03_commands

Moatasem Elsayed

Linux commands can be categorized into various groups based on their functionality

1-File and Directory Management
-Help and Documentation

2-File Viewing and Editing

3-Controls:
Redirection,Piping,Wildcard,regex

4-File Permissions:

5-File Compression and Archiving:

6-Text Processing

7-System Information:

8-System Monitoring and Logging

9-search

10-Process Management

11-Networking:

12-User Management:

13-Package Management:

14-System Maintenance:

15-Links

16- FS

2- File Viewing and Editing


```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/Session 3$ cat > hello.txt
hello
welcome
egypt
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/Session 3$ cat hello.txt
hello
welcome
egypt
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/Session 3$
```

vim

Vim is an advanced and highly configurable text editor built to enable efficient text editing. Vim text editor is developed by Bram Moolenaar. It supports most file types and vim editor is also known as a programmer's editor. We can use its plugin based on our needs

> In Vim, you can make the help documentation take up the entire screen by using the `:help` command with the `:only` command

1. **Command Mode(Normal Mode)**
2. **Command-Line Mode**
3. **Insert Mode**
4. **Visual Mode**

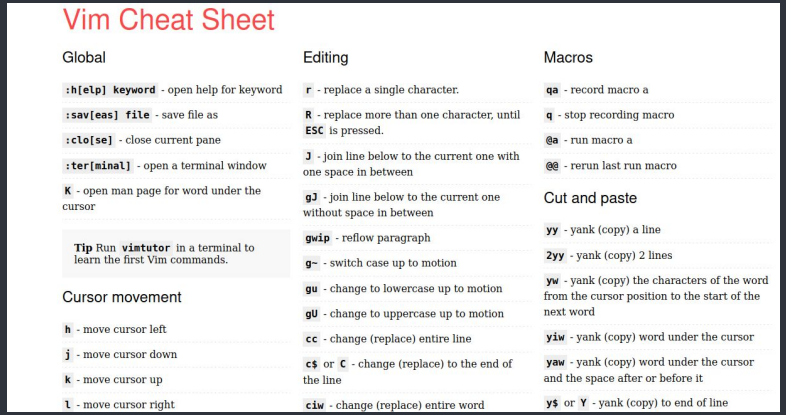
Exit from terminal

```
:q quit
:wq write and quit
:!q quit without saving
:x like :wq
:exit
```

Moving Around in Vim

```
* k   ->   move up                                    ^
* j   ->  move down                                   k
* h   -> move right                          <  h        l >
* l   -> move left                                    j
                                                      v
```

- w, b,e for word navigation
- gg, G for moving to the beginning and end of a file
- { } for paragraph
- 0 → first line
- $→ end of line
- % → () {}
- Number G / number gg→ goto line
- 2w → moves two words
- 10$ move 10 lines
- H - move to top of screen
- M - move to middle of screen
- L - move to bottom of screen



Vim Cheat Sheet

Global

`:h[elp] keyword` - open help for keyword

`:sav[eas] file` - save file as

`:clo[se]` - close current pane

`:ter[minal]` - open a terminal window

`K` - open man page for word under the cursor

Tip Run `vimtutor` in a terminal to learn the first Vim commands.

Cursor movement

`h` - move cursor left

`j` - move cursor down

`k` - move cursor up

`l` - move cursor right

Editing

`r` - replace a single character.

`R` - replace more than one character, until `ESC` is pressed.

`J` - join line below to the current one with one space in between

`gJ` - join line below to the current one without space in between

`gwip` - reflow paragraph

`g~` - switch case up to motion

`gu` - change to lowercase up to motion

`gU` - change to uppercase up to motion

`cc` - change (replace) entire line

`c$` or `C` - change (replace) to the end of the line

`ciw` - change (replace) entire word

Macros

`qa` - record macro a

`q` - stop recording macro

`@a` - run macro a

`@@` - rerun last run macro

Cut and paste

`yy` - yank (copy) a line

`2yy` - yank (copy) 2 lines

`yw` - yank (copy) the characters of the word from the cursor position to the start of the next word

`yiw` - yank (copy) word under the cursor

`yaw` - yank (copy) word under the cursor and the space after or before it

`y$` or `Y` - yank (copy) to end of line

Inserting Mode

- i - insert before the cursor
- I - insert at the beginning of the line
- a - insert (append) after the cursor
- A - insert (append) at the end of the line
- o - append (open) a new line below the current line
- O - append (open) a new line above the current line

- Ctrl + t - indent (move right) line one shiftwidth during insert mode
- Ctrl + d - de-indent (move left) line one shiftwidth during insert mode
- Esc or Ctrl + c - exit insert mode

Editing Text

- **r** – replace a single character (and return to command mode)
- R - replace more than one character, until ESC is pressed.
- ciw - change (replace) entire word
- **cc** – replace an entire line (deletes the line and moves into insert mode)
- **C** / **c$** – replace from the cursor to the end of a line
- **cw** – replace from the cursor to the end of a word
- **u** – undo
- **Ctrl** + **r** – redo
- **.** – repeat last command
- p - put (paste) the clipboard after cursor
- P - put (paste) before cursor
- yy - yank (copy) a line

Marking text (visual mode)

- v - start visual mode, mark lines, then do a command (like y-yank)
- V - start linewise visual mode
- Ctrl + v - start visual block mode
- aw - mark a word
- ab - a block with ()
- aB - a block with {}
- at - a block with <> tags
- ib - inner block with ()
- iB - inner block with {}
- it - inner block with <> tags

commands

- :3,5d - delete lines starting from 3 to 5
- :g/{pattern}/d - delete all lines containing pattern
- :g!/{pattern}/d - delete all lines not containing pattern
- :%s/searchword/replaceword/g
- :%s/searchword/replaceword/gc
- set number ,set relativenumber
- Set mouse=a
- **/pattern** – search forward for the specified pattern

Please Search

Working with Multiple Files

Macros

Diff

Macros

- `qa` – record macro **a**
- `q` – stop recording macro
- `@a` – run macro **a**
- `@@` – run last macro again

Working with Multiple Files

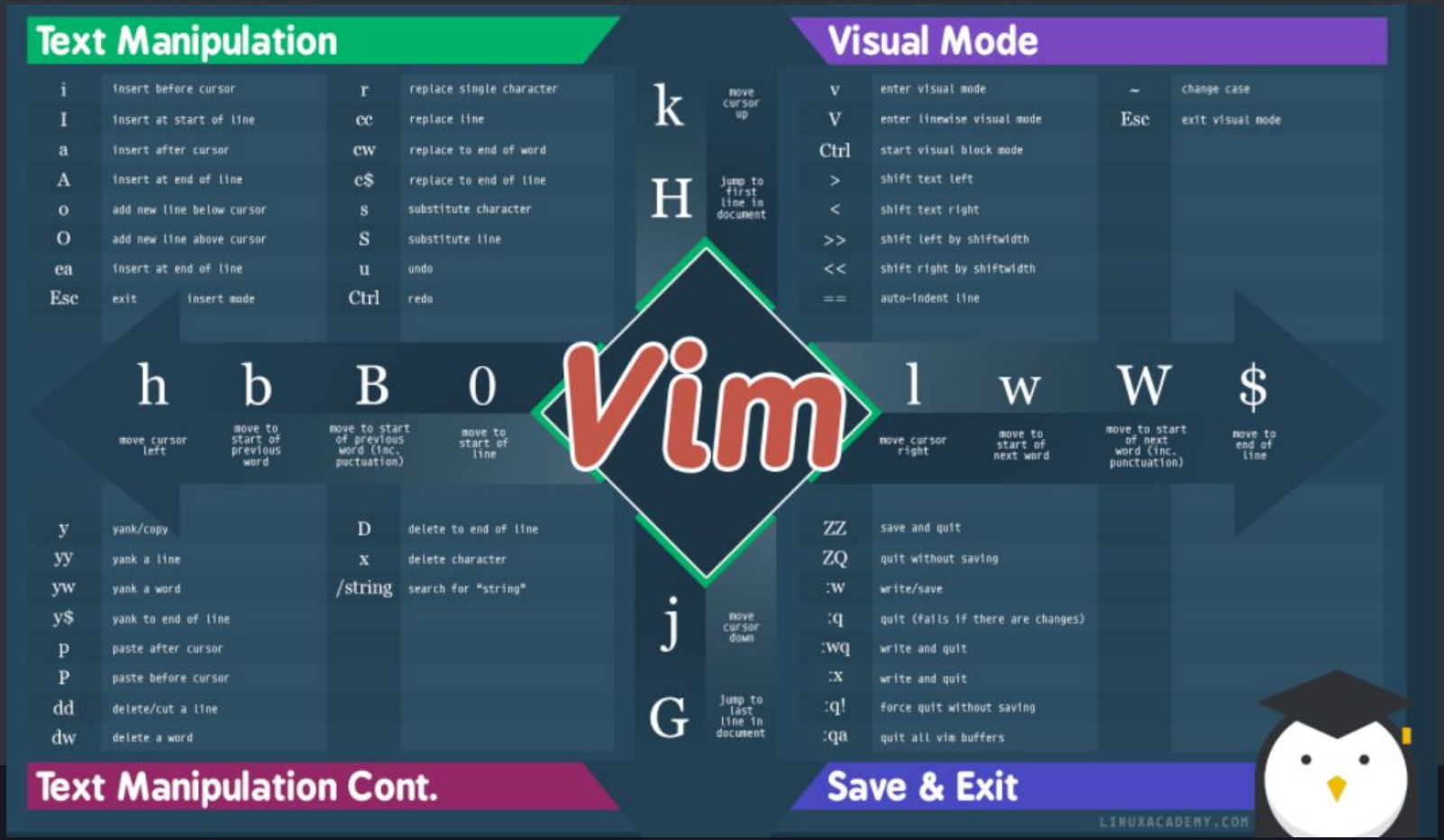
- `:e file_name` – open a file in a new buffer
- `:bn` – move to the next buffer
- `:bp` – go back to previous buffer
- `:bd` – close buffer
- `:b#` – move to the specified buffer (by number)
- `:b file_name` – move to a buffer (by name)
- `:ls` – list all open buffers

```
:ls
  1 #    "Example"                        line 1
  2      "file_name"                      line 1
  3 %a   "New_Buffer"                     line 1
Press ENTER or type command to continue
```

- `:sp file_name` – open a file in a new buffer and split viewport horizontally
- `:vs file_name` – open a file in a new buffer and split viewport vertically
- `:vert ba` – edit all files as vertical viewports
- `:tab ba` – edit all buffers as tabs
- `gt` – move to next tab
- `gT` – move to previous tab

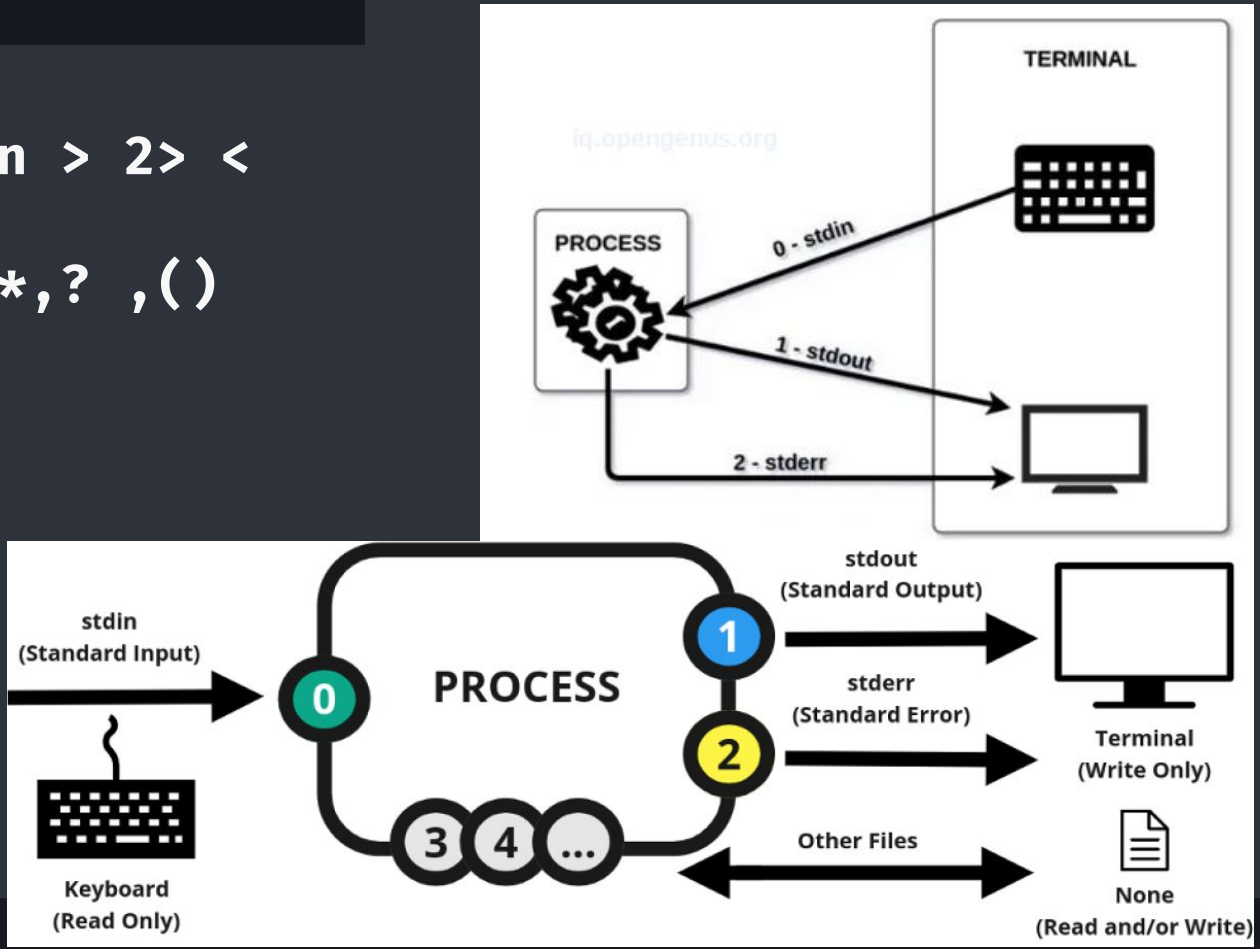
- `Ctrl+ws` – split viewport
- `Ctrl+wv` – split viewport vertically
- `Ctrl+ww` – switch viewports
- `Ctrl+wq` – quit a viewport
- `Ctrl+wx` – exchange current viewport with next one
- `Ctrl+=` – make all viewports equal in height and width

Try to use it with time



3-Controls

Redirection > 2> <
Piping |
Wild card *,? ,()



Redirection

Output

```
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ echo "Welcome Linux Group " > file.txt
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt
Welcome Linux Group
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ echo " New Line " >>file.txt
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt
Welcome Linux Group
 New Line
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$
```

Input

```
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat < file.txt
Welcome Linux Group
 New Line
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt
Welcome Linux Group
 New Line
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$
```

0 means Input

1 means Output

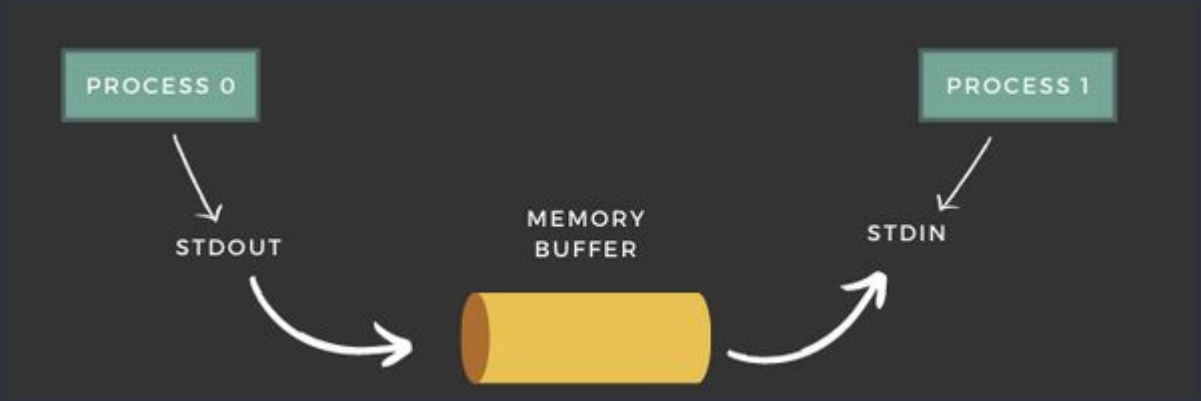
2 means Error

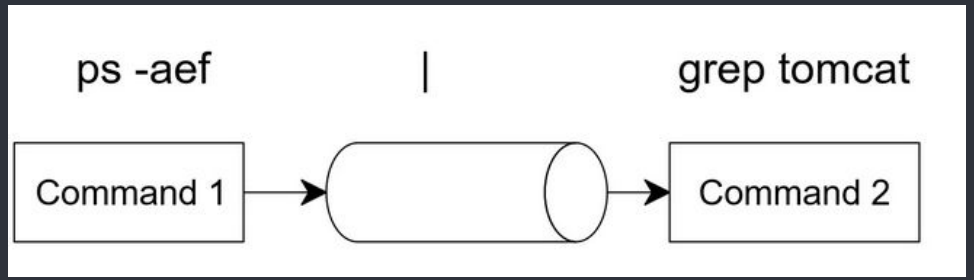
```
moatasem@moatasem-VirtualBox:~$ ls /dev/std* -l
lrwxrwxrwx 1 root root 15 20:22 27 نوف /dev/stderr -> /proc/self/fd/2
lrwxrwxrwx 1 root root 15 20:22 27 نوف /dev/stdin -> /proc/self/fd/0
lrwxrwxrwx 1 root root 15 20:22 27 نوف /dev/stdout -> /proc/self/fd/1
moatasem@moatasem-VirtualBox:~$
```

```
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ lgnaawonasd 2> Error_log.txt
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat Error_log.txt
lgnaawonasd: command not found
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$
```

```
oatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ agmlkdnhpqemgawmqwmg  2> /dev/null
oatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat /dev/null
oatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$
```

Piping


PROCESS 0
PROCESS 1
STDOUT
MEMORY
BUFFER
STDIN


ps -aef
|
grep tomcat
Command 1
Command 2

Wild Card

In Linux, a wildcard is a character or a sequence of characters used to represent one or more other characters. Wildcards are mainly used with commands like `ls`, `cp`, `mv`, and `find` to perform operations on multiple files or directories that match a certain pattern. Here are some common wildcards in Linux:

1. **Asterisk (*)** : The asterisk (*) represents zero or more characters. For example:
   - `*.txt` matches all files ending with ".txt".
   - `file*` matches all files starting with "file".
   - `*pattern*` matches all files or directories containing "pattern" anywhere in their names.
2. **Question Mark (?)**: The question mark (?) represents a single character. For example:
   - `file?.txt` matches "file1.txt", "fileA.txt", but not "file10.txt".
3. **Square Brackets [ ] and,ranges** : Square brackets allow you to specify a range or a set of characters for a single position in the pattern. For example:
   - `[0-9]*` matches all files or directories starting with a digit.
   - `[aeiou]` matches any single vowel.
4. **Brace Expansion {} or** : Brace expansion allows you to generate multiple strings by specifying a comma-separated list inside curly braces. For example:
   - `file{1,2,3}.txt` expands to "file1.txt", "file2.txt", "file3.txt".
   - `{apple,banana,orange}` expands to "apple", "banana", "orange".
5. **Exclamation Mark (!) not**: The exclamation mark (!) can be used to negate a pattern. For example:
   - `ls !(*.txt)` lists all files and directories that do not end with ".txt".

Regex

- Literal characters are those characters that represent themselves in the search pattern

  $ grep "error" *.log

  The letters in "error" are all literal characters

- Meta characters are those characters that have special meaning,

  **^ $. [ ] { } - ? * + ( ) | **

  All other characters are literal characters

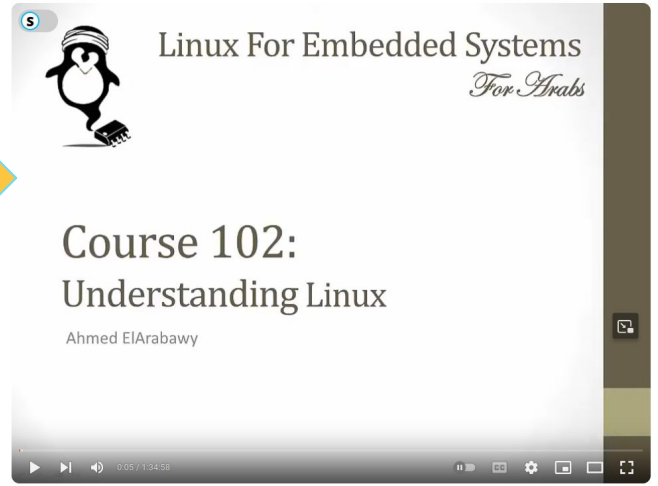
- Meta characters can be treated as literals if they are ***escaped***, i.e. preceded by a back slash
  - Examples, **\^ \{ \$ **
- The back slash can also convert some of the literal characters into a meta-characters
  - Examples : **\d \w**

- Basic Regular Expressions use the following meta-characters, all other characters are considered litteral:

  . ^ $ [ ] *

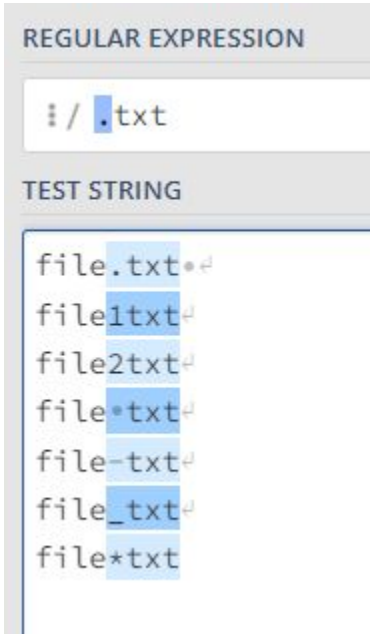
- Extended Regular Expressions use the following set in addition to the basic set,

  ( ) { } ? + |



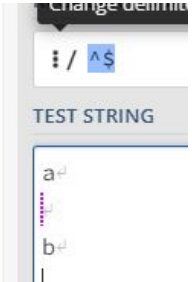
Course 102: Lecture 13: Regular Expressions

Any Character (.)

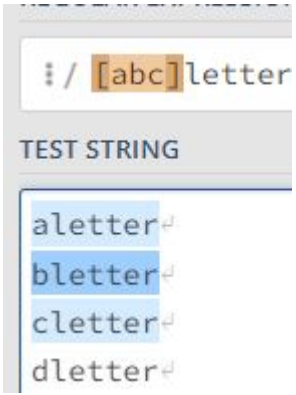


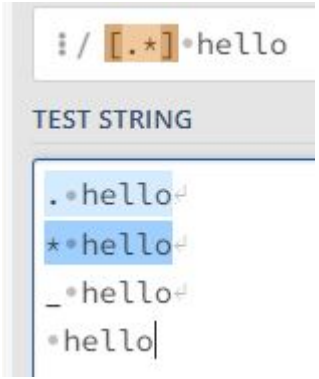
At the beginning (^)

At the end ($)

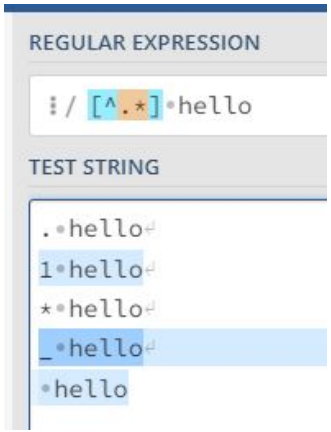


Any value from group [ ]

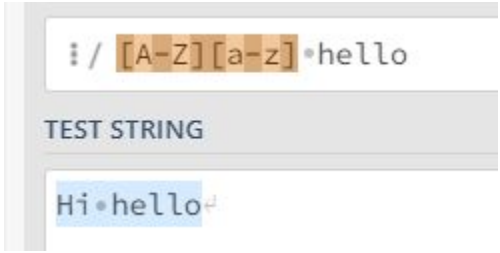


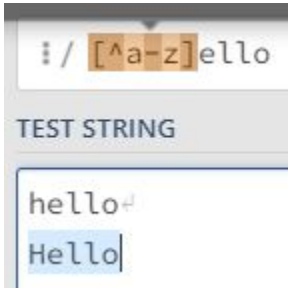


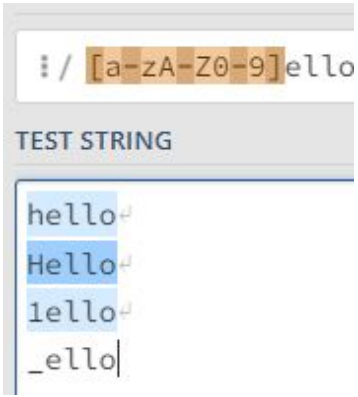
Any value not from group [^]



range [-]



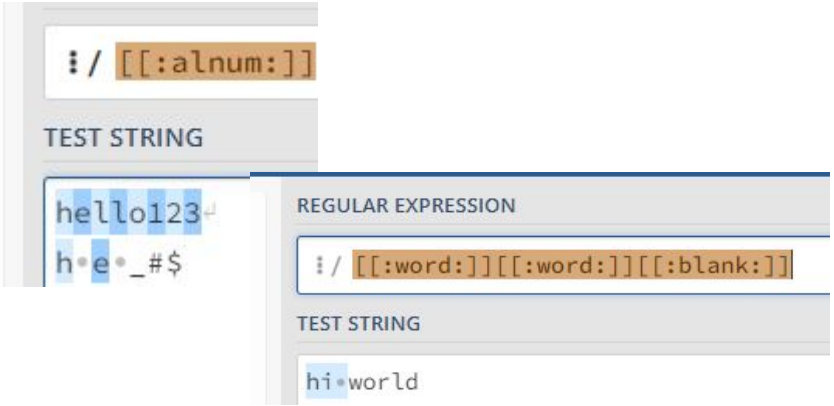




Shorthand character class

regex	Description
\w	Stands for [a-zA-Z0-9_] (word character)
\s	Stands for space characters or tabs or line breaks
\t	Stands for tabs(ASCII 0x09)
\r	Stands for Carriage Return (ASCII 0x0D)
\n	Stands for Line Feed (0x0A)
\xnn	Stands for character with ASCII = nn (\xA9 == @)

character class



The following character classes can be used,

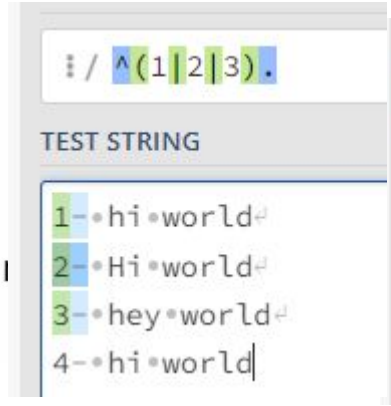
Class	Description
[[:alnum:]]	Alphanumeric [a-zA-Z0-9]
[[:word:]]	same as alnum with addition of underscore (\w) [a-zA-Z0-9_]
[[:alpha:]]	Only letters [a-zA-Z]
[[:digit:]]	Only Digits [0-9]
[[:blank:]]	Space Bar or Tab (\s)
[[:lower:]]	Only lower case letters [a-z]
[[:upper:]]	Only upper case letters [A-Z]
[[:space:]]	space
[[:xdigit:]]	Hex digit [a-fA-F0-9]

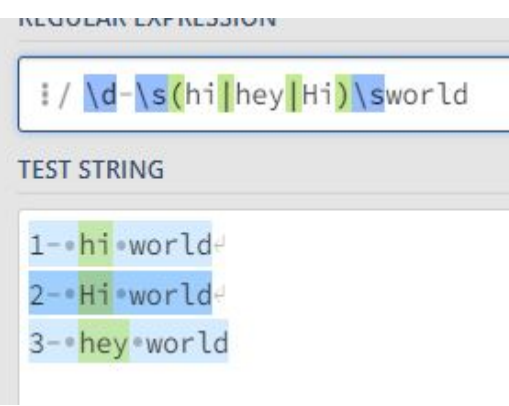
OR |

$ grep -E "AAA|BBB" file.txt

This matches any line containing AAA or BBB

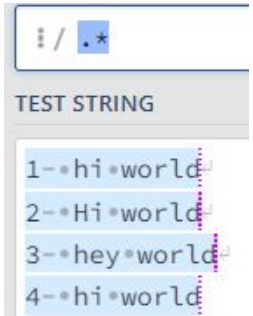
We separate the alternation from the rest of the regular expression using '**()**'

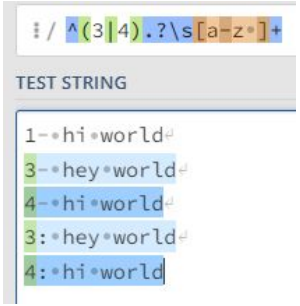




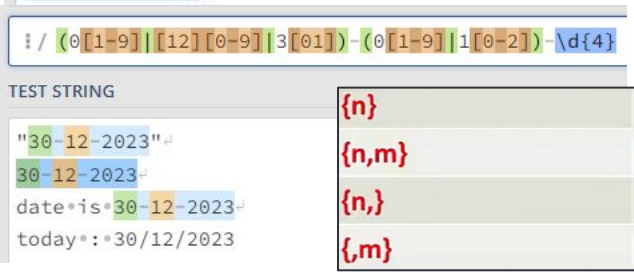
Quantifiers (*,+, and ?)

- The character '**?**' is used to express that the preceding element to be optional (zero or one time)
- The character '*****' is used (zero or More times)
- The character '**+**' is used (One or More times)





Matching Count ({) and (})



{n}	n times
{n,m}	n to m times (inclusive)
{n,}	n or more times
{,m}	m or less times

Task

1- use regex with grep to validate email and phone number

2- use regex with python to validate address 22,st salah salem-Giza

3- use regex with C++ to validate branch name
feature/TN-123/branchname

4- (future task) use regex with rust to validate email and phone number

```
exit@MoatasemP1:~/test$ ls file[1-6].txt
file1.txt  file2.txt  file3.txt  file4.txt  file5.txt  file6.txt
exit@MoatasemP1:~/test$
```

```
exit@MoatasemP1:~/test$ ls file?.txt
file1.txt  file2.txt  file3.txt  file4.txt  file5.txt  file6.txt  file7.txt  file8.txt  file9.txt
exit@MoatasemP1:~/test$ ls file??.txt
file10.txt  file19.txt  file28.txt  file37.txt  file46.txt  file55.txt  file64.txt  file73.txt  file82.txt  file91.txt
file11.txt  file20.txt  file29.txt  file38.txt  file47.txt  file56.txt  file65.txt  file74.txt  file83.txt  file92.txt
file12.txt  file21.txt  file30.txt  file39.txt  file48.txt  file57.txt  file66.txt  file75.txt  file84.txt  file93.txt
file13.txt  file22.txt  file31.txt  file40.txt  file49.txt  file58.txt  file67.txt  file76.txt  file85.txt  file94.txt
file14.txt  file23.txt  file32.txt  file41.txt  file50.txt  file59.txt  file68.txt  file77.txt  file86.txt  file95.txt
file15.txt  file24.txt  file33.txt  file42.txt  file51.txt  file60.txt  file69.txt  file78.txt  file87.txt  file96.txt
file16.txt  file25.txt  file34.txt  file43.txt  file52.txt  file61.txt  file70.txt  file79.txt  file88.txt  file97.txt
file17.txt  file26.txt  file35.txt  file44.txt  file53.txt  file62.txt  file71.txt  file80.txt  file89.txt  file98.txt
file18.txt  file27.txt  file36.txt  file45.txt  file54.txt  file63.txt  file72.txt  file81.txt  file90.txt  file99.txt
exit@MoatasemP1:~/test$
```

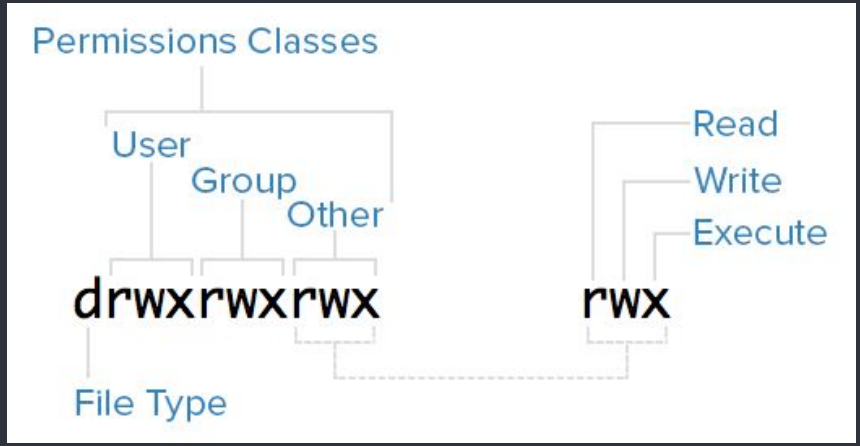
```
aaronkilik@tecmint ~/users-info $ ls
users-111.list  users-1AA.list  users-22A.list  users-2aB.txt   users-2ba.txt
users-111.txt   users-1AA.txt   users-22A.txt   users-2AB.txt   users-2bA.txt
users-11A.txt   users-1AB.list  users-2aA.txt   users-2ba.list
users-12A.txt   users-1AB.txt   users-2AB.list  users-2bA.list
aaronkilik@tecmint ~/users-info $
aaronkilik@tecmint ~/users-info $ ls users-[0-9][a-z0-9][0-9]*
users-111.list  users-111.txt
aaronkilik@tecmint ~/users-info $
aaronkilik@tecmint ~/users-info $ ls users-[0-9][a-zA-Z0-9][0-9]*
users-111.list  users-111.txt
aaronkilik@tecmint ~/users-info $ ls users-[0-9][a-zA-Z0-9][a-zA-Z]*
users-11A.txt   users-1AB.list  users-2aA.txt   users-2ba.list
users-12A.txt   users-1AB.txt   users-2AB.list  users-2bA.list
users-1AA.list  users-22A.list  users-2aB.txt   users-2ba.txt
users-1AA.txt   users-22A.txt   users-2AB.txt   users-2bA.txt
```

1- (*) zero to more
2-[a-z] range from a to z
3-[abcdef] group of characters
4-[a-zA-Z] two groups
5-? Single character
6- {1..10} from 1 to 10 as loop
7- {*.txt,*.doc} or

4-File Permissions

Chmod
chown

```
moatasem@moatasem-VirtualBox:~/Desktop$ ls -al
total 20
drwxr-xr-x  4 moatasem moatasem 4096 12:47 29 س .
drwxr-xr-x 26 moatasem moatasem 4096 22:54 25 س ..
drwxrwxr-x  6 moatasem moatasem 4096 22:34 28 ف Embedded_Linux
-rwxrw-r--  1 moatasem moatasem   15 22:22 25 س hello.py
drwxrwxr-x  2 moatasem moatasem 4096 12:47 29 س ledproject
moatasem@moatasem-VirtualBox:~/Desktop$
```



chmod

```
chmod u=rw,og=r new_file.txt
```

```
dave@howtogeek:~/work$ chmod u=rw,go=r new_file.txt
```

We could have achieved the same thing without the “a” in the “a+x” statement. The following command would have worked just as well.

```
chmod +x new_script.sh
```

```
chmod o-r *.page
```

```
dave@howtogeek:~/work$ chmod o-r *.page
```

- 0: (000) No permission.
- 1: (001) Execute permission.
- 2: (010) Write permission.
- 3: (011) Write and execute permissions.
- 4: (100) Read permission.
- 5: (101) Read and execute permissions.
- 6: (110) Read and write permissions.
- 7: (111) Read, write, and execute permissions.

```
chmod 664 *.page
```

```
dave@howtogeek:~/work$ chmod 664 *.page
```

This sets the permissions we require for the user, group members, and others to what we require. The users and group members have their permissions reset to what they already were, and the others have the read permission restored.

```
ls -l
```

```
dave@howtogeek:~/work$ ls -l
total 108
drwxr-xr-x 2 dave dave  4096 Aug 23 08:02 archive
-rw-rw-r-- 1 dave dave   780 Aug 20 11:11 command_cls.page
-rw-rw-r-- 1 dave dave   828 Aug 20 11:11 command_exit.page
-rw-rw-r-- 1 dave dave   819 Aug 20 11:11 command_gc.page
-rw-rw-r-- 1 dave dave   799 Aug 20 11:11 command_osm.page
-rw-rw-r-- 1 dave dave   829 Aug 20 11:11 command_quit.page
-rw-rw-r-- 1 dave dave   832 Aug 20 11:11 command_satellite.page
-rw-rw-r-- 1 dave dave   811 Aug 20 11:11 command_street.page
-rwxrwxr-x 1 dave dave    46 Aug 20 11:11 mh.sh
-rw-r--r-- 1 dave dave 28127 Aug 20 11:11 new_file.txt
-rwxr-xr-x 1 dave dave 28127 Aug 24 07:20 new_script.sh
-rw-rw-r-- 1 dave dave 16149 Aug 20 11:11 window_tool.page
dave@howtogeek:~/work$
```

chown

```
moatasem@moatasem-VirtualBox:~/Desktop$ man chown
moatasem@moatasem-VirtualBox:~/Desktop$ man chown
moatasem@moatasem-VirtualBox:~/Desktop$ ls -al
total 20
drwxr-xr-x  4 moatasem moatasem 4096 12:47 29 س .
drwxr-xr-x 26 moatasem moatasem 4096 22:54 25 س ..
drwxrwxr-x  6 moatasem moatasem 4096 22:34 28 ف Embedded_Linux
-rwxrw-r--  1 moatasem moatasem   15 22:22 25 س hello.py
drwxrwxr-x  2 moatasem moatasem 4096 12:47 29 س ledproject
moatasem@moatasem-VirtualBox:~/Desktop$ sudo chown root:moatasemgr hello.py
moatasem@moatasem-VirtualBox:~/Desktop$ ls -al
total 20
drwxr-xr-x  4 moatasem moatasem   4096 12:47 29 س .
drwxr-xr-x 26 moatasem moatasem   4096 22:54 25 س ..
drwxrwxr-x  6 moatasem moatasem   4096 22:34 28 ف Embedded_Linux
-rwxrw-r--  1 root     moatasemgr   15 22:22 25 س hello.py
drwxrwxr-x  2 moatasem moatasem   4096 12:47 29 س ledproject
moatasem@moatasem-VirtualBox:~/Desktop$
```

5-File Compression and Archiving

1. Tar
2. Bz2
3. 7z
   Gz
4.
5. Task : check underline
6.
7.
8.
9.
10.
11.
12.
13.
14.

```
extract ()
{
    if [ -f "$1" ]; then
        case "$1" in
            *.tar.bz2)
                tar xvjf "$1"
            ;;
            *.tar.gz)
                tar xvzf "$1"
            ;;
            *.tar.xz)
                tar Jxvf "$1"
            ;;
            *.bz2)
                bunzip2 "$1"
            ;;
            *.rar)
                rar x "$1"
            ;;
            *.gz)
                gunzip "$1"
            ;;
            *.tar)
                tar xvf "$1"
            ;;
            *.tbz2)
                tar xvjf "$1"
            ;;
            *.tgz)
                *tar xvzf "$1"
            ;;
            *.zip)
                unzip -d $(echo "$1" | sed 's/\(.*\)\.zip/\1/') "$1"
            ;;
            *.Z)
                uncompress "$1"
            ;;
            *.7z)
                7z x "$1"
            ;;
            *)
                echo "don't know how to extract '"$1"'"
            ;;
        esac;
    else
        echo " not a valid file!";
    fi
}
```

TAR

- E[x]tract a (compressed) archive [f]ile into the current directory [v]erbosely:
  tar xvf path/to/source.tar[.gz|.bz2|.xz]

To extract the contents of the tar.gz file to the current directory, type

```
tar -zxvf file_name.tar.gz
```

NOTE: You can specify a different directory to extract to using the **-C** parameter and path to the directory as follows:

```
tar -C /myfolder -zxvf file_name.tar.gz
```

```
tar -xvf file_name.tar
```

Or to extract to another directory, type

```
tar -C /myfolder -xvf file_name.tar
```

- Lis[t] the contents of a tar [f]ile [v]erbosely:
  tar tvf path/to/source.tar

-a, --auto-compress use archive suffix to determine the compression

```
tar -czvf archive.tar.gz /home/ubuntu --exclude=*.mp4
```

```
ubuntu@ubuntu: ~
ubuntu@ubuntu:~$ tar -czvf archive.tar.gz /home/ubuntu --exclude=/home/u
untu/Downloads --exclude=/home/ubuntu/.cache
tar: Removing leading `/' from member names
/home/ubuntu/
/home/ubuntu/archive.tar.gz
/home/ubuntu/stuff/
/home/ubuntu/stuff/test/
/home/ubuntu/stuff/test/file2
/home/ubuntu/stuff/test/file1
/home/ubuntu/.ICEauthority
/home/ubuntu/Videos/
/home/ubuntu/Pictures/
/home/ubuntu/Music/
/home/ubuntu/Documents/
/home/ubuntu/Documents/notes.txt
```

- [c]reate an archive and write it to a [f]ile:
  tar cf path/to/target.tar path/to/file1 path/to/file2 ...

- [c]reate a g[z]ipped archive and write it to a [f]ile:
  tar czf path/to/target.tar.gz path/to/file1 path/to/file2 ...

6-Text Processing

grep

Options Description

-c : This prints only a count of the lines that match a pattern
-h : Display the matched lines, but do not display the filenames.
-i : Ignores, case for matching
-l : Displays list of a filenames only.
-n : Display the matched lines and their line numbers.
-v : This prints out all the lines that do not matches the pattern
-e exp : Specifies expression with this option. Can use multiple times.
-f file : Takes patterns from file, one per line.
-E : Treats pattern as an extended regular expression (ERE)
-w : Match whole word
-o : Print only the matched parts of a matching line,
with each such part on a separate output line.

-A n : Prints searched line and nlines after the result.
-B n : Prints searched line and n line before the result.
-C n : Prints searched line and n lines after before the result.

```
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt
Welcome Linux Group
 New Line
moatasem
thank you
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt  | grep moatasem
moatasem
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt  | grep -c moatasem
1
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt  | grep -v moatasem
Welcome Linux Group
 New Line
thank you
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt  | grep -i MOATASEM
moatasem
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt  | grep -ni MOATASEM
3:moatasem
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt  | grep -ni MOATASEM^C
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ grep -r moatasem .
./file.txt:moatasem
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$
```

```
./file.txt:moatasem
./folder/display.txt:moatasem
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$
```

Sed

By default, the sed command replaces the first occurrence of the pattern in each line and it won't replace the second, third...occurrence in the line.

```
$sed 's/unix/linux/' geekfile.txt
```

Output :

```
linux is great os. unix is opensource. unix is free os.
learn operating system.
linux linux which one you choose.
linux is easy to learn.unix is a multiuser os.Learn unix .unix is a p
```

Here the "s" specifies the substitution operation. The "/" are delimiters. The "unix" is the search pattern and the "linux" is the replacement string.

By default, the sed command replaces the first occurrence of the pattern in each line and it won't replace the second, third...occurrence in the line.

Replacing all the occurrence of the pattern in a line : The substitute flag /g (glo replacement) specifies the sed command to replace all the occurrences of the string in the line.

```
$sed 's/unix/linux/g' geekfile.txt
```

Output :

```
linux is great os. linux is opensource. linux is free os.
learn operating system.
linux linux which one you choose.
linux is easy to learn.linux is a multiuser os.Learn linux .linux
```

Replacing from nth occurrence to all occurrences in a line : Use the combination of /1, /2 etc and /g to replace all the patterns from the nth occurrence of a pattern in a line. The following sed command replaces the third, fourth, fifth... "unix" word with "linux" word in a line.

```
$sed 's/unix/linux/3g' geekfile.txt
```

Output:

```
unix is great os. unix is opensource. linux is free os.
learn operating system.
unix linux which one you choose.
unix is easy to learn.unix is a multiuser os.Learn linux .linux is a
```

Replacing string on a range of lines : You can specify a range of line numbers to the sed command for replacing a string.

```
$sed '1,3 s/unix/linux/' geekfile.txt
```

Output:

```
linux is great os. unix is opensource. unix is free os.
learn operating system.
linux linux which one you choose.
unix is easy to learn.unix is a multiuser os.Learn unix .unix is a po
```

sed

1. Basic Text Replacement:

- Use sed to replace all occurrences of "old" with "new" in a text file.

```
sed 's/old/new/g' input.txt > output.txt
```

2. In-Place Editing:

- Edit a file in-place using sed (creates a backup with the .bak extension):

```
sed -i.bak 's/old/new/g' file.txt
```

3. Printing Lines:

- Print all lines containing the word "pattern":

```
sed -n '/pattern/p' file.txt
```

4. Deleting Lines:

- Delete all lines containing the word "pattern":

```
sed '/pattern/d' file.txt
```

5. Inserting Text:

- Insert a line of text before a specific pattern:

```
sed '/pattern/i\This is a new line' file.txt
```

6. Appending Text:

- Append a line of text after a specific pattern:

```
sed '/pattern/a\This line comes after the pattern' file.txt
```

7. Using Regular Expressions:

- Use a regular expression to match and replace complex patterns:

```
sed 's/[0-9][0-9][0-9]-[0-9][0-9][0-9]/REPLACEMENT/g' file.txt
```

```
$ sed -r -n  '/^[a-z]{5}/p' file
```

Search: **Range of Lines, Using sed Scripts,Multiple sed Commands**

Task

Check awk command

- how to print specific column in file separated with spaces
- how to print specific column in file separated with comma
- awk '/Moatasem/ {print $2}' file → what this command will do ?
- awk '$1 ~ /(Moatasem|this)/' file→ what this command will do ?

cut

```
exit@MoatasemP1:~$ cat file.txt
ahmed mohamed mostafa
ali gamal farouk
mostafa hassan amr
hossam ashraf eldin
nour adel ahmed
salah shady fouaad

exit@MoatasemP1:~$ cut file.txt -b 1,2,3,4,5
ahmed
ali g
mosta
hossa
nour
salah

exit@MoatasemP1:~$
```

```
exit@MoatasemP1:~$
exit@MoatasemP1:~$ cat file.txt
ahmed mohamed mostafa
ali gamal farouk
mostafa hassan amr
hossam ashraf eldin
nour adel ahmed
salah shady fouaad

exit@MoatasemP1:~$ cut file.txt -d " " -f 1
ahmed
ali
mostafa
hossam
nour
salah

exit@MoatasemP1:~$ cut file.txt -d " " -f 2
mohamed
gamal
hassan
ashraf
adel
shady

exit@MoatasemP1:~$ cut file.txt -d " " -f 3
mostafa
```

hexdump

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$ hexdump  --help

Usage:
 hexdump [options] <file>...

Display file contents in hexadecimal, decimal, octal, or ascii.

Options:
 -b, --one-byte-octal      one-byte octal display
 -c, --one-byte-char       one-byte character display
 -C, --canonical           canonical hex+ASCII display
 -d, --two-bytes-decimal   two-byte decimal display
 -o, --two-bytes-octal     two-byte octal display
 -x, --two-bytes-hex       two-byte hexadecimal display
 -L, --color[=<mode>]      interpret color formatting specifiers
                             colors are enabled by default
 -e, --format <format>     format string to be used for displaying data
 -f, --format-file <file>  file that contains format strings
 -n, --length <length>     interpret only length bytes of input
 -s, --skip <offset>       skip offset bytes from the beginning
 -v, --no-squeezing        output identical lines

 -h, --help                display this help
 -V, --version             display version

Arguments:
 <length> and <offset> arguments may be followed by the suffixes for
   GiB, TiB, PiB, EiB, ZiB, and YiB (the "iB" is optional)

For more details see hexdump(1).
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$ hexdump -C ../../../02_C++/02_Derived/a.out | head
00000000  7f 45 4c 46 02 01 01 00  00 00 00 00 00 00 00 00  |.ELF............|
00000010  03 00 3e 00 01 00 00 00  e0 10 00 00 00 00 00 00  |..>.............|
00000020  40 00 00 00 00 00 00 00  98 78 00 00 00 00 00 00  |@........x......|
00000030  00 00 00 00 40 00 38 00  0d 00 40 00 25 00 24 00  |....@.8...@.%.$.|
00000040  06 00 00 00 04 00 00 00  40 00 00 00 00 00 00 00  |........@.......|
00000050  40 00 00 00 00 00 00 00  40 00 00 00 00 00 00 00  |@.......@.......|
00000060  d8 02 00 00 00 00 00 00  d8 02 00 00 00 00 00 00  |................|
00000070  08 00 00 00 00 00 00 00  03 00 00 00 04 00 00 00  |................|
00000080  18 03 00 00 00 00 00 00  18 03 00 00 00 00 00 00  |................|
00000090  18 03 00 00 00 00 00 00  1c 00 00 00 00 00 00 00  |................|
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$
```

file

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$ file ../../../02_C++/02_Derived/a.out
../../../02_C++/02_Derived/a.out: ELF 64-bit LSB pie executable, x86-64, version 1 (SYSV), dynamically linked, interpreter /lib64/ld-linux-x86-64.so.2, BuildID[sha1]=dbb6c17ba7318fac3aea0658a2f5ecc078b8a906, for GNU/Linux 3.2.0, with debug_info, not stripped
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$
```

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$ file ~/main.cpp
/home/moatsem/main.cpp: C source, ASCII text
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$ file file.bak
file.bak: ASCII text
```

7-System Information

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$ uname -a
Linux moatsem-IdeaPad-Gaming-3-15IAH7 6.2.0-31-generic #31~22.04.1-Ubuntu SMP PREEMPT_DYNAMIC Wed Aug 16 13:45:26 UTC 2 x86_64 x86_64 x86_64 GNU/Linux
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$ uname --help
Usage: uname [OPTION]...
Print certain system information.  With no OPTION, same as -s.

  -a, --all                print all information, in the following order,
                             except omit -p and -i if unknown:
  -s, --kernel-name        print the kernel name
  -n, --nodename           print the network node hostname
  -r, --kernel-release     print the kernel release
  -v, --kernel-version     print the kernel version
  -m, --machine            print the machine hardware name
  -p, --processor          print the processor type (non-portable)
  -i, --hardware-platform  print the hardware platform (non-portable)
  -o, --operating-system   print the operating system
      --help     display this help and exit
      --version  output version information and exit

GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
Full documentation <https://www.gnu.org/software/coreutils/uname>
or available locally via: info '(coreutils) uname invocation'
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$
```

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$ free -h
               total        used        free      shared  buff/cache   available
Mem:            15Gi       7.4Gi       719Mi       1.9Gi       7.2Gi       5.6Gi
Swap:          8.0Gi       142Mi       7.9Gi
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs           1.6G  4.5M  1.6G   1% /run
/dev/nvme0n1p2  468G  239G  206G  54% /
tmpfs           7.7G   70M  7.7G   1% /dev/shm
tmpfs           5.0M  4.0K  5.0M   1% /run/lock
tmpfs           7.7G     0  7.7G   0% /run/qemu
/dev/nvme0n1p1  511M   15M  497M   3% /boot/efi
tmpfs           1.6G  188K  1.6G   1% /run/user/1000
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$
```

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$ uptime
 22:24:04 up  5:10,  1 user,  load average: 0.89, 0.88, 0.99
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$
```

Ls family

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$ lscpu
Architecture:            x86_64
  CPU op-mode(s):        32-bit, 64-bit
  Address sizes:         39 bits physical, 48 bits virtua
  Byte Order:            Little Endian
CPU(s):                  16
  On-line CPU(s) list:   0-15
Vendor ID:               GenuineIntel
  Model name:            12th Gen Intel(R) Core(TM) i7-12
    CPU family:          6
    Model:               154
    Thread(s) per core:  2
    Core(s) per socket:  10
    Socket(s):           1
    Stepping:            3
    CPU max MHz:         4700.0000
    CPU min MHz:         400.0000
    BogoMIPS:            5376.00
    Flags:               fpu vme de pse tsc msr pae mce c
                         tsc art arch_perfmon pebs bts re
                         ha fma cx16 xtpr pdcm sse4_1 sse
```

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$ lsusb
Bus 004 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 003 Device 003: ID 048d:c976 Integrated Technology Express, Inc. ITE Device(8176)
Bus 003 Device 002: ID 5986:212b Acer, Inc Integrated Camera
Bus 003 Device 008: ID 258a:002a SINO WEALTH Gaming KB
Bus 003 Device 018: ID 1d5c:7102 Fresco Logic Generic Billboard Device
Bus 003 Device 017: ID 1a81:2232 Holtek Semiconductor, Inc. Lenovo Gaming Mouse
Bus 003 Device 016: ID 05e3:0610 Genesys Logic, Inc. Hub
Bus 003 Device 004: ID 0bda:4853 Realtek Semiconductor Corp. Bluetooth Radio
Bus 003 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 002 Device 009: ID 05e3:0749 Genesys Logic, Inc. SD Card Reader and Writer
Bus 002 Device 008: ID 05e3:0626 Genesys Logic, Inc. USB3.1 Hub
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$
```

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$ lspci
0000:00:00.0 Host bridge: Intel Corporation Device 4649 (rev 02)
0000:00:01.0 PCI bridge: Intel Corporation 12th Gen Core Processor
0000:00:02.0 VGA compatible controller: Intel Corporation Alder La
0000:00:04.0 Signal processing controller: Intel Corporation Alder
0000:00:06.0 PCI bridge: Intel Corporation 12th Gen Core Processor
0000:00:07.0 PCI bridge: Intel Corporation Alder Lake-P Thunderbol
0000:00:08.0 System peripheral: Intel Corporation 12th Gen Core Pr
0000:00:0d.0 USB controller: Intel Corporation Alder Lake-P Thunde
0000:00:0d.2 USB controller: Intel Corporation Alder Lake-P Thunde
0000:00:0e.0 RAID bus controller: Intel Corporation Volume Managem
```

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$ lsblk
NAME        MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
loop0         7:0    0     4K  1 loop /snap/bare/5
loop1         7:1    0  14.6M  1 loop /snap/cheat/4053
loop2         7:2    0 118.2M  1 loop /snap/core/15511
loop3         7:3    0 105.8M  1 loop /snap/core/15925
loop4         7:4    0  55.7M  1 loop /snap/core18/2785
loop5         7:5    0  55.7M  1 loop /snap/core18/2790
loop6         7:6    0  63.4M  1 loop /snap/core20/1974
loop7         7:7    0  63.5M  1 loop /snap/core20/2015
loop8         7:8    0  73.9M  1 loop /snap/core22/858
loop9         7:9    0  73.9M  1 loop /snap/core22/864
loop11        7:11   0 237.2M  1 loop /snap/firefox/2987
loop12        7:12   0 164.8M  1 loop /snap/gnome-3-28-1804/194
loop13        7:13   0 164.8M  1 loop /snap/gnome-3-28-1804/198
loop14        7:14   0 349.7M  1 loop /snap/gnome-3-38-2004/140
loop15        7:15   0 349.7M  1 loop /snap/gnome-3-38-2004/143
loop16        7:16   0 485.5M  1 loop /snap/gnome-42-2204/120
loop17        7:17   0 485.5M  1 loop /snap/gnome-42-2204/126
loop18        7:18   0  91.7M  1 loop /snap/gtk-common-themes/1535
loop19        7:19   0  76.2M  1 loop /snap/mqttx/40
loop20        7:20   0  76.3M  1 loop /snap/mqttx/41
loop21        7:21   0  45.9M  1 loop /snap/snap-store/638
loop22        7:22   0  12.3M  1 loop /snap/snap-store/959
loop23        7:23   0  40.8M  1 loop /snap/snapd/19993
loop24        7:24   0  40.8M  1 loop /snap/snapd/20092
loop25        7:25   0   428K  1 loop /snap/snapd-desktop-integration/57
loop26        7:26   0   452K  1 loop /snap/snapd-desktop-integration/83
loop27        7:27   0  87.2M  1 loop /snap/sqlitebrowser/3233
loop28        7:28   0  79.6M  1 loop /snap/teams-for-linux/436
loop29        7:29   0  79.6M  1 loop /snap/teams-for-linux/441
loop30        7:30   0 187.3M  1 loop /snap/vidcutter/77
loop31        7:31   0 236.8M  1 loop /snap/firefox/3068
sda           8:0    1     0B  0 disk
sdb           8:16   1     0B  0 disk
nvme0n1     259:0    0 476.9G  0 disk
├─nvme0n1p1 259:1    0   512M  0 part /boot/efi
└─nvme0n1p2 259:2    0 476.4G  0 part /var/snap/firefox/common/host-hunspell
                                      /
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$
```

- Display drivers and modules handling each device:
  `lspci -k`

du

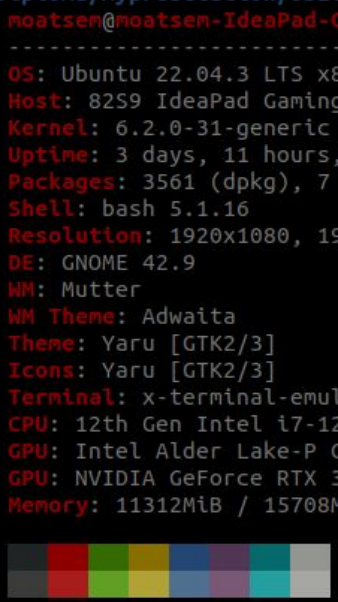
```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux$ du -sh
15M     .
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux$ du -h -d 1
4.8M    ./02_shell
16K     ./03_commands
6.3M    ./01_introduction
3.4M    ./Session 3
15M     .
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux$ du -h -d 2
136K    ./02_shell/create_shell
4.8M    ./02_shell
12K     ./03_commands/sed
16K     ./03_commands
6.3M    ./01_introduction
3.4M    ./Session 3
15M     .
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux$
```

/proc,/etc

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux$ cat /etc/hostname
moatsem-IdeaPad-Gaming-3-15IAH7
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux$ cat /etc/lsb-release
DISTRIB_ID=Ubuntu
DISTRIB_RELEASE=22.04
DISTRIB_CODENAME=jammy
DISTRIB_DESCRIPTION="Ubuntu 22.04.3 LTS"
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux$ cat /etc/os-release
PRETTY_NAME="Ubuntu 22.04.3 LTS"
NAME="Ubuntu"
VERSION_ID="22.04"
VERSION="22.04.3 LTS (Jammy Jellyfish)"
VERSION_CODENAME=jammy
ID=ubuntu
ID_LIKE=debian
HOME_URL="https://www.ubuntu.com/"
SUPPORT_URL="https://help.ubuntu.com/"
BUG_REPORT_URL="https://bugs.launchpad.net/ubuntu/"
PRIVACY_POLICY_URL="https://www.ubuntu.com/legal/terms-and-policies/privacy-policy"
UBUNTU_CODENAME=jammy
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux$ cat /proc/meminfo
MemTotal:       16085488 kB
MemFree:          790724 kB
MemAvailable:    5881368 kB
Buffers:          722992 kB
Cached:          5799584 kB
```

who/neofetch/id

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$ whoami
moatsem
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$ who
moatsem  :1           2023-09-08 05:33 (:1)
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$ users
moatsem
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$ neofetch
```




```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$
```

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$ id
uid=1000(moatsem) gid=1000(moatsem) groups=1000(moatsem),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),122(lpadmin),135(lxd),136(sambashare),999(docker)
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$
```

8-System Monitoring and Logging

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux$ doas dmesg  | tail
[298115.211962] usb 3-5: New USB device found, idVendor=258a, idProduct=002a, bcdDevice=90.36
[298115.211972] usb 3-5: New USB device strings: Mfr=1, Product=2, SerialNumber=0
[298115.211976] usb 3-5: Product: Gaming KB
[298115.211979] usb 3-5: Manufacturer: SINO WEALTH
[298115.216179] input: SINO WEALTH Gaming KB  as /devices/pci0000:00/0000:00:14.0/usb3/3-5/3-5:1.0/0003:258A:002A.000B/input/input43
[298115.277212] hid-generic 0003:258A:002A.000B: input,hidraw3: USB HID v1.11 Keyboard [SINO WEALTH Gaming KB ] on usb-0000:00:14.0-5/input0
[298115.280744] input: SINO WEALTH Gaming KB  System Control as /devices/pci0000:00/0000:00:14.0/usb3/3-5/3-5:1.1/0003:258A:002A.000C/input/input44
[298115.340935] input: SINO WEALTH Gaming KB  Consumer Control as /devices/pci0000:00/0000:00:14.0/usb3/3-5/3-5:1.1/0003:258A:002A.000C/input/input45
[298115.341152] input: SINO WEALTH Gaming KB  Keyboard as /devices/pci0000:00/0000:00:14.0/usb3/3-5/3-5:1.1/0003:258A:002A.000C/input/input46
[298115.341511] hid-generic 0003:258A:002A.000C: input,hiddev1,hidraw4: USB HID v1.11 Keyboard [SINO WEALTH Gaming KB ] on usb-0000:00:14.0-5/input1
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux$ journalctl -f
Sep 11 16:25:01 moatsem-IdeaPad-Gaming-3-15IAH7 CRON[551346]: pam_unix(cron:session): session opened for user root(uid=0) by (uid=0)
Sep 11 16:25:01 moatsem-IdeaPad-Gaming-3-15IAH7 CRON[551347]: (root) CMD (command -v debian-sa1 > /dev/null && debian-sa1 1 1)
Sep 11 16:25:01 moatsem-IdeaPad-Gaming-3-15IAH7 CRON[551346]: pam_unix(cron:session): session closed for user root
```

```
- Show kernel messages:
  dmesg

- Show kernel error messages:
  dmesg --level err

- Show kernel messages and keep reading new ones, similar to `tail -f` (available in kernels 3.5.0 and newer):
  dmesg -w

- Show how much physical memory is available on this system:
  dmesg | grep -i memory

- Show kernel messages 1 page at a time:
  dmesg | less

- Show kernel messages with a timestamp (available in kernels 3.5.0 and newer):
  dmesg -T

- Show kernel messages in human-readable form (available in kernels 3.5.0 and newer):
  dmesg -H

- Colorize output (available in kernels 3.5.0 and newer):
  dmesg -L
```

9-Search grep

1. Search any line that contains the word in filename on Linux:

```
grep 'word' filename
```

2. Perform a case-insensitive search for the word ‘bar’ in Linux and Unix:

```
grep -i 'bar' file1
```

3. Look for all files in the current directory and in all of its subdirectories in Linux for the word ‘httpd’:

```
grep -R 'httpd' .
```

4. Search and display the total number of times that the string ‘nixcraft’ appears in a file named frontpage.md:

```
grep -c 'nixcraft' frontpage.md
```

```
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ sudo grep passwd -R /etc/
[sudo] password for moatasem:
/etc/rpc:yppasswdd      100009  yppasswd
/etc/gnome/menus.blacklist:kde4/kdepasswd.desktop
/etc/nsswitch.conf:passwd:         files systemd
/etc/default/nss:#  If set to TRUE, the passwd routines in the NIS NSS module will not
/etc/default/nss:#  use the passwd.adjunct.byname tables to fill in the password data
/etc/default/nss:#  in the passwd structure.  This is a security problem if the NIS
/etc/default/nss:#  server cannot be trusted to send the passwd.adjuct table only to
/etc/default/nss:#  privileged clients.  Instead the passwd.adjunct.byname table is
/etc/security/pwquality.conf:# Whether to check for the words from the passwd entry GECOS string of the u
/etc/security/pwquality.conf:# /etc/passwd file.
/etc/security/namespace.init:         passwd=$(getent passwd "$user")
/etc/security/namespace.init:         homedir=$(echo "$passwd" | cut -f6 -d":")
/etc/security/namespace.init:         gid=$(echo "$passwd" | cut -f4 -d":")
/etc/security/faillock.conf:# in /etc/passwd and ignore centralized (AD, IdM, LDAP, etc.) users.
/etc/bindresvport.blacklist:774 # rpasswd
/etc/services:kpasswd           464/tcp
/etc/services:kpasswd           464/udp
/etc/services:passwd-server     752/udp         passwd_server   # Kerberos passwd server
grep: /etc/pulse/client.conf.d/01-enable-autospawn.conf: No such file or directory
grep: /etc/network/if-post-down.d/avahi-daemon: No such file or directory
/etc/pam.d/passwd:# The PAM configuration file for the Shadow `passwd' service
/etc/pam.d/chfn:# NIS (man nsswitch) as well as normal /etc/passwd and
/etc/pam.d/chpasswd:# The PAM configuration file for the Shadow 'chpasswd' service
/etc/pam.d/su:# NIS (man nsswitch) as well as normal /etc/passwd and
/etc/pam.d/chsh:# NIS (man nsswitch) as well as normal /etc/passwd and
/etc/adduser.conf:# Please note that system software, such as the users allocated by the base-passwd
/etc/apparmor.d/abstractions/authentication:  /etc/default/passwd         r,
/etc/apparmor.d/abstractions/ubuntu-browsers.d/java:    /etc/passwd m,
```

```
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ grep "moatasem" -R .
./file.txt:moatasem
./folder/display.txt:moatasem
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$
```

```
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt
Welcome Linux Group
 New Line
moatasem
thank you
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt  | grep moatasem
moatasem
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt  | grep -c moatasem
1
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt  | grep -v moatasem
Welcome Linux Group
 New Line
thank you
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt  | grep -i MOATASEM
moatasem
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt  | grep -ni MOATASEM
3:moatasem
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ cat file.txt  | grep -ni MOATASEM^C
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$ grep -r moatasem .
./file.txt:moatasem
moatasem@moatasem-VirtualBox:~/Desktop/Embedded_Linux$
```

```
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$ grep -E '(Moatasem|this)' file
how many new keyword in this file ?
Moatasem Elsayed
Moatasem Elsayed
this text is very new
how many new in this file ?
Moatasem Elsayed
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/sed$
```

find

```
1
2
```

```
# find . -name tecmint.txt

./tecmint.txt
# find /home -iname tecmint.txt

./tecmint.txt
./Tecmint.txt
# find . -type f -perm 0777 -print
```

```
# find / -type f -perm 0777 -print -exec chmod 644 {} \;
# find . -type f -name "tecmint.txt" -exec rm -f {} \;
```

```
# find / -type d -name Tecmint

/Tecmint
# find . -type f -name tecmint.php

./tecmint.php
```

To find all the files which are modified **50** days back.

```
# find / -mtime 50
```

To find all the files which are accessed **50** days back.

```
# find / -atime 50
```

```
# find / -size 50M
```

```
# find / -size +50M -size -100M
```

Utils

- Nautilus
- Bc
- cal/date
- clear/ ctrl +L
- Sort | uniq
- Reset
- Sleep
- Locate
- Stat
- Tree
- History
- Display
- wc
- Exit
- Unalias

```
^C
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$ echo "hello" |base64
aGVsbG8K
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$ echo "hello" | sha256sum
5891b5b522d5df086d0ff0b110fbd9d21bb4fc7163af34d08286a2e846f6be03  -
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$ echo "hello" | md5sum
b1946ac92492d2347c6235b4d2611184  -
moatsem@moatsem-IdeaPad-Gaming-3-15IAH7:~$
```

Tasks

- Using vim to write c++ code
  Example : ./a.out -m 23 -h 1 -d monday <task>
- Search about this commands (nl , pushd,seq,shutdown ,reboot,tee,test,time,xargs,strings)
- See Dr Arabway videos about 102: Understanding Linux
  https://www.youtube.com/playlist?list=PLWXRxAK4bUzc9gq-W2xWDe9zEaDcowLfs
- Understand pipe,fifo (system calls)

```c
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <fcntl.h>

int main() {
    // Open the named pipe (FIFO) for reading
    const char *fifo_path = "/tmp/myfifo";
    int fifo_fd = open(fifo_path, O_RDONLY);
    if (fifo_fd == -1) {
        perror("open");
        exit(EXIT_FAILURE);
    }

    // Read data from the FIFO
    char buffer[1024];
    ssize_t bytes_read = read(fifo_fd, buffer, sizeof(buffer));

    if (bytes_read > 0) {
        buffer[bytes_read] = '\0';
        printf("Reader received: %s", buffer);
    }

    close(fifo_fd);

    return 0;
}
```

```c
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <fcntl.h>
#include <string.h>

int main() {
    // Create or open the named pipe (FIFO)
    const char *fifo_path = "/tmp/myfifo";
    if (mkfifo(fifo_path, 0666) == -1) {
        perror("mkfifo");
        exit(EXIT_FAILURE);
    }

    int fifo_fd = open(fifo_path, O_WRONLY);
    if (fifo_fd == -1) {
        perror("open");
        exit(EXIT_FAILURE);
    }

    // Write data to the FIFO
    char message[] = "Hello, reader!\n";
    write(fifo_fd, message, strlen(message));

    close(fifo_fd);

    return 0;
}
```

```
moatsen@moatsen-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/pipe$ ./a.out hello
hello
moatsen@moatsen-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/pipe$ cat main.c
#include <sys/types.h>
       #include <sys/wait.h>
       #include <stdio.h>
       #include <stdlib.h>
       #include <unistd.h>
       #include <string.h>

       int
       main(int argc, char *argv[])
       {
           int pipefd[2];
           pid_t cpid;
           char buf;

           if (argc != 2) {
               fprintf(stderr, "Usage: %s <string>\n", argv[0]);
               exit(EXIT_FAILURE);
           }

           if (pipe(pipefd) == -1) {
               perror("pipe");
               exit(EXIT_FAILURE);
           }

           cpid = fork();
           if (cpid == -1) {
               perror("fork");
               exit(EXIT_FAILURE);
           }

           if (cpid == 0) {    /* Child reads from pipe */
               close(pipefd[1]);          /* Close unused write end */

               while (read(pipefd[0], &buf, 1) > 0)
                   write(STDOUT_FILENO, &buf, 1);

               write(STDOUT_FILENO, "\n", 1);
               close(pipefd[0]);
               _exit(EXIT_SUCCESS);

           } else {            /* Parent writes argv[1] to pipe */
               close(pipefd[0]);          /* Close unused read end */
               write(pipefd[1], argv[1], strlen(argv[1]));
               close(pipefd[1]);          /* Reader will see EOF */
               wait(NULL);                /* Wait for child */
               exit(EXIT_SUCCESS);
           }
       }
moatsen@moatsen-IdeaPad-Gaming-3-15IAH7:~/Diploma/mypresetation/03Linux/03_commands/pipe$
```