

• MobaXterm Personal Edition v23.4 •
(SSH client, X server and network tools)

- SSH session to **vm1@192.168.1.185**
 - Direct SSH : ✓
 - SSH compression : ✓
 - SSH-browser : ✓
 - X11-forwarding : ✓ (remote display is forwarded through SSH)
- For more info, ctrl+click on [help](#) or visit our [website](#).

Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.8.0-71-generic x86_64)

* Documentation: <https://help.ubuntu.com>
* Management: <https://landscape.canonical.com>
* Support: <https://ubuntu.com/pro>

System information as of Fri Oct 17 09:45:18 PM UTC 2025

System load:	0.17	Processes:	230
Usage of /:	53.0% of 9.75GB	Users logged in:	1
Memory usage:	17%	IPv4 address for ens33:	192.168.1.185
Swap usage:	0%		

Expanded Security Maintenance for Applications is not enabled.

72 updates can be applied immediately.
42 of these updates are standard security updates.
To see these additional updates run: `apt list --upgradable`

Enable ESM Apps to receive additional future security updates.
See <https://ubuntu.com/esm> or run: `sudo pro status`

Failed to connect to <https://changelogs.ubuntu.com/meta-release-lts>. Check your Internet connection or proxy settings

Last login: Fri Oct 17 21:21:52 2025 from 192.168.1.173

vm1@vm1:~\$

vm1@vm1:~\$

vm1@vm1:~\$ ll

```
total 44
drwxr-x--- 4 vm1  vm1  4096 Oct 17 21:45 ./
drwxr-xr-x 3 root root  4096 Oct 17 02:44 ../
-rw----- 1 vm1  vm1  1798 Oct 17 14:53 .bash_history
-rw-r--r-- 1 vm1  vm1   220 Mar 31  2024 .bash_logout
-rw-r--r-- 1 vm1  vm1  3771 Mar 31  2024 .bashrc
drwx----- 2 vm1  vm1  4096 Oct 17 02:45 .cache/
-rw----- 1 vm1  vm1    20 Oct 17 21:18 .lessht
-rw-r--r-- 1 vm1  vm1   807 Mar 31  2024 .profile
drwx----- 2 vm1  vm1  4096 Oct 17 02:45 .ssh/
```

```

-rw-r--r-- 1 vm1 vm1      0 Oct 17 02:46 .sudo_as_admin_successful
-rw----- 1 vm1 vm1  2763 Oct 17 21:26 .viminfo
-rw----- 1 vm1 vm1    98 Oct 17 21:45 .Xauthority
vm1@vm1:~$ cd /tmp/
vm1@vm1:/tmp$ mkdir Assignments
vm1@vm1:/tmp$ cat > employees.csv
Ahmed,24,Developer,Cairo,45000
Fatma,29,Manager,Alexandria,65000
Omar,22,Intern,Giza,15000
Nour,31,Engineer,Cairo,55000
Youssef,27,Developer,Mansoura,48000
Mona,35,Manager,Cairo,70000
Karim,23,Designer,Alexandria,35000
Layla,28,Engineer,Giza,52000
Hassan,26,Developer,Cairo,46000
Aya,30,Analyst,Mansoura,41000
Mahmoud,33,Manager,Cairo,68000
Salma,25,Designer,Alexandria,38000
Khaled,29,Engineer,Giza,54000
Dina,24,Developer,Mansoura,44000
Amr,32,Analyst,Cairo,43000^C
vm1@vm1:/tmp$ cat employees.csv
Ahmed,24,Developer,Cairo,45000
Fatma,29,Manager,Alexandria,65000
Omar,22,Intern,Giza,15000
Nour,31,Engineer,Cairo,55000
Youssef,27,Developer,Mansoura,48000
Mona,35,Manager,Cairo,70000
Karim,23,Designer,Alexandria,35000
Layla,28,Engineer,Giza,52000
Hassan,26,Developer,Cairo,46000
Aya,30,Analyst,Mansoura,41000
Mahmoud,33,Manager,Cairo,68000
Salma,25,Designer,Alexandria,38000
Khaled,29,Engineer,Giza,54000
Dina,24,Developer,Mansoura,44000
vm1@vm1:/tmp$ ll
total 68
drwxrwxrwt 16 root root 4096 Oct 17 21:47 ./
drwxr-xr-x 23 root root 4096 Oct 17 02:25 ../
drwxrwxr-x  2 vm1 vm1  4096 Oct 17 21:47 Assignments/
-rw-rw-r--  1 vm1 vm1   439 Oct 17 21:48 employees.csv
drwxrwxrwt  2 root root 4096 Oct 17 17:54 .font-unix/
drwxrwxrwt  2 root root 4096 Oct 17 17:54 .ICE-unix/
drwx-----  2 root root 4096 Oct 17 17:54 snap-private-tmp/
drwx-----  3 root root 4096 Oct 17 18:26 systemd-private-814096b245994b31880faeab4
66490ca-fwupd.service-6RKUvz/
drwx-----  3 root root 4096 Oct 17 17:54 systemd-private-814096b245994b31880faeab4
66490ca-ModemManager.service-2Wgu0m/
drwx-----  3 root root 4096 Oct 17 17:54 systemd-private-814096b245994b31880faeab4
66490ca-polkit.service-581rXc/
drwx-----  3 root root 4096 Oct 17 17:54 systemd-private-814096b245994b31880faeab4
66490ca-systemd-logind.service-AfDjKl/
drwx-----  3 root root 4096 Oct 17 17:54 systemd-private-814096b245994b31880faeab4
66490ca-systemd-resolved.service-7Ib7C7/

```

```

drwx----- 3 root root 4096 Oct 17 17:54 systemd-private-814096b245994b31880faeab4
66490ca-systemd-timesyncd.service-r9UxjM/
drwx----- 3 root root 4096 Oct 17 18:26 systemd-private-814096b245994b31880faeab4
66490ca-upower.service-TdvvTL/
drwx----- 2 root root 4096 Oct 17 17:54 vmware-root_736-2991268455/
drwxrwxrwt 2 root root 4096 Oct 17 17:54 .X11-unix/
drwxrwxrwt 2 root root 4096 Oct 17 17:54 .XIM-unix/
vm1@vm1:/tmp$ cat employees.csv
Ahmed,24,Developer,Cairo,45000
Fatma,29,Manager,Alexandria,65000
Omar,22,Intern,Giza,15000
Nour,31,Engineer,Cairo,55000
Youssef,27,Developer,Mansoura,48000
Mona,35,Manager,Cairo,70000
Karim,23,Designer,Alexandria,35000
Layla,28,Engineer,Giza,52000
Hassan,26,Developer,Cairo,46000
Aya,30,Analyst,Mansoura,41000
Mahmoud,33,Manager,Cairo,68000
Salma,25,Designer,Alexandria,38000
Khaled,29,Engineer,Giza,54000
Dina,24,Developer,Mansoura,44000
vm1@vm1:/tmp$ grep "Cairo"employees.csv
^C
vm1@vm1:/tmp$ grep "Cairo" employees.csv
Ahmed,24,Developer,Cairo,45000
Nour,31,Engineer,Cairo,55000
Mona,35,Manager,Cairo,70000
Hassan,26,Developer,Cairo,46000
Mahmoud,33,Manager,Cairo,68000
vm1@vm1:/tmp$ grep "Developer" employees.csv | awk -F',' '{print NR, NF, $0}' empl
oyees.csv
1 5 Ahmed,24,Developer,Cairo,45000
2 5 Fatma,29,Manager,Alexandria,65000
3 5 Omar,22,Intern,Giza,15000
4 5 Nour,31,Engineer,Cairo,55000
5 5 Youssef,27,Developer,Mansoura,48000
6 5 Mona,35,Manager,Cairo,70000
7 5 Karim,23,Designer,Alexandria,35000
8 5 Layla,28,Engineer,Giza,52000
9 5 Hassan,26,Developer,Cairo,46000
10 5 Aya,30,Analyst,Mansoura,41000
11 5 Mahmoud,33,Manager,Cairo,68000
12 5 Salma,25,Designer,Alexandria,38000
13 5 Khaled,29,Engineer,Giza,54000
14 5 Dina,24,Developer,Mansoura,44000
vm1@vm1:/tmp$ grep "Developer" employees.csv | awk -F',' '{print NR, $0}' employee
s.csv
1 Ahmed,24,Developer,Cairo,45000
2 Fatma,29,Manager,Alexandria,65000
3 Omar,22,Intern,Giza,15000
4 Nour,31,Engineer,Cairo,55000
5 Youssef,27,Developer,Mansoura,48000
6 Mona,35,Manager,Cairo,70000
7 Karim,23,Designer,Alexandria,35000
8 Layla,28,Engineer,Giza,52000

```

```

9 Hassan,26,Developer,Cairo,46000
10 Aya,30,Analyst,Mansoura,41000
11 Mahmoud,33,Manager,Cairo,68000
12 Salma,25,Designer,Alexandria,38000
13 Khaled,29,Engineer,Giza,54000
14 Dina,24,Developer,Mansoura,44000
vm1@vm1:/tmp$ grep "Developer" employees.csv | awk -F',' '{print NR, $0}'
1 Ahmed,24,Developer,Cairo,45000
2 Youssef,27,Developer,Mansoura,48000
3 Hassan,26,Developer,Cairo,46000
4 Dina,24,Developer,Mansoura,44000
vm1@vm1:/tmp$ awk '{print $1, $5}' employees.csv
Ahmed,24,Developer,Cairo,45000
Fatma,29,Manager,Alexandria,65000
Omar,22,Intern,Giza,15000
Nour,31,Engineer,Cairo,55000
Youssef,27,Developer,Mansoura,48000
Mona,35,Manager,Cairo,70000
Karim,23,Designer,Alexandria,35000
Layla,28,Engineer,Giza,52000
Hassan,26,Developer,Cairo,46000
Aya,30,Analyst,Mansoura,41000
Mahmoud,33,Manager,Cairo,68000
Salma,25,Designer,Alexandria,38000
Khaled,29,Engineer,Giza,54000
Dina,24,Developer,Mansoura,44000
vm1@vm1:/tmp$ awk --help
Usage: awk [POSIX or GNU style options] -f progfile [--] file ...
Usage: awk [POSIX or GNU style options] [--] 'program' file ...
POSIX options:          GNU long options: (standard)
    -f progfile          --file=progfile
    -F fs                --field-separator=fs
    -v var=val           --assign=var=val
Short options:          GNU long options: (extensions)
    -b                  --characters-as-bytes
    -c                  --traditional
    -C                  --copyright
    -d[file]            --dump-variables[=file]
    -D[file]            --debug[=file]
    -e 'program-text'   --source='program-text'
    -E file             --exec=file
    -g                  --gen-pot
    -h                  --help
    -i includefile      --include=includefile
    -I                  --trace
    -l library           --load=library
    -L[fatal|invalid|no-ext] --lint[=fatal|invalid|no-ext]
    -M                  --bignum
    -N                  --use-lc-numeric
    -n                  --non-decimal-data
    -o[file]            --pretty-print[=file]
    -O                  --optimize
    -p[file]            --profile[=file]
    -P                  --posix
    -r                  --re-interval

```

-s	--no-optimize
-S	--sandbox
-t	--lint-old
-V	--version

To report bugs, use the ``gawkbug'` program.
 For full instructions, see the node ``Bugs'` in ``gawk.info'`
 which is section ``Reporting Problems and Bugs'` in the
 printed version. This same information may be found at
https://www.gnu.org/software/gawk/manual/html_node/Bugs.html.
 PLEASE do NOT try to report bugs by posting in comp.lang.awk,
 or by using a web forum such as Stack Overflow.

gawk is a pattern scanning and processing language.
 By default it reads standard input and writes standard output.

Examples:

```
awk '{ sum += $1 }; END { print sum }' file
awk -F: '{ print $1 }' /etc/passwd
vm1@vm1:/tmp$ awk -F ',' '{print $1, $5}' employees.csv
Ahmed 45000
Fatma 65000
Omar 15000
Nour 55000
Youssef 48000
Mona 70000
Karim 35000
Layla 52000
Hassan 46000
Aya 41000
Mahmoud 68000
Salma 38000
Khaled 54000
Dina 44000
vm1@vm1:/tmp$ awk -F ',' '{print $1, $5}' employees.csv | sort
Ahmed 45000
Aya 41000
Dina 44000
Fatma 65000
Hassan 46000
Karim 35000
Khaled 54000
Layla 52000
Mahmoud 68000
Mona 70000
Nour 55000
Omar 15000
Salma 38000
Youssef 48000
vm1@vm1:/tmp$ sort --help
Usage: sort [OPTION]... [FILE]...
  or:  sort [OPTION]... --files0-from=F
Write sorted concatenation of all FILE(s) to standard output.
```

With no FILE, or when FILE is -, read standard input.

Mandatory arguments to long options are mandatory for short options too.
Ordering options:

-b, --ignore-leading-blanks	ignore leading blanks
-d, --dictionary-order	consider only blanks and alphanumeric characters
-f, --ignore-case	fold lower case to upper case characters
-g, --general-numeric-sort	compare according to general numerical value
-i, --ignore-nonprinting	consider only printable characters
-M, --month-sort	compare (unknown) < 'JAN' < ... < 'DEC'
-h, --human-numeric-sort	compare human readable numbers (e.g., 2K 1G)
-n, --numeric-sort	compare according to string numerical value
-R, --random-sort	shuffle, but group identical keys. See shuf(1)
--random-source=FILE	get random bytes from FILE
-r, --reverse	reverse the result of comparisons
--sort=WORD	sort according to WORD: general-numeric -g, human-numeric -h, month -M, numeric -n, random -R, version -V
-V, --version-sort	natural sort of (version) numbers within text

Other options:

--batch-size=NMERGE	merge at most NMERGE inputs at once; for more use temp files
-c, --check, --check=diagnose-first	check for sorted input; do not sort
-C, --check=quiet, --check=silent	like -c, but do not report first bad line
--compress-program=PROG	compress temporaries with PROG; decompress them with PROG -d
--debug	annotate the part of the line used to sort, and warn about questionable usage to stderr
--files0-from=F	read input from the files specified by NUL-terminated names in file F; If F is - then read names from standard input
-k, --key=KEYDEF	sort via a key; KEYDEF gives location and type
-m, --merge	merge already sorted files; do not sort
-o, --output=FILE	write result to FILE instead of standard output
-s, --stable	stabilize sort by disabling last-resort comparison
-S, --buffer-size=SIZE	use SIZE for main memory buffer
-t, --field-separator=SEP	use SEP instead of non-blank to blank transition
-T, --temporary-directory=DIR	use DIR for temporaries, not \$TMPDIR or /tmp; multiple options specify multiple directories
--parallel=N	change the number of sorts run concurrently to N
-u, --unique	with -c, check for strict ordering; without -c, output only the first of an equal run
-z, --zero-terminated	line delimiter is NUL, not newline
--help	display this help and exit
--version	output version information and exit

KEYDEF is F[.C][OPTS][,F[.C][OPTS]] for start and stop position, where F is a field number and C a character position in the field; both are origin 1, and the stop position defaults to the line's end. If neither -t nor -b is in effect, characters in a field are counted from the beginning of the preceding whitespace. OPTS is one or more single-letter ordering options [bdfgiMhnRrV], which override global ordering options for that key. If no key is given, use the entire line as the key. Use --debug to diagnose incorrect key usage.

SIZE may be followed by the following multiplicative suffixes:
% 1% of memory, b 1, K 1024 (default), and so on for M, G, T, P, E, Z, Y, R, Q.

*** WARNING ***

The locale specified by the environment affects sort order.
Set LC_ALL=C to get the traditional sort order that uses
native byte values.

GNU coreutils online help: <<https://www.gnu.org/software/coreutils/>>

Full documentation <<https://www.gnu.org/software/coreutils/sort>>

or available locally via: info '(coreutils) sort invocation'

```
vm1@vm1:/tmp$ sort -k$5 -t',' employees.csv
```

```
sort: invalid number at field start: invalid count at start of '-t','
```

```
vm1@vm1:/tmp$ sort -t -n -k$5
```

```
sort: multi-character tab '-n'
```

```
vm1@vm1:/tmp$ sort -t',' -n -k$5 employees.csv
```

```
sort: invalid number at field start: invalid count at start of 'employees.csv'
```

```
vm1@vm1:/tmp$ awk -F ',' '{print $1, $5}' employees.csv | sort -t',' -n -k$5
```

```
sort: option requires an argument -- 'k'
```

```
Try 'sort --help' for more information.
```

```
vm1@vm1:/tmp$ awk -F ',' '{print $1, $5}' employees.csv | sort -t',' -n
```

```
Ahmed 45000
```

```
Aya 41000
```

```
Dina 44000
```

```
Fatma 65000
```

```
Hassan 46000
```

```
Karim 35000
```

```
Khaled 54000
```

```
Layla 52000
```

```
Mahmoud 68000
```

```
Mona 70000
```

```
Nour 55000
```

```
Omar 15000
```

```
Salma 38000
```

```
Youssef 48000
```

```
vm1@vm1:/tmp$ awk -F ',' '{print $1, $5}' employees.csv | sort -t',' -n -k5
```

```
Ahmed 45000
```

```
Aya 41000
```

```
Dina 44000
```

```
Fatma 65000
```

```
Hassan 46000
```

```
Karim 35000
```

```
Khaled 54000
```

```
Layla 52000
```

```
Mahmoud 68000
```

```
Mona 70000
```

```
Nour 55000
```

```
Omar 15000
```

```
Salma 38000
```

```
Youssef 48000
```

```
vm1@vm1:/tmp$ awk -F ',' '{print $1, $5}' employees.csv | sort -t',' -n -k5,5
```

```
Ahmed 45000
```

```
Aya 41000
```

```
Dina 44000
```

Fatma 65000
Hassan 46000
Karim 35000
Khaled 54000
Layla 52000
Mahmoud 68000
Mona 70000
Nour 55000
Omar 15000
Salma 38000
Youssef 48000

```
vm1@vm1:/tmp$ sort -t',' -n -k5 employees.csv
```

Omar,22,Intern,Giza,15000
Karim,23,Designer,Alexandria,35000
Salma,25,Designer,Alexandria,38000
Aya,30,Analyst,Mansoura,41000
Dina,24,Developer,Mansoura,44000
Ahmed,24,Developer,Cairo,45000
Hassan,26,Developer,Cairo,46000
Youssef,27,Developer,Mansoura,48000
Layla,28,Engineer,Giza,52000
Khaled,29,Engineer,Giza,54000
Nour,31,Engineer,Cairo,55000
Fatma,29,Manager,Alexandria,65000
Mahmoud,33,Manager,Cairo,68000
Mona,35,Manager,Cairo,70000

```
vm1@vm1:/tmp$ sort -t',' -n -k5 -r employees.csv
```

Mona,35,Manager,Cairo,70000
Mahmoud,33,Manager,Cairo,68000
Fatma,29,Manager,Alexandria,65000
Nour,31,Engineer,Cairo,55000
Khaled,29,Engineer,Giza,54000
Layla,28,Engineer,Giza,52000
Youssef,27,Developer,Mansoura,48000
Hassan,26,Developer,Cairo,46000
Ahmed,24,Developer,Cairo,45000
Dina,24,Developer,Mansoura,44000
Aya,30,Analyst,Mansoura,41000
Salma,25,Designer,Alexandria,38000
Karim,23,Designer,Alexandria,35000
Omar,22,Intern,Giza,15000

```
vm1@vm1:/tmp$ sort -t',' -n -k5 -r employees.csv > high_earners.txt
```

```
vm1@vm1:/tmp$ sort -t',' -n -k5 employees.csv | awk -F ',' '{print $1, $5}' employees.csv
```

Ahmed 45000
Fatma 65000
Omar 15000
Nour 55000
Youssef 48000
Mona 70000
Karim 35000
Layla 52000
Hassan 46000
Aya 41000
Mahmoud 68000
Salma 38000


```

Khaled 54000
Dina 44000
vm1@vm1:/tmp$ sort -t',' -n -k5 -r employees.csv | awk -F ',' '{print $1, $5}' emp
loyees.csv
Ahmed 45000
Fatma 65000
Omar 15000
Nour 55000
Youssef 48000
Mona 70000
Karim 35000
Layla 52000
Hassan 46000
Aya 41000
Mahmoud 68000
Salma 38000
Khaled 54000
Dina 44000
vm1@vm1:/tmp$ sort -t',' -n -k5 -r employees.csv | awk -F ',' '{print $1, $5}'
Mona 70000
Mahmoud 68000
Fatma 65000
Nour 55000
Khaled 54000
Layla 52000
Youssef 48000
Hassan 46000
Ahmed 45000
Dina 44000
Aya 41000
Salma 38000
Karim 35000
Omar 15000
vm1@vm1:/tmp$ awk -F ',' $2 > 25 > 30
Usage: awk [POSIX or GNU style options] -f progfile [--] file ...
Usage: awk [POSIX or GNU style options] [--] 'program' file ...
POSIX options:          GNU long options: (standard)
    -f progfile          --file=progfile
    -F fs                --field-separator=fs
    -v var=val           --assign=var=val
Short options:          GNU long options: (extensions)
    -b                  --characters-as-bytes
    -c                  --traditional
    -C                  --copyright
    -d[file]            --dump-variables[=file]
    -D[file]            --debug[=file]
    -e 'program-text'   --source='program-text'
    -E file             --exec=file
    -g                  --gen-pot
    -h                  --help
    -i includefile      --include=includefile
    -I                  --trace
    -l library          --load=library
    -L[fatal|invalid|no-ext] --lint[=fatal|invalid|no-ext]
    -M                  --bignum

```

-N	--use-lc-numeric
-n	--non-decimal-data
-o[file]	--pretty-print[=file]
-O	--optimize
-p[file]	--profile[=file]
-P	--posix
-r	--re-interval
-s	--no-optimize
-S	--sandbox
-t	--lint-old
-V	--version

To report bugs, use the ``gawkgbug'` program.
 For full instructions, see the node ``Bugs'` in ``gawk.info'`
 which is section ``Reporting Problems and Bugs'` in the
 printed version. This same information may be found at
https://www.gnu.org/software/gawk/manual/html_node/Bugs.html.
 PLEASE do NOT try to report bugs by posting in comp.lang.awk,
 or by using a web forum such as Stack Overflow.

gawk is a pattern scanning and processing language.
 By default it reads standard input and writes standard output.

Examples:

```
awk '{ sum += $1 }; END { print sum }' file
awk -F: '{ print $1 }' /etc/passwd
```

```
vm1@vm1:/tmp$ awk -F ',' $2 > 25
```

```
Usage: awk [POSIX or GNU style options] -f progfile [--] file ...
```

```
Usage: awk [POSIX or GNU style options] [--] 'program' file ...
```

POSIX options: GNU long options: (standard)

-f progfile	--file=progfile
-F fs	--field-separator=fs
-v var=val	--assign=var=val

Short options: GNU long options: (extensions)

-b	--characters-as-bytes
-c	--traditional
-C	--copyright
-d[file]	--dump-variables[=file]
-D[file]	--debug[=file]
-e 'program-text'	--source='program-text'
-E file	--exec=file
-g	--gen-pot
-h	--help
-i includefile	--include=includefile
-I	--trace
-l library	--load=library
-L[fatal invalid no-ext]	--lint[=fatal invalid no-ext]
-M	--bignum
-N	--use-lc-numeric
-n	--non-decimal-data
-o[file]	--pretty-print[=file]
-O	--optimize
-p[file]	--profile[=file]
-P	--posix
-r	--re-interval

```

-s                --no-optimize
-S                --sandbox
-t                --lint-old
-V                --version

```

To report bugs, use the `gawkbug' program.
 For full instructions, see the node `Bugs' in `gawk.info' which is section `Reporting Problems and Bugs' in the printed version. This same information may be found at https://www.gnu.org/software/gawk/manual/html_node/Bugs.html. PLEASE do NOT try to report bugs by posting in comp.lang.awk, or by using a web forum such as Stack Overflow.

gawk is a pattern scanning and processing language.
 By default it reads standard input and writes standard output.

Examples:

```

    awk '{ sum += $1 }; END { print sum }' file
    awk -F: '{ print $1 }' /etc/passwd
vm1@vm1:/tmp$ awk -F ',' '$2 > 25' employees.csv
Fatma,29,Manager,Alexandria,65000
Nour,31,Engineer,Cairo,55000
Youssef,27,Developer,Mansoura,48000
Mona,35,Manager,Cairo,70000
Layla,28,Engineer,Giza,52000
Hassan,26,Developer,Cairo,46000
Aya,30,Analyst,Mansoura,41000
Mahmoud,33,Manager,Cairo,68000
Khaled,29,Engineer,Giza,54000
vm1@vm1:/tmp$ awk -F ',' '$2 > 25 > 30' employees.csv
awk: cmd. line:1: $2 > 25 > 30
awk: cmd. line:1:      ^ syntax error
vm1@vm1:/tmp$ awk -F ',' '$2 > 25 && 30' employees.csv
Fatma,29,Manager,Alexandria,65000
Nour,31,Engineer,Cairo,55000
Youssef,27,Developer,Mansoura,48000
Mona,35,Manager,Cairo,70000
Layla,28,Engineer,Giza,52000
Hassan,26,Developer,Cairo,46000
Aya,30,Analyst,Mansoura,41000
Mahmoud,33,Manager,Cairo,68000
Khaled,29,Engineer,Giza,54000
vm1@vm1:/tmp$ awk -F ',' '$2 > 25 && $2 < 30' employees.csv
Fatma,29,Manager,Alexandria,65000
Youssef,27,Developer,Mansoura,48000
Layla,28,Engineer,Giza,52000
Hassan,26,Developer,Cairo,46000
Khaled,29,Engineer,Giza,54000
vm1@vm1:/tmp$ awk -F ',' '$2 >= 25 && $2 <= 30' employees.csv
Fatma,29,Manager,Alexandria,65000
Youssef,27,Developer,Mansoura,48000
Layla,28,Engineer,Giza,52000
Hassan,26,Developer,Cairo,46000
Aya,30,Analyst,Mansoura,41000
Salma,25,Designer,Alexandria,38000

```

```

Khaled,29,Engineer,Giza,54000
vm1@vm1:/tmp$ awk -F',' '{sum += $5} END, sum/NR}' employees.csv
> ^C
vm1@vm1:/tmp$ awk -F',' '{sum += $5} END , sum/NR}' employees.csv
> ;
> '
awk: cmd. line:1: +=
awk: cmd. line:1: ^ syntax error
vm1@vm1:/tmp$ awk -F',' '{sum += $5} END {pring "Average Salary:" , sum/NR}' employees.csv
> awk -F ',' '$2 > 25 > 30' employees.csv ^C
vm1@vm1:/tmp$ awk -F ',' '$2 >= 25 && $2 <= 30' employees.csv
Fatma,29,Manager,Alexandria,65000
Youssef,27,Developer,Mansoura,48000
Layla,28,Engineer,Giza,52000
Hassan,26,Developer,Cairo,46000
Aya,30,Analyst,Mansoura,41000
Salma,25,Designer,Alexandria,38000
Khaled,29,Engineer,Giza,54000
vm1@vm1:/tmp$ awk -F ',' '{sum += $5} END {pring "Average Salary:" , sum/NR}' employees.csv
> ^C
vm1@vm1:/tmp$ awk -F ',' '{sum += $5} END {pring "Average Salary:" , sum/NR}' employees.csv
awk: cmd. line:1: {sum += $5} END {pring "Average Salary:" , sum/NR}
awk: cmd. line:1: ^ syntax error
vm1@vm1:/tmp$ awk -F ',' '{sum += $5} END {pring "Average Salary:" ,sum/NR}' employees.csv
awk: cmd. line:1: {sum += $5} END {pring "Average Salary:" ,sum/NR}
awk: cmd. line:1: ^ syntax error
vm1@vm1:/tmp$ awk -F ',' '{sum += $5} END , sum/NR}' employees.csv
cmd. line:1: {sum += $5} END , sum/NR
awk: cmd. line:1: ^ syntax error
vm1@vm1:/tmp$ awk -F ',' '{sum += $5} END ,sum/NR}' employees.csv
vm1@vm1:/tmp$ awk -F ',' '{sum += $2} END {sum/NR}' employees.csv
vm1@vm1:/tmp$ awk -F',' '{sum += $5} END {print sum/NR}' employees.csv
48285.7
vm1@vm1:/tmp$ awk -F',' '{count[$4]++} END {for (x in count), print x, count[x]}' employees.csv
awk: cmd. line:1: {count[$4]++} END {for (x in count), print x, count[x]}
awk: cmd. line:1: ^ syntax error
vm1@vm1:/tmp$ awk -F',' '{count[$4]++} END {for (x in count) print x, count[x]}' employees.csv
Giza 3
Mansoura 3
Cairo 5
Alexandria 3
vm1@vm1:/tmp$ ^C
vm1@vm1:/tmp$

```

```

*** System restart required ***
Last login: Sat Oct 18 12:36:54 2025 from 192.168.1.52
vm1@vm1:~$ cd assignments/
vm1@vm1:~/assignments$ ls
employees.csv
vm1@vm1:~/assignments$ cat employees.csv
Ahmed,24,Developer,Cairo,45000
Fatma,29,Manager,Alexandria,65000
Omar,22,Intern,Giza,15000
Nour,31,Engineer,Cairo,55000
Youssef,27,Developer,Mansoura,48000
Mona,35,Manager,Cairo,70000
Karim,23,Designer,Alexandria,35000
Layla,28,Engineer,Giza,52000
Hassan,26,Developer,Cairo,46000
Aya,30,Analyst,Mansoura,41000
Mahmoud,33,Manager,Cairo,68000
Salma,25,Designer,Alexandria,38000
Khaled,29,Engineer,Giza,54000
Dina,24,Developer,Mansoura,44000
Amr,32,Analyst,Cairo,43000
vm1@vm1:~/assignments$ sed s/Developer/Software Engineer/g employees.csv >
updated_employees.csv
sed: -e expression #1, char 20: unterminated `s' command
vm1@vm1:~/assignments$ sed 's/Developer/Software Engineer/g' employees.csv >
updated_employees.csv
vm1@vm1:~/assignments$ cat updated_employees.csv
Ahmed,24,Software Engineer,Cairo,45000
Fatma,29,Manager,Alexandria,65000
Omar,22,Intern,Giza,15000
Nour,31,Engineer,Cairo,55000
Youssef,27,Software Engineer,Mansoura,48000
Mona,35,Manager,Cairo,70000
Karim,23,Designer,Alexandria,35000
Layla,28,Engineer,Giza,52000
Hassan,26,Software Engineer,Cairo,46000
Aya,30,Analyst,Mansoura,41000
Mahmoud,33,Manager,Cairo,68000
Salma,25,Designer,Alexandria,38000
Khaled,29,Engineer,Giza,54000
Dina,24,Software Engineer,Mansoura,44000
Amr,32,Analyst,Cairo,43000
vm1@vm1:~/assignments$ echo "Name, Age, Position, Govererate, Salary" | cat -
employees.csv > employees_with_header.csv
vm1@vm1:~/assignments$ cat employees_with_header.csv
Name, Age, Position, Govererate, Salary
Ahmed,24,Developer,Cairo,45000
Fatma,29,Manager,Alexandria,65000
Omar,22,Intern,Giza,15000
Nour,31,Engineer,Cairo,55000
Youssef,27,Developer,Mansoura,48000
Mona,35,Manager,Cairo,70000
Karim,23,Designer,Alexandria,35000
Layla,28,Engineer,Giza,52000

```

Hassan,26,Developer,Cairo,46000
Aya,30,Analyst,Mansoura,41000
Mahmoud,33,Manager,Cairo,68000
Salma,25,Designer,Alexandria,38000
Khaled,29,Engineer,Giza,54000
Dina,24,Developer,Mansoura,44000
Amr,32,Analyst,Cairo,43000
vm1@vm1:~/assignments\$