

NAME:VISHWAS M

SRN: PES2UG20CS390

SEC: F

SUB : OPERATING SYSTEM LABORATORY

WEEK: 2

Linux commands and

Fork():

SCREENSHOTS OF THE COMMANDS EXECUTED:

```
vishwas@pop-os: ~  
vishwas@pop-os:~$ ps  
  PID TTY          TIME CMD  
 2765 pts/0    00:00:00 bash  
 2780 pts/0    00:00:00 ps  
vishwas@pop-os:~$ pwd  
/home/vishwas  
vishwas@pop-os:~$ cd.  
Command 'cd.' not found, did you mean:  
  command 'cdo' from deb cdo (2.0.0~rc2-1)  
  command 'cdw' from deb cdw (0.8.1-1build5)  
  command 'cd5' from deb cd5 (0.1-4)  
  command 'cde' from deb cde (0.1+git9-g551e54d-1.2)  
  command 'cdi' from deb cdo (2.0.0~rc2-1)  
  command 'cdp' from deb irpas (0.10-8ubuntu1)  
  command 'cdb' from deb tinycdb (0.78build1)  
Try: sudo apt install <deb name>  
vishwas@pop-os:~$ cd ..  
vishwas@pop-os:/home$ cd \  
> cd home  
bash: cd: too many arguments  
vishwas@pop-os:/home$ cd .  
vishwas@pop-os:/home$ cd vishwas/  
vishwas@pop-os:~$ cd .  
vishwas@pop-os:~$ pwd
```

```
  command 'cdi' from deb cdo (2.0.0~rc2-1)  
  command 'cdp' from deb irpas (0.10-8ubuntu1)  
  command 'cdb' from deb tinycdb (0.78build1)  
Try: sudo apt install <deb name>  
vishwas@pop-os:~$ cd ..  
vishwas@pop-os:/home$ cd \  
> cd home  
bash: cd: too many arguments  
vishwas@pop-os:/home$ cd .  
vishwas@pop-os:/home$ cd vishwas/  
vishwas@pop-os:~$ cd .  
vishwas@pop-os:~$ pwd  
/home/vishwas  
vishwas@pop-os:~$ ps -a  
  PID TTY          TIME CMD  
 1368 tty2    00:00:03 Xorg  
 1387 tty2    00:00:00 gnome-session-b  
 3360 pts/0    00:00:00 ps  
vishwas@pop-os:~$ w  
 13:51:46 up 9 min,  1 user,  load average: 0.01, 0.96, 0.90  
USER      TTY      FROM              LOGIN@   IDLE   JCPU   PCPU   WHAT  
vishwas   :1       :1                13:44    ?xdm?  2:28   0.01s /usr/libexec/gd  
vishwas@pop-os:~$ du  
4          ./gnupg/private-keys-v1.d
```

```
assignments
vishwas@pop-os: ~
vishwas :1      :1      13:44  ?xdm?  2:28  0.01s /usr/libexec/gd
vishwas@pop-os:~$ du
4      ./gnupg/private-keys-v1.d
8      ./gnupg
72     ./pki/nssdb
76     ./pki
4      ./Public
4      ./mozilla/extensions
1360   ./mozilla/firefox/sjxywo4t.default-release/gmp-gmpopenh264/1.8.1.1
1364   ./mozilla/firefox/sjxywo4t.default-release/gmp-gmpopenh264
16     ./mozilla/firefox/sjxywo4t.default-release/sessionstore-backups
4      ./mozilla/firefox/sjxywo4t.default-release/storage/permanent/chrome/idb
/2823318777ntouromlalnodry--naod.files
4      ./mozilla/firefox/sjxywo4t.default-release/storage/permanent/chrome/idb
/1657114595AmcateirvtiSty.files
4      ./mozilla/firefox/sjxywo4t.default-release/storage/permanent/chrome/idb
/1451318868ntouromlalnodry--epcr.files
4      ./mozilla/firefox/sjxywo4t.default-release/storage/permanent/chrome/idb
/2918063365piupsah.files
4      ./mozilla/firefox/sjxywo4t.default-release/storage/permanent/chrome/idb
/3870112724rsegmnoittet-es.files
4      ./mozilla/firefox/sjxywo4t.default-release/storage/permanent/chrome/idb
/3561288849sdhlie.files
14264  ./mozilla/firefox/sjxywo4t.default-release/storage/permanent/chrome/idb
```

```

vishwas@pop-os: ~
192    ./local/share/Trash
4      ./local/share/ibus-table
4      ./local/share/pop-transition
4      ./local/share/gnome-settings-daemon
12     ./local/share/gnome-shell
4      ./local/share/evolution/memos/trash
8      ./local/share/evolution/memos
8      ./local/share/evolution/calendar/system
4      ./local/share/evolution/calendar/trash
16     ./local/share/evolution/calendar
4      ./local/share/evolution/mail/trash
8      ./local/share/evolution/mail
4      ./local/share/evolution/addressbook/system/photos
92     ./local/share/evolution/addressbook/system
4      ./local/share/evolution/addressbook/trash
100    ./local/share/evolution/addressbook
8      ./local/share/evolution/tasks/system
4      ./local/share/evolution/tasks/trash
16     ./local/share/evolution/tasks
152    ./local/share/evolution
133344 ./local/share
133348 ./local
162336 .
vishwas@pop-os:~$
```

```
vishwas@pop-os: /dev
vishwas@pop-os:~$ echo hello
hello
vishwas@pop-os:~$ ls
Desktop    Downloads  Pictures  Templates  webserver.pcap
Documents  Music      Public    Videos
vishwas@pop-os:~$ cd /dev
vishwas@pop-os:/dev$ ls
autofs      loop4      tty0       tty4       ttyS11     vboxguest
block       loop5      tty1       tty40      ttyS12     vboxuser
bsg         loop6      tty10      tty41      ttyS13     vcs
btrfs-control loop7      tty11      tty42      ttyS14     vcs1
bus         loop-control tty12      tty43      ttyS15     vcs2
cdrom       mapper     tty13      tty44      ttyS16     vcs3
char        mcelog     tty14      tty45      ttyS17     vcs4
console     mem        tty15      tty46      ttyS18     vcs5
core        mqueue     tty16      tty47      ttyS19     vcs6
cpu         net        tty17      tty48      ttyS2       vcsa
cpu_dma_latency null      tty18      tty49      ttyS20     vcsa1
cuse        nvram      tty19      tty5       ttyS21     vcsa2
disk        port       tty2       tty50      ttyS22     vcsa3
dm-0        ppp        tty20      tty51      ttyS23     vcsa4
dma_heap    psaux      tty21      tty52      ttyS24     vcsa5
dri         ptmx       tty22      tty53      ttyS25     vcsa6
dvd         pts        tty23      tty54      ttyS26     vcsu
```

```
vishwas@pop-os: /dev
cuse        nvram      tty19      tty5       ttyS21     vcsa2
disk        port       tty2       tty50      ttyS22     vcsa3
dm-0        ppp        tty20      tty51      ttyS23     vcsa4
dma_heap    psaux      tty21      tty52      ttyS24     vcsa5
dri         ptmx       tty22      tty53      ttyS25     vcsa6
dvd         pts        tty23      tty54      ttyS26     vcsu
ecryptfs    random     tty24      tty55      ttyS27     vcsu1
fb0         rfkill     tty25      tty56      ttyS28     vcsu2
fd          rtc        tty26      tty57      ttyS29     vcsu3
full        rtc0       tty27      tty58      ttyS3       vcsu4
fuse        sda        tty28      tty59      ttyS30     vcsu5
hpet        sda1       tty29      tty6       ttyS31     vcsu6
hugepages   sda2       tty3       tty60      ttyS4       vfio
hwrng       sg0        tty30      tty61      ttyS5       vga_arbiter
i2c-0       sg1        tty31      tty62      ttyS6       vhci
initctl     shm        tty32      tty63      ttyS7       vhost-net
input       snapshot   tty33      tty7       ttyS8       vhost-vsock
kmsg        snd        tty34      tty8       ttyS9       zero
log         sr0        tty35      tty9       udmabuf
loop0       stderr     tty36      ttyprintk uhid
loop1       stdin      tty37      ttyS0      uinput
loop2       stdout     tty38      ttyS1      urandom
loop3       tty        tty39      ttyS10     userio
vishwas@pop-os:/dev$
```

```
vishwas@pop-os: /etc
vishwas@pop-os:/dev$ cd ..
vishwas@pop-os:/$ cd /etc
vishwas@pop-os:/etc$ ls
acpi                               hostname                          profile
adduser.conf                      hosts                             profile.d
alsa                              hosts.allow                      protocols
alternatives                     hosts.deny                       pulse
apg.conf                          ifplugd                          python3
apm                               init.d                           python3.9
apparmor                         initramfs-tools                 rc0.d
apparmor.d                       inputrc                          rc1.d
appport                          insserv.conf.d                  rc2.d
appstream.conf                   io.elementary.appcenter         rc3.d
apt                               ipp-usb                         rc4.d
avahi                            iproute2                        rc5.d
bash.bashrc                      issue                            rc6.d
bash_completion                  issue.diverted                  rcS.d
bash_completion.d                issue.net                       request-key.conf
bindresvport.blacklist           issue.net.diverted              request-key.d
binfmt.d                        kernel                           resolv.conf
bluetooth                       kernelstub                      resolvconf
brlapi.key                       ld.so.cache                     rmt
brltty                           ld.so.conf                      rpc
brltty.conf                      ld.so.conf.d                   rsyslog.conf
```

```
vishwas@pop-os: /etc
firewalld                         NetworkManager                  udev
fonts                             networks                       udisks2
fstab                             newt                            ufw
fuse.conf                        nsswitch.conf                  update-manager
fwupd                            openvpn                         update-motd.d
gai.conf                         opt                             UPower
gdm3                             os-release                     usb_modeswitch.conf
geoclue                          os-release.diverted            usb_modeswitch.d
ghostscript                      PackageKit                     vconsole.conf
glvnd                            pam.conf                       vdpau_wrapper.cfg
gnome                            pam.d                          vim
gnome-app-install               papersize                      vtrgb
groff                            passwd                         vulkan
group                            passwd-                        wgetrc
group-                           pcmcia                        wireshark
grub.d                           perl                           wpa_supplicant
gshadow                          pki                            X11
gshadow-                         pm                             xattr.conf
gss                              pnm2ppa.conf                  xdg
gtk-2.0                          polkit-1                       xml
gtk-3.0                          pop-os                         zsh_command_not_found
hdparm.conf                      ppp
host.conf                        prime-discrete
```

vishwas@pop-os:/etc\$

```
vishwas@pop-os: /lib
vishwas@pop-os:/etc$ cd ..
vishwas@pop-os:/$ cd /lib
vishwas@pop-os:/lib$ ls
accountsservice      libsupp.a
apg                  linux
apparmor             linux-sound-base
apt                  locale
aspell               lp_solve
bfd-plugins          lsb
binfmt.d             man-db
bluetooth            mime
brltty               modprobe.d
cargo                modules
cnf-update-db         modules-load.d
command-not-found     mozilla
compat-ld             netplan
console-setup         networkd-dispatcher
cpp                   NetworkManager
crda                  nvidia
cryptsetup            openssh
cups                  openvpn
dbus-1.0              os-release
dkms                  os-release.diverted
dnsmasq               pam.d
```

```
vishwas@pop-os: /lib
grub-legacy          software-properties
gvfs                  speech-dispatcher-modules
hdparm                ssl
hidpi-daemon          sudo
ibus                  sysctl.d
ifupdown              systemd
init                  sysusers.d
initramfs-tools       tc
ispell                terminfo
kernel                tmpfiles.d
klibc                 ubiquity
klibc-m5AXc2BJ8uyu2KqWaH9fAymvIuw.so ubuntu-advantage
libfirmware_manager.so udev
libfirmware_manager.so.0 udisks2
libpop_desktop_widget.so ufw
libpop_desktop_widget.so.0 unity-settings-daemon-1.0
libpop_theme_switcher.so usrmerge
libpop_theme_switcher.so.0 valgrind
libpop_upgrade_gtk.so  X11
libpop_upgrade_gtk.so.1 x86_64-linux-gnu
libreoffice           xorg
libs76_hidpi_widget.so xserver-xorg-video-intel
libs76_hidpi_widget.so.0
vishwas@pop-os:/lib$
```

```
vishwas@pop-os: /sbin

vishwas@pop-os:/lib$ cd ..
vishwas@pop-os:/$ cd /home
vishwas@pop-os:/home$ ls
vishwas
vishwas@pop-os:/home$ cd ..
vishwas@pop-os:/$ cd /root
bash: cd: /root: Permission denied
vishwas@pop-os:/$ su
Password:

^C
vishwas@pop-os:/$ pwd
/
vishwas@pop-os:/$ cd /sbin
vishwas@pop-os:/sbin$ ls
aa-remove-unknown      grub-install           plymouthd
aa-status               grub-macbless          poweroff
aa-teardown             grub-mkconfig          pppd
accessdb                grub-mkdevicemap       pppdump
acpid                   grub-probe             pppoe-discovery
addgnupghome            grub-reboot            pppstats
addgroup                grub-set-default       pptp
add-shell               halt                   pptpsetup
adduser                 hdparm                 pvchange
```

```
vishwas@pop-os: /sbin

fsfreeze                nologin                vgimportclone
fstab-decode            ntfsclone              vgmerge
fstrim                  ntfsclp                vgmknodes
gdisk                   ntfslabel              vgreduce
gdm3                     ntfsresize             vgrename
genccode                ntfsundelete           vgs
gencmn                  on_ac_power            vgscan
genl                     openvpn                vgsplit
gennorm2                ownership              vigr
gensprep                pam-auth-update        vipw
getcap                  pam_extrausers_chkpwd  visudo
getpcaps                pam_extrausers_update  vpddecode
getty                   pam_getenv              wipefs
getweb                  pam_tally               wpa_action
gnome-menus-blacklist  pam_tally2             wpa_cli
groupadd                 pam_timestamp_check    wpa_supplcant
groupdel                 paperconfig            xtables-legacy-multi
groupmems                parted                 xtables-monitor
groupmod                 partprobe              xtables-nft-multi
grpck                    pccardctl              zic
grpconv                  pdata_tools            zramctl
grpunconv                pivot_root
grub-bios-setup          plipconfig
```

Fork():


The output of the program is executed in the order of 2^n . Here 'n' is the number of times the fork() command is used inside the main function. There are more commands just like fork() such as exit(), terminate(), wait(), getpid() , read(), write() and many more. These commands are used to alter the process state in the operation system.

The output of the program when fork() is used one time will be two times.







The output of the program when fork() Is used two time will be four times.

The output of the program when fork() Is used three times will be eight times.



when fork() used 2 time:

Programiz
C Online Compiler

Learn C App



main.c



Run


```
1 // Online C compiler to run C program online
2 #include <stdio.h>
3 #include<sys/types.h> //posix numerous data types enable you to get pid,ppid,cid
4 #include<unistd.h> //fork(),wait(),getpid(),exit()
5 int main() {
6     fork();
7     printf("welcome to OS lab-2\n");
8     return 0;
9 }
```

Output






Clear

```
/tmp/pYelVpVU8nm.o
welcome to OS lab-2
welcome to OS lab-2
```



when fork() is used 2 times:

 Programiz
C Online Compiler

Learn C App

     JS

main.c

  Run

Output

Clear

```
1 // Online C compiler to run C program online
2 #include <stdio.h>
3 #include<sys/types.h> //posix numerous data types enable you to get pid,ppid,cid
4 #include<unistd.h> //fork(),wait(),getpid(),exit()
5 int main() {
6     fork();
7     fork();
8     printf("welcome to OS lab-2\n");
9     return 0;
10 }
```

/tmp/pYeVpVU8nm.o
welcome to OS lab-2
welcome to OS lab-2
welcome to OS lab-2
welcome to OS lab-2

when fork() is used 3 times:

[illegible]

