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OS Assignment 2

Q1 : Difference between internal and external commands

A1 :

- Internal commands are built into the shell, and their execution is fast because the shell doesn't have to search the given path for them in the PATH variable, and no process needs to be spawned for executing them. Examples of internal commands include cd, source. NOTE :: In short internal command are not path dependent.
- External commands, on the other hand, are not built into the shell, and they are usually located in /bin or /usr/bin. When an external command has to be executed, the shell looks for its path given in the PATH variable, and a new process has to be spawned for the command to be executed. Examples of external commands include ls and cat NOTE :: In short external command are path dependent.

Q2: Feeding Output of one command to other using pipelining.

A2 : In this pic command used are

cat : for displaying content of file

sort : for sorting element in the file

uniq : for removing out the duplicate elements

```
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ cat > games.txt
GTA
Cyberpunk
RDR 2
Uncharted 4
Rocket League
GTA
Cyberpunk
Destiny 2
Call of Duty
RDR 2
^C
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ cat games.txt | sort games.txt | uniq
Call of Duty
Cyberpunk
Destiny 2
GTA
RDR 2
Rocket League
Uncharted 4
```

Q3 : expr , locate command in linux

A3 : expr : command-line utility that evaluates and displays the output of an expression

```
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ expr 40 / 5
8
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ expr 17 + 37
54
```

```
ashmit@ashmit-ubuntu:~$ locate games.txt
/home/ashmit/Desktop/ashmit/games.txt
ashmit@ashmit-ubuntu:~$ cd Desktop
ashmit@ashmit-ubuntu:~/Desktop$ cd ashmit
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ ls
add.sh  compare.sh  fibonacci.sh  games.txt
ashmit@ashmit-ubuntu:~/Desktop/ashmit$
```

Q4 : echo command

A4 : Echo : displays the string on the prompt. It has its uses in shell script to display the output of the file.

```
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ echo "ashmit is a student from 2CO-17"
ashmit is a student from 2CO-17
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ a=25
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ echo $a
25
```

Q5 : Using . and .. in linux

A5 : "." (dot): refers to the current directory.

".." (dot dot) refers to the parent directory.

```
ashmit@ashmit-ubuntu:~$ cd Desktop
ashmit@ashmit-ubuntu:~/Desktop$ cd ashmit
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ ls .
add.sh      fibonacci.sh  os_info.sh  word_count.sh
compare.sh  fileinfo.sh  switch.sh
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ ls ..
ashmit
ashmit@ashmit-ubuntu:~/Desktop/ashmit$
```

Q6 : Ways of signing off from linux

A6 : Shutdown command: The shutdown command can be used to shut down or reboot the system. The command can be used with various options to specify the time of shutdown, message to be displayed, etc. For example, the command `sudo shutdown -h now` will shut down the system immediately.

Reboot command: The reboot command can be used to reboot the system. The command can be used with various options to specify the time of reboot, message to be displayed, etc. For example, the command `sudo reboot` will reboot the system immediately.

Logout command: The logout command can be used to log out of the current session. This will close all the open applications and terminate the session. For example, the command `logout` will log out of the current session. Ctrl + D: Pressing the Ctrl + D key combination will log out of the current session. This is equivalent to using the `logout` command. SSH: If you are logged in to a remote system using SSH, you can simply close the SSH session to log out. This will not shut down the remote system or terminate any running processes.

Q7 : Ping, man and help command

```
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ ping thapar.edu
PING thapar.edu (117.203.246.106) 56(84) bytes of data:
64 bytes from 117.203.246.106 (117.203.246.106): icmp_seq=1 ttl=128 time=107 ms
64 bytes from 117.203.246.106 (117.203.246.106): icmp_seq=2 ttl=128 time=97.1 ms
64 bytes from 117.203.246.106 (117.203.246.106): icmp_seq=3 ttl=128 time=116 ms
64 bytes from 117.203.246.106 (117.203.246.106): icmp_seq=4 ttl=128 time=138 ms
64 bytes from 117.203.246.106 (117.203.246.106): icmp_seq=5 ttl=128 time=96.0 ms
64 bytes from 117.203.246.106 (117.203.246.106): icmp_seq=6 ttl=128 time=119 ms
^C
--- thapar.edu ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5009ms
rtt min/avg/max/mdev = 96.024/112.134/137.744/14.313 ms
```

```
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ man
\What manual page do you want?
For example, try 'man man'.
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ man man
```



```
MAN(1) Manual pager utils MAN(1)

NAME
man - an interface to the system reference manuals

SYNOPSIS
man [man options] [[section] page ...] ...
man -k [apropos options] regexp ...
man -K [man options] [section] term ...
man -f [whatis options] page ...
man -l [man options] file ...
man -w|-W [man options] page ...

DESCRIPTION
man is the system's manual pager. Each page argument given to man is normally the name of a program, utility or function. The manual page associated with each of these arguments is then found and displayed. A section, if provided, will direct man to look only in that section of the manual. The default action is to search in all of the available sections following a pre-defined order (see DEFAULTS), and to show only the first page found, even if page exists in several sections.

The table below shows the section numbers of the manual followed by the types of pages they contain.

1 Executable programs or shell commands
2 System calls (functions provided by the kernel)
3 Library calls (functions within program libraries)
4 Special files (usually found in /dev)
5 File formats and conventions, e.g. /etc/passwd
6 Games
7 Miscellaneous (including macro packages and conventions), e.g. man(7), groff(7), man-pages(7)
8 System administration commands (usually only for root)
9 Kernel routines [Non standard]
```

```

ashmit@ashmit-ubuntu:~/Desktop/ashmit$ help
GNU bash, version 5.1.16(1)-release (x86_64-pc-linux-gnu)
These shell commands are defined internally. Type 'help' to see this list.
Type 'help name' to find out more about the function 'name'.
Use 'info bash' to find out more about the shell in general.
Use 'man -k' or 'info' to find out more about commands not in this list.

A star (*) next to a name means that the command is disabled.

job_spec [&]
(( expression ))
. filename [arguments]
:
[ arg... ]
[[ expression ]]
alias [-p] [name[=value] ... ]
bg [job_spec ...]
bind [-lpsvPSVX] [-m keymap] [-f filename] [-q name] [-u name] >
break [n]
builtin [shell-builtin [arg ...]]
caller [expr]
case WORD in [PATTERN] [PATTERN]...) COMMANDS ;;)... esac
cd [-L|[-P [-e]] [-@]] [dir]
command [-pVv] command [arg ...]
compgen [-abcdefgjkuv] [-o option] [-A action] [-G globpat] [->
complete [-abcdefgjkuv] [-pr] [-DEI] [-o option] [-A action] [>
compropt [-o]o option] [-DEI] [name ...]
continue [n]
coproc [NAME] command [redirections]
declare [-aAfFgIILnrtux] [-p] [name[=value] ...]
dirs [-clpv] [+N] [-N]
disown [-h] [-ar] [jobspec ... | pid ...]
echo [-neE] [arg ...]
enable [-a] [-dnps] [-f filename] [name ...]
eval [arg ...]
exec [-cl] [-a name] [command [argument ...]] [redirection ...>
exit [n]
export [-fn] [name[=value] ...] or export -p
false
fc [-e ename] [-lnr] [first] [last] or fc -s [pat=rep] [command>
fg [job_spec]
for NAME [in WORDS ... ] ; do COMMANDS; done
for (( exp1; exp2; exp3 )); do COMMANDS; done
function name { COMMANDS : } or name () { COMMANDS : }

history [-c] [-d offset] [n] or history -anrw [filename] or hi>
if COMMANDS; then COMMANDS; [ elif COMMANDS; then COMMANDS; ]>
jobs [-lnprs] [jobspec ...] or jobs -x command [args]
kill [-s sigspec | -n signum | -sigspec] pid | jobspec ... or >
let arg [arg ...]
local [option] name[=value] ...
logout [n]
mapfile [-d delim] [-n count] [-O origin] [-s count] [-t] [-u >
popd [-n] [+N | -N]
printf [-v var] format [arguments]
pushd [-n] [+N | -N | dir]
pwd [-LP]
read [-ers] [-a array] [-d delim] [-i text] [-n nchars] [-N nc>
readarray [-d delim] [-n count] [-O origin] [-s count] [-t] [->
readonly [-aAf] [name[=value] ...] or readonly -p
return [n]
select NAME [in WORDS ... ;] do COMMANDS; done
set [-abefhkmnptuvxBCHP] [-o option-name] [--] [arg ...]
shift [n]
shopt [-pqsu] [-o] [optname ...]
source filename [arguments]
suspend [-f]
test [expr]
time [-p] pipeline
times
trap [-lp] [[arg] signal_spec ...]
true
type [-afptP] name [name ...]
typeset [-aAfFgIILnrtux] [-p] name[=value] ...
ulimit [-SHabcdefiklmnpqrstuvxPT] [limit]
umask [-p] [-S] [mode]
unalias [-a] name [name ...]
unset [-f] [-v] [-n] [name ...]
until COMMANDS; do COMMANDS; done
variables - Names and meanings of some shell variables

```

Q8 : Combining the commands

A8 : Command can be combined using “;”, “&&”, “|”, “&” signs between them.

```

ashmit@ashmit-ubuntu:~/Desktop/ashmit$ ls; cat add.sh; chmod +x add.sh; ./add.sh
add.sh  compare.sh  fibonacci.sh  games.txt
#!/bin/bash
a=10
b=20
sum=$((a+b))
echo "sum is $sum"
sum is 30
ashmit@ashmit-ubuntu:~/Desktop/ashmit$

```

```

ashmit@ashmit-ubuntu:~/Desktop/ashmit$ cd
ashmit@ashmit-ubuntu:~$ mkdir test && cd test
ashmit@ashmit-ubuntu:~/test$

```

```

ashmit@ashmit-ubuntu:~/Desktop$ rmdir test
ashmit@ashmit-ubuntu:~/Desktop$ cd test || cd ashmit
bash: cd: test: No such file or directory
ashmit@ashmit-ubuntu:~/Desktop/ashmit$

```

Q9 : File permission command

A9 :

```
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ ls -lart
total 24
-rwxrwxr-x 1 ashmit ashmit  56 Aug 18 10:31 add.sh
-rwxrwxr-x 1 ashmit ashmit 141 Aug 18 10:57 compare.sh
-rwxrwxr-x 1 ashmit ashmit 132 Aug 18 11:16 fibonacci.sh
drwxrwxr-x 2 ashmit ashmit 4096 Aug 24 22:03 .
-rw-rw-r-- 1 ashmit ashmit  89 Aug 24 22:05 games.txt
drwxr-xr-x 3 ashmit ashmit 4096 Aug 24 22:33 ..
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ chmod +rwx games.txt
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ ls -lart
total 24
-rwxrwxr-x 1 ashmit ashmit  56 Aug 18 10:31 add.sh
-rwxrwxr-x 1 ashmit ashmit 141 Aug 18 10:57 compare.sh
-rwxrwxr-x 1 ashmit ashmit 132 Aug 18 11:16 fibonacci.sh
drwxrwxr-x 2 ashmit ashmit 4096 Aug 24 22:03 .
-rwxrwxr-x 1 ashmit ashmit  89 Aug 24 22:05 games.txt
drwxr-xr-x 3 ashmit ashmit 4096 Aug 24 22:33 ..
ashmit@ashmit-ubuntu:~/Desktop/ashmit$
```

Q10 : vi/ vim editor in linux

A 10 :

```
ashmit@ashmit-ubuntu:~$ cd Desktop
ashmit@ashmit-ubuntu:~/Desktop$ cd ashmit
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ vi test.txt
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ cat test.txt
Hello I am ashmit from TIET, 2CO-17.
```

Q11: grep, sort , ps

A11 : grep : prints line that matches the particular text

```
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ grep "ashmit" test.txt
Hello I am ashmit from TIET, 2CO-17.
```

```
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ cat > games.txt
GTA
Cyberpunk
RDR 2
Uncharted 4
God of war
Call of Duty
Rcoket League
^C
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ sort games.txt
Call of Duty
Cyberpunk
God of war
GTA
Rcoket League
RDR 2
Uncharted 4
ashmit@ashmit-ubuntu:~/Desktop/ashmit$
```

```
ashmit@ashmit-ubuntu:~/Desktop/ashmit$ ps
  PID TTY          TIME CMD
 22609 pts/0    00:00:00 bash
 28540 pts/0    00:00:00 ps
ashmit@ashmit-ubuntu:~/Desktop/ashmit$
```