



D Y PATIL INTERNATIONAL UNIVERSITY
SYSTEMS SOFTWARE
SEMESTER-IV
LAB SHEET - 2

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- **Aim:** Commands related to inode, I/O redirection and piping, ps, kill, jobs.
- **Software Used:** Operating System: Linux
- **Source Code/experiment description:**

I. **inode:** Example: Deleting a file by its inode number

```
ubuntu@ubuntu2310: ~/Desktop
GNU nano 7.2                               inode.sh
#!/usr/bin/bash
ARGCOUNT=1
E_WRONGARGS=70
E_FILE_NOT_EXIST=71
E_CHANGED_MIND=72
if [ $# -ne "$ARGCOUNT" ]
then
echo "Usage: `basename $0` filename"
exit $E_WRONGARGS
fi
if [ ! -e "$1" ]
then
echo "File \"$1\" does not exist."
exit $E_FILE_NOT_EXIST
fi
inum=`ls -li | grep "$1" | awk '{print $1}'`
echo; echo -n "Are you absolutely sure you want to delete \"$1\" (y/n)? "
read answer
case "$answer" in
[nN]) echo "Changed your mind, huh?"
exit $E_CHANGED_MIND
;;
*) echo "Deleting file \"$1\".";;
esac
find . -inum $inum -exec rm {} \;
echo "File \"$1\" deleted!"
exit 0
```

```
ubuntu@ubuntu2310: ~/Desktop
ubuntu@ubuntu2310:~/Desktop$ nano assign2.sh
ubuntu@ubuntu2310:~/Desktop$ ls
inode.sh
ubuntu@ubuntu2310:~/Desktop$ nano inode.sh
ubuntu@ubuntu2310:~/Desktop$ touch temp.txt
ubuntu@ubuntu2310:~/Desktop$ ls
inode.sh  temp.txt
ubuntu@ubuntu2310:~/Desktop$ ./inode.sh temp.txt

Are you absolutely sure you want to delete "temp.txt" (y/n)? y
Deleting file "temp.txt".
File "temp.txt" deleted!
ubuntu@ubuntu2310:~/Desktop$ ls
inode.sh
ubuntu@ubuntu2310:~/Desktop$
```

II. I/O redirection: Example1: Redirecting stdin using exec

```
GNU nano 7.2      io-redirection.sh
#!/usr/bin/bash
# Redirecting stdin using 'exec'.
exec 6<&0 # Link file descriptor #6 with stdin.
# Saves stdin.
exec< data-file.txt # stdin replaced by file "data-file"
read a1 # Reads first line of file "data-file".
read a2 # Reads second line of file "data-file."
echo
echo "Following lines read from file."
echo " "
echo $a1
echo $a2
echo; echo; echo
exec 0<&6 6<&-
# Now restore stdin from fd #6, where it had been saved,
#+ and close fd #6 ( 6<&- ) to free it for other processes to use.
#
# <&6 6<&- also works.
echo -n "Enter data "
read b1 # Now "read" functions as expected, reading from normal stdin.
echo "Input read from stdin."
echo " "
echo "b1 = $b1"
echo
exit 0
```

```
ubuntu@ubuntu2310: ~  
ubuntu@ubuntu2310:~$ ./io-redirectation.sh  
  
Following lines read from file.  
  
hello  
how are you  
  
Enter data new  
Input read from stdin.  
  
b1 = new  
ubuntu@ubuntu2310:~$
```

Example2: Redirecting stdout using exec

```
GNU nano 7.2 io-redirectation.sh  
#!/bin/bash  
# reassign-stdout.sh  
LOGFILE=logfile.txt  
exec 6>&1 # Link file descriptor #6 with stdout.  
# Saves stdout.  
exec> $LOGFILE # stdout replaced with file "logfile.txt".  
# #  
# All output from commands in this block sent to file $LOGFILE.  
echo -n "Logfile: "  
date  
echo " "  
echo  
echo "Output of \"ls -al\" command"  
echo  
ls -al  
echo; echo  
echo "Output of \"df\" command"  
echo  
df  
# #  
exec 1>&6 6>&- # Restore stdout and close file descriptor #6.  
echo  
echo "== stdout now restored to default == "  
echo  
ls -al  
echo  
exit 0  
  
^G Help      ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location  
^X Exit      ^R Read File  ^\ Replace    ^U Paste      ^J Justify    ^_ Go To Line
```

```

ubuntu@ubuntu2310:~$ ./io-redirection.sh

== stdout now restored to default ==

total 116
drwxr-x--- 16 ubuntu ubuntu 4096 Feb 28 01:28 .
drwxr-xr-x  3 root   root   4096 Dec  8 03:39 ..
-rw-----  1 ubuntu ubuntu  585 Feb 28 01:01 .bash_history
-rw-r--r--  1 ubuntu ubuntu  220 Jan  7 2023 .bash_logout
-rw-r--r--  1 ubuntu ubuntu  3771 Jan  7 2023 .bashrc
drwx----- 13 ubuntu ubuntu 4096 Feb 28 01:00 .cache
drwx----- 13 ubuntu ubuntu 4096 Feb 28 00:13 .config
-rw-rw-r--  1 ubuntu ubuntu   44 Feb 28 01:16 data-file.txt
drwxr-xr-x  2 ubuntu ubuntu 4096 Feb 28 01:13 Desktop
drwxr-xr-x  2 ubuntu ubuntu 4096 Dec  8 03:40 Documents
drwxr-xr-x  2 ubuntu ubuntu 4096 Feb 28 00:19 Downloads
drwx-----  2 ubuntu ubuntu 4096 Dec 10 23:15 .gnupg
-rwxrwxr-x  1 ubuntu ubuntu  522 Feb 28 01:28 io-redirection.sh
drwx-----  4 ubuntu ubuntu 4096 Dec  8 03:40 .local
-rw-rw-r--  1 ubuntu ubuntu 2374 Feb 28 01:28 logfile.txt
drwxr-xr-x  2 ubuntu ubuntu 4096 Dec  8 03:40 Music
drwxr-xr-x  3 ubuntu ubuntu 4096 Feb 28 00:59 Pictures
-rwxrwxr-x  1 ubuntu ubuntu  575 Feb 28 01:05 piping.sh
-rw-r--r--  1 ubuntu ubuntu  807 Jan  7 2023 .profile
drwxr-xr-x  2 ubuntu ubuntu 4096 Dec  8 03:40 Public
drwx-----  4 ubuntu ubuntu 4096 Feb 28 00:14 snap
drwx-----  2 ubuntu ubuntu 4096 Dec  8 03:39 .ssh
-rw-r--r--  1 ubuntu ubuntu   0 Dec  8 05:55 .sudo_as_admin_successful
drwxr-xr-x  2 ubuntu ubuntu 4096 Dec  8 03:40 Templates
-rw-r-----  1 ubuntu ubuntu   5 Feb 28 00:13 .vboxclient-clipboard.pid
-rw-r-----  1 ubuntu ubuntu   5 Feb 28 00:13 .vboxclient-draganddrop.pid
-rw-r-----  1 ubuntu ubuntu   5 Feb 28 00:13 .vboxclient-seamless.pid
-rw-r-----  1 ubuntu ubuntu   5 Feb 28 00:13 .vboxclient-vmtoolsd-session-tty2.pid
drwxr-xr-x  2 ubuntu ubuntu 4096 Dec  8 03:40 Videos
-rw-----  1 ubuntu ubuntu 1513 Feb 28 01:13 .viminfo

```

```

ubuntu@ubuntu2310:~$ cat logfile.txt
Logfile: Wed Feb 28 01:28:27 AM EST 2024

Output of "ls -al" command

total 116
drwxr-x--- 16 ubuntu ubuntu 4096 Feb 28 01:28 .
drwxr-xr-x  3 root   root   4096 Dec  8 03:39 ..
-rw-----  1 ubuntu ubuntu  585 Feb 28 01:01 .bash_history
-rw-r--r--  1 ubuntu ubuntu  220 Jan  7 2023 .bash_logout
-rw-r--r--  1 ubuntu ubuntu  3771 Jan  7 2023 .bashrc
drwx----- 13 ubuntu ubuntu 4096 Feb 28 01:00 .cache
drwx----- 13 ubuntu ubuntu 4096 Feb 28 00:13 .config
-rw-rw-r--  1 ubuntu ubuntu   44 Feb 28 01:16 data-file.txt
drwxr-xr-x  2 ubuntu ubuntu 4096 Feb 28 01:13 Desktop
drwxr-xr-x  2 ubuntu ubuntu 4096 Dec  8 03:40 Documents
drwxr-xr-x  2 ubuntu ubuntu 4096 Feb 28 00:19 Downloads
drwx-----  2 ubuntu ubuntu 4096 Dec 10 23:15 .gnupg
-rwxrwxr-x  1 ubuntu ubuntu  522 Feb 28 01:28 io-redirection.sh
drwx-----  4 ubuntu ubuntu 4096 Dec  8 03:40 .local
-rw-rw-r--  1 ubuntu ubuntu  72 Feb 28 01:28 logfile.txt
drwxr-xr-x  2 ubuntu ubuntu 4096 Dec  8 03:40 Music
drwxr-xr-x  3 ubuntu ubuntu 4096 Feb 28 00:59 Pictures
-rwxrwxr-x  1 ubuntu ubuntu  575 Feb 28 01:05 piping.sh
-rw-r--r--  1 ubuntu ubuntu  807 Jan  7 2023 .profile
drwxr-xr-x  2 ubuntu ubuntu 4096 Dec  8 03:40 Public
drwx-----  4 ubuntu ubuntu 4096 Feb 28 00:14 snap
drwx-----  2 ubuntu ubuntu 4096 Dec  8 03:39 .ssh
-rw-r--r--  1 ubuntu ubuntu   0 Dec  8 05:55 .sudo_as_admin_successful
drwxr-xr-x  2 ubuntu ubuntu 4096 Dec  8 03:40 Templates
-rw-r-----  1 ubuntu ubuntu   5 Feb 28 00:13 .vboxclient-clipboard.pid
-rw-r-----  1 ubuntu ubuntu   5 Feb 28 00:13 .vboxclient-draganddrop.pid
-rw-r-----  1 ubuntu ubuntu   5 Feb 28 00:13 .vboxclient-seamless.pid
-rw-r-----  1 ubuntu ubuntu   5 Feb 28 00:13 .vboxclient-vmtoolsd-session-tty2.pid
drwxr-xr-x  2 ubuntu ubuntu 4096 Dec  8 03:40 Videos
-rw-----  1 ubuntu ubuntu 1513 Feb 28 01:13 .viminfo

Output of "df" command

Filesystem                                1K-blocks    Used Available Use% Mounted on
tmpfs                                       400068      1656    398412   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv        126360900 9987324 109908656   9% /
tmpfs                                       3000228      0    3000228   0% /dev/shm

```

III. **Piping:** Example: Deleting a file by its inode number

```
ubuntu@ubuntu2310: ~  
GNU nano 7.2 piping.sh  
#!/usr/bin/bash  
a=aaa  
b=bbb  
c=ccc  
echo "one two three" | read a b c  
echo  
echo "a = $a" # a = aaa  
echo "b = $b" # b = bbb  
echo "c = $c" # c = ccc  
var=`echo "one two three"`  
set -- $var  
a=$1; b=$2; c=$3  
echo "-----"  
echo "a = $a" # a = one  
echo "b = $b" # b = two  
echo "c = $c" # c = three  
a=aaa # Starting all over again.  
b=bbb  
c=ccc  
echo; echo  
echo "one two three" | ( read a b c;  
echo "Inside subshell: "; echo "a = $a"; echo "b = $b"; echo "c = $c" )  
echo "  
echo "Outside subshell: "  
echo "a = $a" # a = aaa  
echo "b = $b" # b = bbb  
echo "c = $c" # c = ccc  
echo  
exit 0
```

```
ubuntu@ubuntu2310: ~  
ubuntu@ubuntu2310:~$ nano piping.sh  
ubuntu@ubuntu2310:~$ nano piping.sh  
ubuntu@ubuntu2310:~$ chmod +x piping.sh  
ubuntu@ubuntu2310:~$ ./piping.sh  
  
a = aaa  
b = bbb  
c = ccc  
-----  
a = one  
b = two  
c = three  
  
Inside subshell:  
a = one  
b = two  
c = three  
  
Outside subshell:  
a = aaa  
b = bbb  
c = ccc  
  
ubuntu@ubuntu2310:~$
```


IV. **PS:** Example: Deleting a file by its inode number

```
kiran@KLinux: ~/Desktop/Assignment
kiran@KLinux:~/Desktop/Assignment$ ps
  PID TTY          TIME CMD
  4924 pts/0    00:00:00 bash
  6737 pts/0    00:00:00 ps
kiran@KLinux:~/Desktop/Assignment$ ps ax | grep sendmail
  6743 pts/0    S+      0:00 grep --color=auto sendmail
kiran@KLinux:~/Desktop/Assignment$
```

V. **Kill:** Example: Deleting a file by its inode number

```
GNU nano 6.2 kill.sh
#!/bin/bash
kill $$ # Script kills its own process here.
echo "This line will not echo."
exit 0
```

```
kiran@KLinux: ~/Desktop/Assignment
kiran@KLinux:~/Desktop/Assignment$ ./kill.sh
Terminated
kiran@KLinux:~/Desktop/Assignment$
```

VI. **Jobs:** Example: Deleting a file by its inode number

```
kiran@KLinux: ~/Desktop/Assignment
kiran@KLinux:~/Desktop/Assignment$ sleep 100 &
[2] 8705
kiran@KLinux:~/Desktop/Assignment$ jobs
[1]-  Running                  sleep 100 &
[2]+  Running                  sleep 100 &
kiran@KLinux:~/Desktop/Assignment$ kill 8705
kiran@KLinux:~/Desktop/Assignment$ jobs
[1]-  Running                  sleep 100 &
[2]+  Terminated              sleep 100
kiran@KLinux:~/Desktop/Assignment$
```

Conclusion: In this experiment student learn various commands for shell scripting