt 0 proto stp maxaddr 100 timeout 1200
        root id 0:0:0:0:0:0 priority 0 ifcost 0 port 0
        ipfilter disabled flags 0x0
    member: en1 flags=3<LEARNING,DISCOVER>
        ifmaxaddr 0 port 8 priority 0 path cost 0
    member: en2 flags=3<LEARNING,DISCOVER>
        ifmaxaddr 0 port 9 priority 0 path cost 0
    nd6 options=201<PERFORMNUD,DAD>
    media: <unknown type>
    status: inactive
utun0: flags=8051<UP,POINTOPOINT,RUNNING,MULTICAST> mtu 1500
    inet6 fe80::5773:b791:acd2:c25e%utun0 prefixlen 64 scopeid 0xd
    nd6 options=201<PERFORMNUD,DAD>
api1: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=6460<TS04,TS06,CHANNEL_IO,PARTIAL_CSUM,ZEROINVERT_CSUM>
    ether b2:04:e1:ef:e0:a9
    nd6 options=201<PERFORMNUD,DAD>
    media: autoselect (none)
    status: inactive
en0: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
    options=6460<TS04,TS06,CHANNEL_IO,PARTIAL_CSUM,ZEROINVERT_CSUM>
    ether 7e:9a:5b:1d:20:6b
    inet6 fe80::a0:4483:fa4e:c6b6%en0 prefixlen 64 secured scopeid 0xb
    inet 192.168.1.15 netmask 0xfffff000 broadcast 192.168.1.255
    nd6 options=201<PERFORMNUD,DAD>
    media: autoselect
    status: active

```

```

andreea@MacBookAir ~ % whoami
andreea
andreea@MacBookAir ~ % █

```

```

andreea@MacBookAir ~ % crontab -l
crontab: no crontab for andreea
andreea@MacBookAir ~ % █

```

4. Use of Windows OS scripts.

```
C:\users\user > script1.bat
```

Enter you name:

Andreea

Hello Andreea

```
C: \users\user > script 2.bat
```

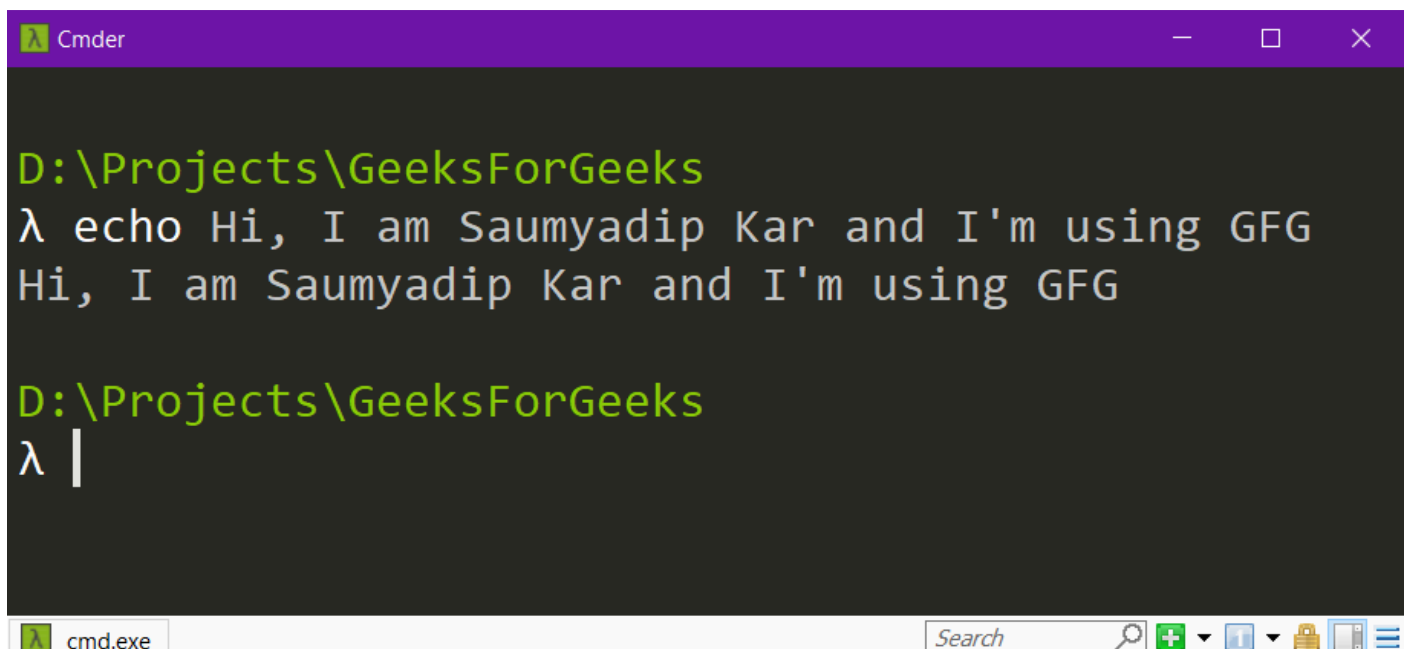
Number 1

Number 2

Number 3

Number 4

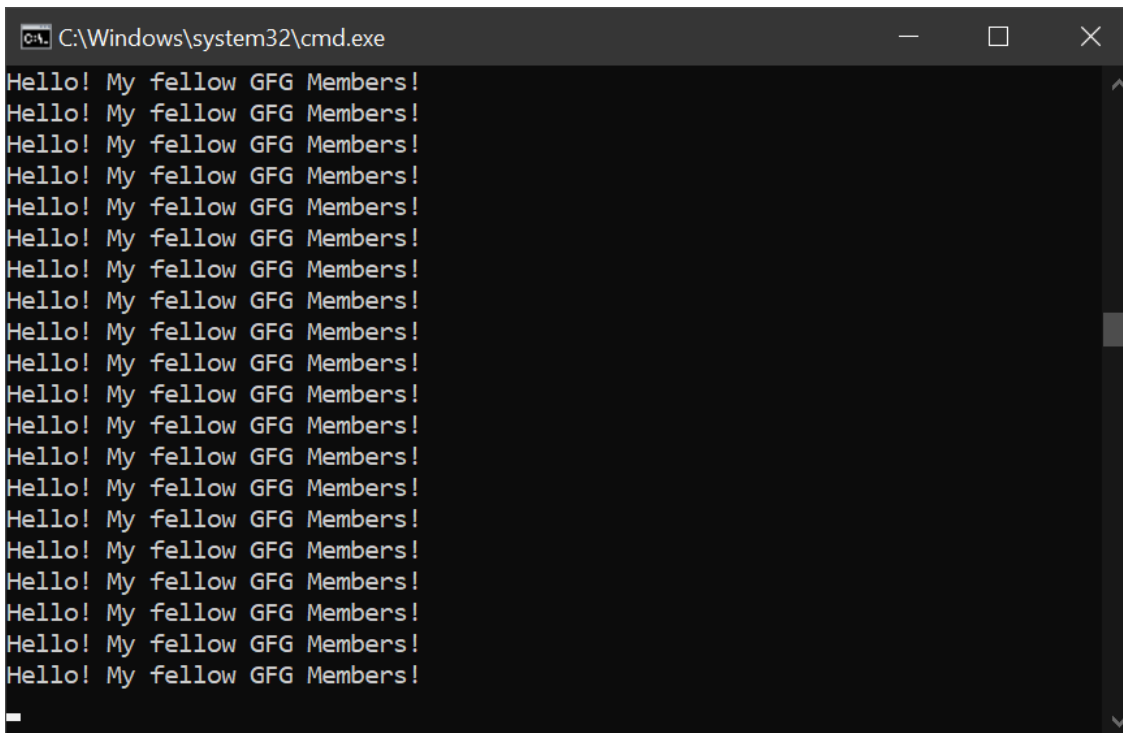
Number 5



```
D:\Projects\GeeksForGeeks
λ echo Hi, I am Saumyadip Kar and I'm using GFG
Hi, I am Saumyadip Kar and I'm using GFG

D:\Projects\GeeksForGeeks
λ |
```

Figure 5 source from [geeksforgeeks](https://www.geeksforgeeks.org/)



```
C:\Windows\system32\cmd.exe
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
Hello! My fellow GFG Members!
```

Figure 6 source from [geeksforgeeks](#)

These scripts demonstrate windows batch scripting. The first script takes user input and displays it, while the second script uses a loop to automate repetitive tasks. These scripts were not executed as the system used is not a windows environment; therefore, example output is provided.

5. Use of Linux OS scripts.

```
Last login: Mon Apr 27 21:29:12 on ttys000
[andreea@MacBookAir ~ % nano script1.sh
[andreea@MacBookAir ~ % chmod +x script1.sh
[andreea@MacBookAir ~ % ./script1.sh
Enter your name:
andreea
hello andreea
```

```
[andreea@MacBookAir ~ % nano script2.sh

[andreea@MacBookAir ~ % chmod +x script2.sh
[andreea@MacBookAir ~ % ./script2.sh
number 1
number 2
number 3
number 4
number 5
```

Script 1 – this script prompts the user their name using read command. The input is stored in a variable and displayed using the echo command. This demonstrates how scripts can interact with user input

Script 2 – this script uses for a loop to display number from 1 to 5. It demonstrates how repetition can be automated using scripted, reducing manual effort.

Conclusion

In conclusion, operating systems play a vital role in managing computer hardware and software resources efficiently. This assignment explored the key functions of operating systems, including process management, memory management, file system organization, device management, and security. These functions ensure that systems run smoothly and provide a stable environment for users and applications [8].

The use of command line interface (CLI) commands in both Windows and Linux – based systems demonstrated how tasks such as process monitoring, file management, network troubleshooting, user management, and task scheduling can be performed efficiently without relying on graphical interfaces. This highlights the importance of CLI tools in system administration and everyday computing [2].

Furthermore, scripting was explored through both Windows batch scripts and Linux bash scripts. These scripts demonstrated how repetitive tasks can be automated using user input and loops, improving efficiency and reducing manual effort. Scripting is an essential skill for managing operating systems effectively [5].

Overall, this assignment shows CLI commands and scripting are powerful tools that provide greater control, flexibility, and efficiency when working with operating systems, making them valuable for both users and IT professionals [8].

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Appendices