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Batch: F1

Subject: Operating System (OS)

Subject Code: 2CS506

Practical 1

Types of shells:

Bash, Zsh, Bsh, Ksh, Tcsh, Dash, Ash, Csh

1. Who: Gives information about the user

```
swekit@swekit:~$ who
swekit    seat0          2024-01-30 00:27 (login screen)
swekit    tty2            2024-01-30 00:27 (tty2)
swekit@swekit:~$
```

2. who am I: Current username and other details

```
swekit@swekit:~$ whoami
swekit
swekit@swekit:~$
```

3. touch: updates the access and modification times of each file and can create a new empty file

```
swekit@swekit:~$ cd Desktop
swekit@swekit:~/Desktop$ ls -l
total 0
swekit@swekit:~/Desktop$ touch f1
swekit@swekit:~/Desktop$ ls
f1
swekit@swekit:~/Desktop$ ls
f1
swekit@swekit:~/Desktop$ ls -l
total 0
-rw-rw-r-- 1 swekit swekit 0 Jan 30 00:35 f1
swekit@swekit:~/Desktop$
```

4. cat: reads each File parameter in sequence and writes it to standard output

```
swekit@swekit:~/Desktop$ mkdir d1
swekit@swekit:~/Desktop$ ls
d1  f1
swekit@swekit:~/Desktop$ cd d1
swekit@swekit:~/Desktop/d1$ cat > f2
hi hello
how are you?
^Z
[1]+  Stopped                  cat > f2
swekit@swekit:~/Desktop/d1$ cat f2
hi hello
how are you?
swekit@swekit:~/Desktop/d1$ cat <f1 > f2
bash: f1: No such file or directory
swekit@swekit:~/Desktop/d1$ cat <f2> f3
swekit@swekit:~/Desktop/d1$ cat f3
hi hello
how are you?
swekit@swekit:~/Desktop/d1$
```

```
swekit@swekit:~/Desktop/d1$ cat f2>>f3
swekit@swekit:~/Desktop/d1$ cat f2
hi hello
how are you?
swekit@swekit:~/Desktop/d1$ cat f3
hi hello
how are you?
hi hello
how are you?
swekit@swekit:~/Desktop/d1$
```

5. cp: Copy

```
swekit@swekit:~/Desktop/d1$ cat > f4
^Z
[2]+  Stopped                  cat > f4
swekit@swekit:~/Desktop/d1$ cp f2 f4
swekit@swekit:~/Desktop/d1$ cat f4
hi hello
how are you?
swekit@swekit:~/Desktop/d1$
```

6. rm: remove file

```
swekit@swekit:~/Desktop/d1$ ls
f2  f3  f4
swekit@swekit:~/Desktop/d1$ rm f3
swekit@swekit:~/Desktop/d1$ ls
f2  f4
swekit@swekit:~/Desktop/d1$
```

7. mv: move

```
swekit@swekit:~/Desktop/d1$ cd ..
swekit@swekit:~/Desktop$ ls
d1  f1
swekit@swekit:~/Desktop$ mv f1 d1
swekit@swekit:~/Desktop$ ls
d1
swekit@swekit:~/Desktop$
```

8. ls: Lists all files and directories of directory

```
swekit@swekit:~/Desktop/d1$ cd ..
swekit@swekit:~/Desktop$ ls
d1  f1
swekit@swekit:~/Desktop$ mv f1 d1
swekit@swekit:~/Desktop$ ls
d1
swekit@swekit:~/Desktop$
```

9. ln: Links file

```
swekit@swekit:~/Desktop$ ln f2 d1/f1
ln: failed to create hard link 'd1/f1': File exists
swekit@swekit:~/Desktop$ ln f2 d1
swekit@swekit:~/Desktop$ ls d1
f1  f2
swekit@swekit:~/Desktop$
```

10. chmod: the command and system call used to change the access permissions

```
swekit@swekit:~/Desktop$ ls -l
total 4
drwxrwxr-x 2 swekit swekit 4096 Jan 30 00:48 d1
-rw-rw-r-- 2 swekit swekit    0 Jan 30 00:47 f2
swekit@swekit:~/Desktop$ chmod 777 f2
swekit@swekit:~/Desktop$ ls -l
total 4
drwxrwxr-x 2 swekit swekit 4096 Jan 30 00:48 d1
-rwxrwxrwx 2 swekit swekit    0 Jan 30 00:47 f2
swekit@swekit:~/Desktop$ chmod 567 d1
swekit@swekit:~/Desktop$ ls -l
total 4
dr-xrw-rwx 2 swekit swekit 4096 Jan 30 00:48 d1
-rwxrwxrwx 2 swekit swekit    0 Jan 30 00:47 f2
swekit@swekit:~/Desktop$
```

User-4 Group-2 Other-1

11. umask: determines new creating file permission

```
swekit@swekit:~/Desktop$ umask 0022
swekit@swekit:~/Desktop$ umask 2222
swekit@swekit:~/Desktop$ ls -l
total 4
dr-xrw-rwx 2 swekit swekit 4096 Jan 30 00:48 d1
-rwxrwxrwx 2 swekit swekit    0 Jan 30 00:47 f2
swekit@swekit:~/Desktop$
```

12. pwd: Path of the current directory

```
swekit@swekit:~/Desktop$ pwd
/home/swekit/Desktop
swekit@swekit:~/Desktop$
```

13. mkdir: creates new directory

```
swekit@swekit:~/Desktop$ ls
d1 d2 f2
swekit@swekit:~/Desktop$
```

14. rmdir: removes directory

```
swekit@swekit:~/Desktop$ rmdir d2
swekit@swekit:~/Desktop$ ls
d1  f2
swekit@swekit:~/Desktop$
```

15. cd : change directory

```
swekit@swekit:~/Desktop$ cd d1
swekit@swekit:~/Desktop/d1$ pwd
/home/swekit/Desktop/d1
swekit@swekit:~/Desktop/d1$
```

16. bc: basic calculator

17. bc -l: Sets scale (see the SYNTAX section) to 20 and loads the included math library and the extended math library before running any code, including any expressions or files specified on the command line.

18. expr: By we can do an arithmetic operation

```
swekit@swekit:~/Desktop/d1$ expr 10 + 10
20
swekit@swekit:~/Desktop/d1$ expr 10 \* 10
100
swekit@swekit:~/Desktop/d1$ expr 10 - 10
0
swekit@swekit:~/Desktop/d1$
```

19. factor: Gives all factor elements

Ex. >>> factor 100 (Will give) 100: 2 2 5 5

20. logname: Displays login name of current process

```
swekit@swekit:~/Desktop/d1$ logname  
swekit  
swekit@swekit:~/Desktop/d1$
```

21. uname: All information of system

```
swekit@swekit:~/Desktop/d1$ uname  
Linux  
swekit@swekit:~/Desktop/d1$
```

22. tty: writes the name of your terminal to standard output

```
swekit@swekit:~/Desktop/d1$ tty  
/dev/pts/1  
swekit@swekit:~/Desktop/d1$
```

23. date

```
swekit@swekit:~/Desktop/d1$ date  
Tue Jan 30 01:03:50 AM IST 2024  
swekit@swekit:~/Desktop/d1$
```

24. df: displays information about total space and available space on a file system

```
swekit@swekit:~/Desktop/d1$ df  
Filesystem      1K-blocks    Used Available Use% Mounted on  
tmpfs           400016      1632   398384    1% /run  
/dev/sda2       25623780 10076476 14220356   42% /  
tmpfs           2000068        0  2000068    0% /dev/shm  
tmpfs           5120         8     5112    1% /run/lock  
tmpfs           400012      168   399844    1% /run/user/1000  
swekit@swekit:~/Desktop/d1$
```

25. du: Displays the number of blocks used for files

```
swekit@swekit:~/Desktop/d1$ du
4      .
swekit@swekit:~/Desktop/d1$
```

26. ulimit: can be used in shell scripts to set resource limits for the script -Can set file limit which can not be exceeded

```
swekit@swekit:~/Desktop/d1$ ulimit
unlimited
swekit@swekit:~/Desktop/d1$
```

27. cal: calendar

```
swekit@swekit:~/Desktop/d1$ cal
      January 2024
Su Mo Tu We Th Fr Sa
    1  2  3  4  5  6
 7  8  9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30 31
```

28. wc: wc command counts the number of lines, words, and bytes in the files specified by the File parameter

```
swekit@swekit:~/Desktop/d1$ cat > f2
hi
^Z
[7]+  Stopped                  cat > f2
swekit@swekit:~/Desktop/d1$ wc f2
1 1 3 f2
swekit@swekit:~/Desktop/d1$ wc -l f2
1 f2
swekit@swekit:~/Desktop/d1$
```


29. sort – arrange in order ascending

```
swekit@swekit:~/Desktop/d1$ cat > f2
carrots:104
lettuce:15
green beans:32
yams:115
^Z
[8]+  Stopped                  cat > f2
swekit@swekit:~/Desktop/d1$ sort f2
carrots:104
green beans:32
lettuce:15
yams:115
```

30. cut – to remove a column

```
swekit@swekit:~/Desktop/d1$ cut -c 4- f2
rots:104
tuce:15
en beans:32
s:115
swekit@swekit:~/Desktop/d1$
```

31. grep – to search for a specific word

```
swekit@swekit:~/Desktop/d1$ grep "green" f2
green beans:32
swekit@swekit:~/Desktop/d1$
```

32. awk: pattern searching

```
swekit@swekit:~/Desktop/d1$ awk '{print $0}' f2
carrots:104
lettuce:15
green beans:32
yams:115
swekit@swekit:~/Desktop/d1$
```

33. head: Gives title to file for elaborate

```
swekit@swekit:~/Desktop/d1$ head f1 f2
==> f1 <==
hello
world

==> f2 <==
carrots:104
lettuce:15
green beans:32
yams:115
swekit@swekit:~/Desktop/d1$
```

34. pg: read the files named in the File parameter and write them to standard output one screen at a time

35. more: reads files and displays the text one screen at a time. The command pauses after each screen and prints the word More at the bottom of the screen

36. tail: writes the file specified by the File parameter to standard output beginning at a specified point

```
swekit@swekit:~/Desktop/d1$ tail f1 f2
==> f1 <==
hello
world

==> f2 <==
carrots:104
lettuce:15
green beans:32
yams:115
swekit@swekit:~/Desktop/d1$
```

37. pipe: Connects different commands

```
swekit@swekit:~/Desktop/d1$ cat <f1 | cat >f2
swekit@swekit:~/Desktop/d1$ ls
f1  f2
swekit@swekit:~/Desktop/d1$ cat f2
hello
world
swekit@swekit:~/Desktop/d1$
```

38. tee: Reads standard input and gives two output direction

```
swekit@swekit:~/Desktop/d1$ ls -l | tee -a f2
total 8
-rw-rw-r-- 1 swekit swekit 12 Jan 30 01:18 f1
-rwxrwxrwx 2 swekit swekit 12 Jan 30 01:22 f2
swekit@swekit:~/Desktop/d1$
```

39. ps: Shows currently running process

```

swekit@swekit:~/Desktop/d1$ ps
  PID TTY          TIME CMD
 3837 pts/1    00:00:00 bash
 3946 pts/1    00:00:00 cat
 4003 pts/1    00:00:00 cat
 4110 pts/1    00:00:00 cat
 4118 pts/1    00:00:00 cat
 4170 pts/1    00:00:00 bc
 4171 pts/1    00:00:00 bc
 4322 pts/1    00:00:00 cat
 4340 pts/1    00:00:00 cat
 4397 pts/1    00:00:00 cat
 4452 pts/1    00:00:00 ps
swekit@swekit:~/Desktop/d1$

```

40. kill: To terminate the process

```

swekit@swekit:~/Desktop/d1$ kill -l
 1) SIGHUP      2) SIGINT      3) SIGQUIT     4) SIGILL      5) SIGTRAP
 6) SIGABRT     7) SIGBUS     8) SIGFPE      9) SIGKILL     10) SIGUSR1
11) SIGSEGV    12) SIGUSR2    13) SIGPIPE    14) SIGALRM     15) SIGTERM
16) SIGSTKFLT  17) SIGCHLD   18) SIGCONT    19) SIGSTOP     20) SIGTSTP
21) SIGTTIN    22) SIGTTOU   23) SIGURG     24) SIGXCPU     25) SIGXFSZ
26) SIGVTALRM  27) SIGPROF   28) SIGWINCH   29) SIGIO        30) SIGPWR
31) SIGSYS     34) SIGRTMIN   35) SIGRTMIN+1 36) SIGRTMIN+2 37) SIGRTMIN+3
38) SIGRTMIN+4 39) SIGRTMIN+5 40) SIGRTMIN+6 41) SIGRTMIN+7 42) SIGRTMIN+8
43) SIGRTMIN+9 44) SIGRTMIN+10 45) SIGRTMIN+11 46) SIGRTMIN+12 47) SIGRTMIN+13
48) SIGRTMIN+14 49) SIGRTMIN+15 50) SIGRTMAX-14 51) SIGRTMAX-13 52) SIGRTMAX-12
53) SIGRTMAX-11 54) SIGRTMAX-10 55) SIGRTMAX-9  56) SIGRTMAX-8  57) SIGRTMAX-7
58) SIGRTMAX-6 59) SIGRTMAX-5 60) SIGRTMAX-4  61) SIGRTMAX-3  62) SIGRTMAX-2
63) SIGRTMAX-1 64) SIGRTMAX

```

41. nice: lets you run a command at a priority lower than the command's normal priority

42. read: reads one line from standard input and assigns the values of each field in the input line to a shell variable using the characters in the IFS (Internal Field Separator) variable as separators.

43. echo: Prints argument

```
swekit@swekit:~/Desktop/d1$ echo hello
hello
swekit@swekit:~/Desktop/d1$
```

44. I/O redirection:

```
swekit@swekit:~/Desktop/d1$ ls
f1  f2
swekit@swekit:~/Desktop/d1$ cd ..
swekit@swekit:~/Desktop$ ls
d1  f2
swekit@swekit:~/Desktop$ cat >f2
hi
hello
^Z
[10]+  Stopped                  cat > f2
swekit@swekit:~/Desktop$ ls
d1  f2
swekit@swekit:~/Desktop$ cat <f2 >d1/f1
swekit@swekit:~/Desktop$ ls
d1  f2
swekit@swekit:~/Desktop$ cd d1
swekit@swekit:~/Desktop/d1$ ls
f1  f2
swekit@swekit:~/Desktop/d1$ cat f1
hi
hello
swekit@swekit:~/Desktop/d1$
```