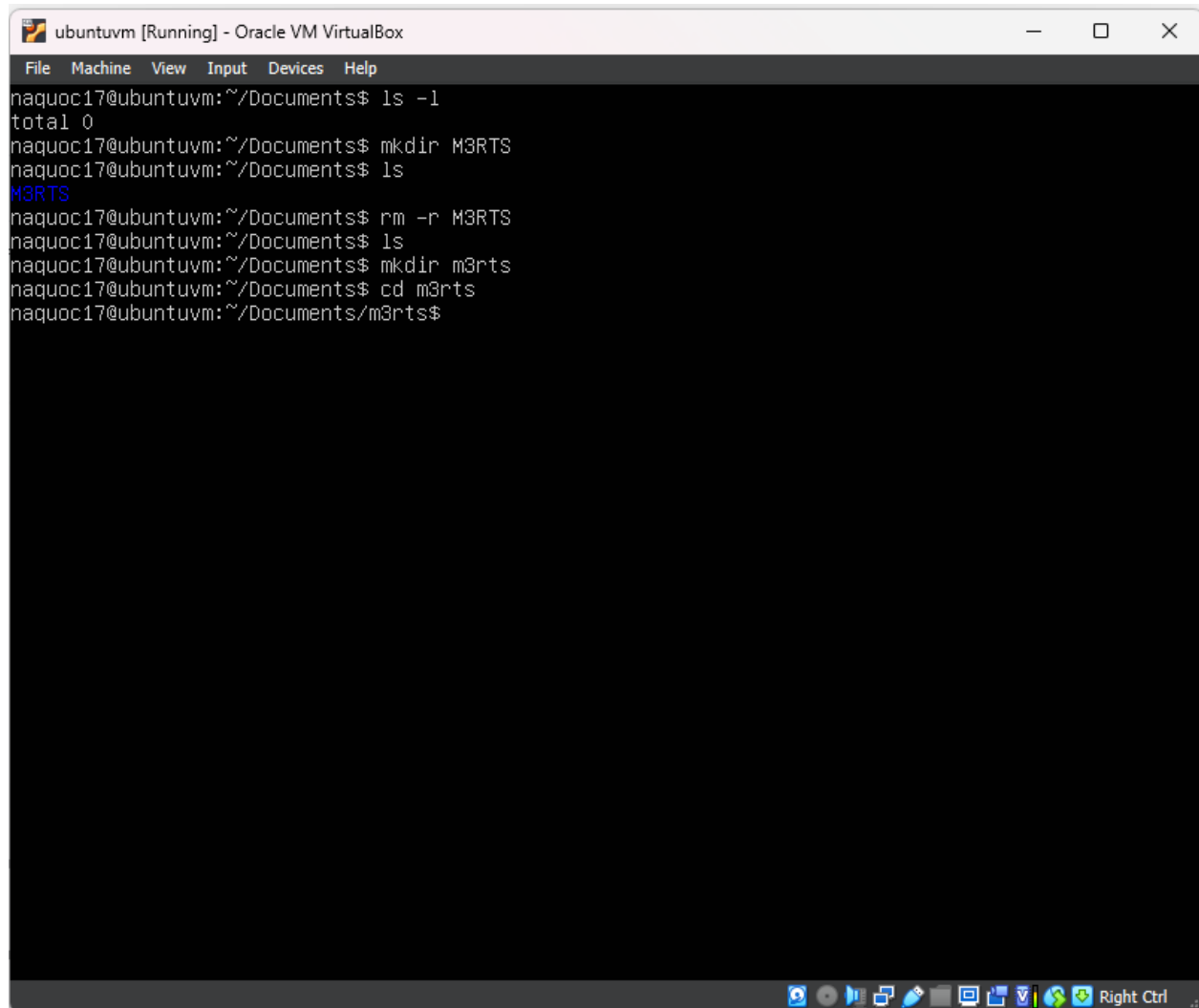


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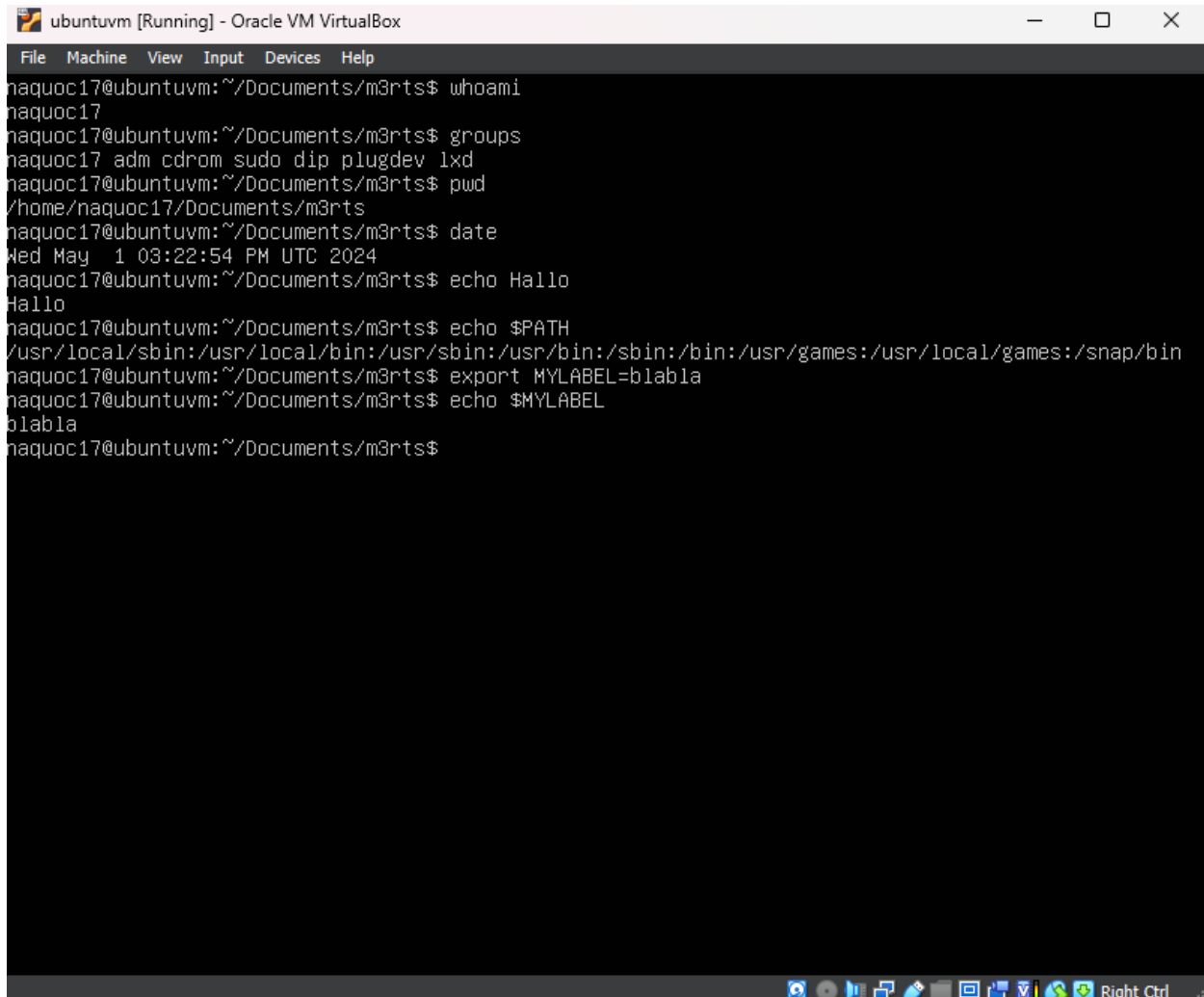
## Unix Basics



The screenshot shows a terminal window titled "ubuntuvm [Running] - Oracle VM VirtualBox". The terminal displays a series of commands and their outputs:

```
naquoc17@ubuntuvm:~/Documents$ ls -l
total 0
naquoc17@ubuntuvm:~/Documents$ mkdir M3RTS
naquoc17@ubuntuvm:~/Documents$ ls
M3RTS
naquoc17@ubuntuvm:~/Documents$ rm -r M3RTS
naquoc17@ubuntuvm:~/Documents$ ls
naquoc17@ubuntuvm:~/Documents$ mkdir m3rts
naquoc17@ubuntuvm:~/Documents$ cd m3rts
naquoc17@ubuntuvm:~/Documents/m3rts$
```

The terminal window has a menu bar with "File", "Machine", "View", "Input", "Devices", and "Help". At the bottom, there is a taskbar with various icons and the text "Right Ctrl".



```
ubuntuvm [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
naquoc17@ubuntuvm:~/Documents/m3rts$ whoami
naquoc17
naquoc17@ubuntuvm:~/Documents/m3rts$ groups
naquoc17 adm cdrom sudo dip plugdev lxd
naquoc17@ubuntuvm:~/Documents/m3rts$ pwd
/home/naquoc17/Documents/m3rts
naquoc17@ubuntuvm:~/Documents/m3rts$ date
Wed May 1 03:22:54 PM UTC 2024
naquoc17@ubuntuvm:~/Documents/m3rts$ echo Hallo
Hallo
naquoc17@ubuntuvm:~/Documents/m3rts$ echo $PATH
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin
naquoc17@ubuntuvm:~/Documents/m3rts$ export MYLABEL=blabla
naquoc17@ubuntuvm:~/Documents/m3rts$ echo $MYLABEL
blabla
naquoc17@ubuntuvm:~/Documents/m3rts$
```

- **Whoami:** Display the name of the current user
- **Groups:** Shows all groups to which the current user belongs
- **Pwd:** “Print working directory” – prints the path of the current working directory (starting from the root)
- **Date:** Displays the system date and time
- **Echo Hallo:** Displays the string “Hallo”
- **Echo \$PATH:** Displays env PATH (Enviromental Variable), which lists directories that the shell searches for executable files (command)
- **Export MYLABEL=blabla:** Sets the env “MYLABEL” to the string “blabla”. This variable will be available as long as the terminal session lasts
- **Echo \$MYLABEL:** Displays the value of the “MYLABEL” env

- **Ps -ef:** Displays a list of all the current running processes on the system, showing detailed information such as user ID, process ID, parent process ID, ...

```

ubuntuvm [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
root 417 2 0 14:28 ? 00:00:00 [kmpath_rdacd]
root 418 2 0 14:28 ? 00:00:00 [kmpathd]
root 419 2 0 14:28 ? 00:00:00 [kmpath_handlerd]
root 420 1 0 14:28 ? 00:00:00 /sbin/multipathd -d -s
root 425 1 0 14:28 ? 00:00:00 /lib/systemd/systemd-udevd
root 579 2 0 14:28 ? 00:00:00 [jbd2/sda2-8]
root 580 2 0 14:28 ? 00:00:00 [ext4-rsv-conver]
systemd+ 595 1 0 14:29 ? 00:00:00 /lib/systemd/systemd-timesyncd
systemd+ 638 1 0 14:29 ? 00:00:00 /lib/systemd/systemd-networkd
systemd+ 640 1 0 14:29 ? 00:00:00 /lib/systemd/systemd-resolved
root 651 1 0 14:29 ? 00:00:00 /usr/sbin/cron -f -P
message+ 652 1 0 14:29 ? 00:00:00 @dbus-daemon --system --address=systemd: --nofor
root 658 1 0 14:29 ? 00:00:00 /usr/sbin/irqbalance --foreground
root 659 1 0 14:29 ? 00:00:00 /usr/bin/python3 /usr/bin/networkd-dispatcher --
root 660 1 0 14:29 ? 00:00:00 /usr/libexec/polkitd --no-debug
syslog 666 1 0 14:29 ? 00:00:00 /usr/sbin/rsyslogd -n -iNONE
root 670 1 0 14:29 ? 00:00:00 /lib/systemd/systemd-logind
root 672 1 0 14:29 ? 00:00:00 /usr/libexec/udisks2/udisksd
root 694 1 0 14:29 ? 00:00:00 /usr/bin/python3 /usr/share/unattended-upgrades/
root 712 1 0 14:29 ? 00:00:00 /usr/sbin/ModemManager
root 715 1 0 14:29 ? 00:00:00 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 s
root 881 1 0 14:33 tty1 00:00:00 /bin/login -p --
root 1004 1 0 14:34 ? 00:00:05 /usr/lib/snapd/snapd
naquoc17 1257 1 0 14:34 ? 00:00:00 /lib/systemd/systemd --user
naquoc17 1258 1257 0 14:34 ? 00:00:00 (sd-pam)
naquoc17 1267 881 0 14:34 tty1 00:00:00 -bash
root 1505 2 0 14:35 ? 00:00:00 [kworker/0:67-events]
root 1711 2 0 14:35 ? 00:00:00 [kworker/u4:3-events_power_efficient]
root 1938 2 0 14:44 ? 00:00:00 [kworker/1:2-events]
root 1990 1 0 14:56 ? 00:00:01 /usr/libexec/fwupd/fwupd
root 1995 1 0 14:56 ? 00:00:00 /usr/libexec/upowerd
root 2019 1 0 14:56 ? 00:00:00 gpg-agent --homedir /var/lib/fwupd/gnupg --use-s
root 2031 2 0 14:56 ? 00:00:00 [kworker/0:0-events]
root 2051 2 0 15:05 ? 00:00:00 [kworker/u4:1-events_power_efficient]
root 2057 2 0 15:10 ? 00:00:00 [kworker/u4:0-events_power_efficient]
naquoc17 2058 1267 0 15:13 tty1 00:00:00 ps -ef
naquoc17@ubuntuvm: ~/Documents/m3rts$ _

```

- **Ps -ef > ps.out:** Runs ps -ef and redirects its output to a file named “ps.out”
- **Cat ps.out:** Displays file ps.out
- **More ps.out:** Displays the content of file “ps.out” on the screen and can scroll down to watch more but not up
- **Less ps.out:** Similar to “more” command, but allows for backward and forward movement in the file “ps.out”
- **Head ps.out:** Displays the first 10 lines of the file “ps.out”