



National Textile University

Department of Computer Science

Subject: Operating System

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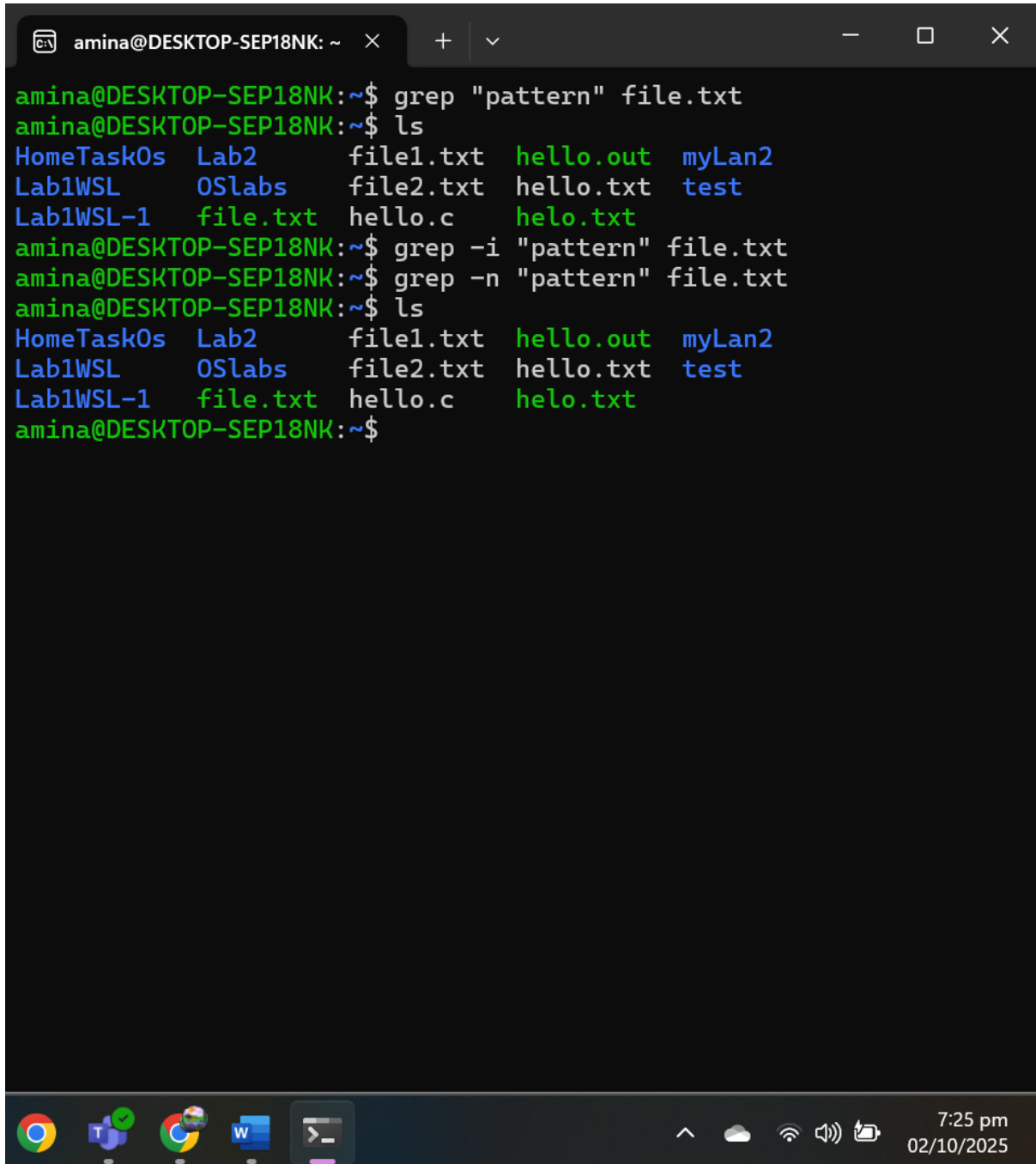
Part 5: Text Processing and Utilities

5.1 Essential Text Commands

- Commands to demonstrate:

```
grep "pattern" file.txt      # Search for patterns
grep -i "pattern" file.txt   # Case-insensitive search
grep -n "pattern" file.txt   # Show line numbers
```

Output:



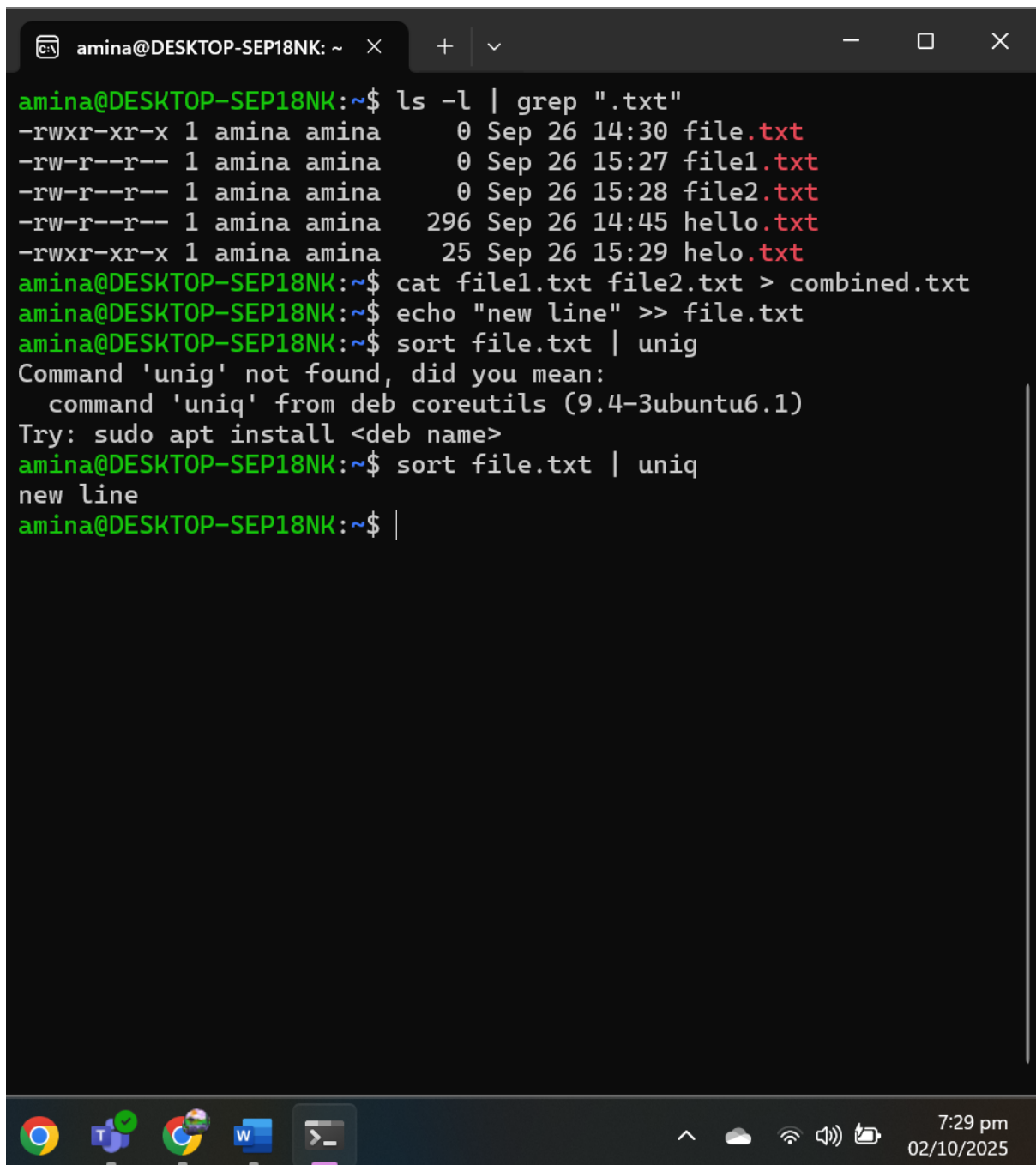
```
amina@DESKTOP-SEP18NK: ~$ grep "pattern" file.txt
amina@DESKTOP-SEP18NK:~$ ls
HomeTask0s  Lab2      file1.txt  hello.out  myLan2
Lab1WSL     OSlabs    file2.txt  hello.txt  test
Lab1WSL-1   file.txt  hello.c    helo.txt
amina@DESKTOP-SEP18NK:~$ grep -i "pattern" file.txt
amina@DESKTOP-SEP18NK:~$ grep -n "pattern" file.txt
amina@DESKTOP-SEP18NK:~$ ls
HomeTask0s  Lab2      file1.txt  hello.out  myLan2
Lab1WSL     OSlabs    file2.txt  hello.txt  test
Lab1WSL-1   file.txt  hello.c    helo.txt
amina@DESKTOP-SEP18NK:~$
```

5.2 Pipes and Redirection

- Concepts and commands:

```
ls -l | grep ".txt"           # Pipe output
cat file1.txt file2.txt > combined.txt # Redirect output
echo "new line" >> file.txt # Append to file
sort file.txt | uniq          # Chain commands
```

Output:



```
amina@DESKTOP-SEP18NK: ~$ ls -l | grep ".txt"
-rwxr-xr-x 1 amina amina  0 Sep 26 14:30 file.txt
-rw-r--r-- 1 amina amina  0 Sep 26 15:27 file1.txt
-rw-r--r-- 1 amina amina  0 Sep 26 15:28 file2.txt
-rw-r--r-- 1 amina amina 296 Sep 26 14:45 hello.txt
-rwxr-xr-x 1 amina amina 25 Sep 26 15:29 helo.txt
amina@DESKTOP-SEP18NK:~$ cat file1.txt file2.txt > combined.txt
amina@DESKTOP-SEP18NK:~$ echo "new line" >> file.txt
amina@DESKTOP-SEP18NK:~$ sort file.txt | uniq
Command 'uniq' not found, did you mean:
  command 'uniq' from deb coreutils (9.4-3ubuntu6.1)
Try: sudo apt install <deb name>
amina@DESKTOP-SEP18NK:~$ sort file.txt | uniq
new line
amina@DESKTOP-SEP18NK:~$ |
```

Part 6: Introduction to Processes

6.1 Understanding Processes

- **Concepts to Cover:**
 - What is a process?
 - Process ID (PID)
 - Parent-child relationships
 - Process states
- **Commands to demonstrate:**

```
ps                # Show current processes
ps aux           # Detailed process list
ps -ef          # Full format listing
pstree           # Process tree
top              # Real-time process viewer
htop             # Enhanced process viewer (if available)
kill PID         # Terminate process by PID
killall process_name # Kill processes by name
pkill pattern    # Kill processes matching pattern
```

Output:

```
amina@DESKTOP-SEP18NK: ~  
amina@DESKTOP-SEP18NK:~$ ps  
  PID TTY          TIME CMD  
  337 pts/0    00:00:00 bash  
  663 pts/0    00:00:00 ps  
amina@DESKTOP-SEP18NK:~$ ps aux  
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND  
root         1   0.1  0.1  21700 12264 ?        Ss   19:23   0:00 /sbin/init  
root         2   0.0  0.0   3072  1792 ?        Sl   19:23   0:00 /init  
root         8   0.0  0.0   3072  1792 ?        Sl   19:23   0:00 plan9 --control-socket 7 --log-le  
vel 4 --server-fd 8 --pipe-f  
root        44   0.0  0.2  58552 18760 ?        S<s  19:23   0:00 /usr/lib/systemd/systemd-journald  
root        93   0.0  0.0  25272  6272 ?        Ss   19:23   0:00 /usr/lib/systemd/systemd-udevd  
systemd+   106   0.0  0.1  21456 12416 ?        Ss   19:23   0:00 /usr/lib/systemd/systemd-resolved  
systemd+   107   0.0  0.0  91024  7808 ?        Ssl  19:23   0:00 /usr/lib/systemd/systemd-timesync  
d  
root       159   0.0  0.0   4236  2560 ?        Ss   19:23   0:00 /usr/sbin/cron -f -P  
message+   160   0.0  0.0   9632  4992 ?        Ss   19:23   0:00 @dbus-daemon --system --address=s  
ystemd: --nofork --nopidfile  
root       183   0.0  0.1  17968  8320 ?        Ss   19:23   0:00 /usr/lib/systemd/systemd-logind  
root       205   0.0  0.1 1755840 11904 ?        Ssl  19:23   0:00 /usr/libexec/wsl-pro-service -vv  
syslog     220   0.0  0.0  222508  5632 ?        Ssl  19:23   0:00 /usr/sbin/rsyslogd -n -iNONE  
root       230   0.0  0.0   3160  1920 hvc0    Ss+  19:23   0:00 /sbin/agetty -o -p -- \u --noclea  
r --keep-baud - 115200,38400  
root       243   0.0  0.0   3116  1792 tty1    Ss+  19:23   0:00 /sbin/agetty -o -p -- \u --noclea  
r - linux  
root       265   0.0  0.2 107032 22528 ?        Ssl  19:23   0:00 /usr/bin/python3 /usr/share/unatt  
ended-upgrades/unattended-up  
root       329   0.0  0.0   3076   896 ?        Ss   19:23   0:00 /init  
root       332   0.0  0.0   3092  1152 ?        S   19:23   0:00 /init  
amina     337   0.0  0.0   6072  5248 pts/0    Ss   19:23   0:00 -bash  
root     343   0.0  0.0   6824  4224 pts/1    Ss   19:23   0:00 /bin/login -f  
amina     395   0.0  0.1  20312 11264 ?        Ss   19:23   0:00 /usr/lib/systemd/systemd --user  
amina     397   0.0  0.0  21152  3520 ?        S   19:23   0:00 (sd-pam)  
amina     422   0.0  0.0   6072  4992 pts/1    S+   19:23   0:00 -bash  
amina     664   0.0  0.0   8280  4096 pts/0    R+   19:33   0:00 ps aux  
amina@DESKTOP-SEP18NK:~$ |
```

```
amina@DESKTOP-SEP18NK: ~$ ps -ef
UID          PID    PPID  C STIME TTY          TIME CMD
root           1        0  0 19:23 ?           00:00:00 /sbin/init
root           2          1  0 19:23 ?           00:00:00 /init
root           8          2  0 19:23 ?           00:00:00 plan9 --cont
root          44          1  0 19:23 ?           00:00:00 /usr/lib/sys
root          93          1  0 19:23 ?           00:00:00 /usr/lib/sys
systemd+     106          1  0 19:23 ?           00:00:00 /usr/lib/sys
systemd+     107          1  0 19:23 ?           00:00:00 /usr/lib/sys
root        159          1  0 19:23 ?           00:00:00 /usr/sbin/cr
message+     160          1  0 19:23 ?           00:00:00 @dbus-daemon
root        183          1  0 19:23 ?           00:00:00 /usr/lib/sys
root        205          1  0 19:23 ?           00:00:00 /usr/libexec
syslog       220          1  0 19:23 ?           00:00:00 /usr/sbin/rs
root        230          1  0 19:23 hvc0        00:00:00 /sbin/agetty
root        243          1  0 19:23 tty1        00:00:00 /sbin/agetty
root        265          1  0 19:23 ?           00:00:00 /usr/bin/pyt
root        329          2  0 19:23 ?           00:00:00 /init
root        332        329  0 19:23 ?           00:00:00 /init
amina       337        332  0 19:23 pts/0        00:00:00 -bash
root        343          2  0 19:23 pts/1        00:00:00 /bin/login -
amina       395          1  0 19:23 ?           00:00:00 /usr/lib/sys
amina       397        395  0 19:23 ?           00:00:00 (sd-pam)
amina       422        343  0 19:23 pts/1        00:00:00 -bash
amina       667        337  0 19:33 pts/0        00:00:00 ps -ef
amina@DESKTOP-SEP18NK:~$
```

```
amina@DESKTOP-SEP18NK: ~$ pstree
systemd--2*[agetty]
      |
      |--cron
      |--dbus-daemon
      |--init-systemd(Ubuntu)---SessionLeader---Relay(337)---bash--+
++
      |
      |--rsyslogd---3*[{rsyslogd}]
      |--systemd---(sd-pam)
      |--systemd-journal
      |--systemd-logind
      |--systemd-resolve
      |--systemd-timesyn---{systemd-timesyn}
      |--systemd-udev
      |--unattended-upgr---{unattended-upgr}
      |--wsl-pro-service---7*[{wsl-pro-service}]
      |
      |--init---{init}
      |--login---bash
      |--{init-systemd(Ubuntu)}
      |
      |--rsyslogd---3*[{rsyslogd}]
      |--systemd---(sd-pam)
      |--systemd-journal
      |--systemd-logind
      |--systemd-resolve
      |--systemd-timesyn---{systemd-timesyn}
      |--systemd-udev
      |--unattended-upgr---{unattended-upgr}
      |--wsl-pro-service---7*[{wsl-pro-service}]
```

```
├─systemd-udev
├─unattended-upgr─{unattended-upgr}
└─wsl-pro-service─7*[{wsl-pro-service}]
```

amina@DESKTOP-SEP18NK:~\$ top

top - 19:34:55 up 11 min, 1 user, load average: 0.00, 0.00, 0
Tasks: 23 total, 1 running, 22 sleeping, 0 stopped, 0 z
%Cpu(s): 0.0 us, 0.2 sy, 0.0 ni, 99.8 id, 0.0 wa, 0.0 hi,
MiB Mem : 7846.2 total, 7414.7 free, 461.8 used, 106.
MiB Swap: 2048.0 total, 2048.0 free, 0.0 used. 7384.

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM
1	root	20	0	21700	12264	9192	S	0.0	0.2
2	root	20	0	3072	1792	1792	S	0.0	0.0
8	root	20	0	3072	1792	1792	S	0.0	0.0
44	root	19	-1	66748	18760	17992	S	0.0	0.2
93	root	20	0	25272	6272	4864	S	0.0	0.1
106	systemd+	20	0	21456	12416	10368	S	0.0	0.2
107	systemd+	20	0	91024	7808	6912	S	0.0	0.1
159	root	20	0	4236	2560	2432	S	0.0	0.0
160	message+	20	0	9632	4992	4480	S	0.0	0.1
183	root	20	0	17968	8320	7424	S	0.0	0.1
205	root	20	0	1755840	11904	10240	S	0.0	0.1
220	syslog	20	0	222508	5632	4480	S	0.0	0.1
230	root	20	0	3160	1920	1792	S	0.0	0.0
243	root	20	0	3116	1792	1664	S	0.0	0.0
265	root	20	0	107032	22528	13312	S	0.0	0.3
329	root	20	0	3076	896	896	S	0.0	0.0
332	root	20	0	3092	1152	1024	S	0.0	0.0
337	amina	20	0	6072	5248	3584	S	0.0	0.1
343	root	20	0	6824	4224	3712	S	0.0	0.1
395	amina	20	0	20312	11264	9216	S	0.0	0.1
397	amina	20	0	21152	3520	1792	S	0.0	0.0




```
amina@DESKTOP-SEP18NK: ~ × + v - □ ×
amina@DESKTOP-SEP18NK:~$ kill PID
-bash: kill: PID: arguments must be process or job IDs
amina@DESKTOP-SEP18NK:~$ kill process_name
-bash: kill: process_name: arguments must be process or job IDs
amina@DESKTOP-SEP18NK:~$ pkill pattern
amina@DESKTOP-SEP18NK:~$ |
```

