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

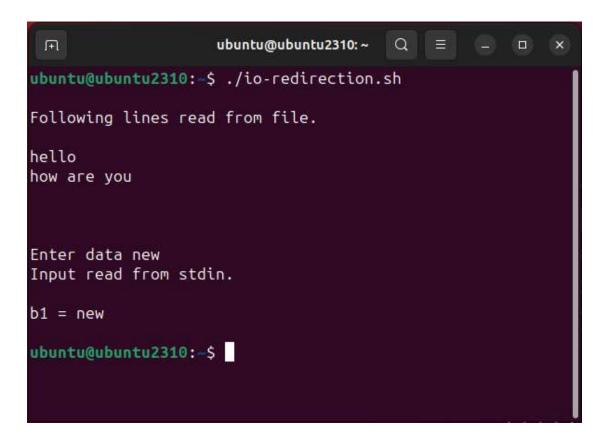II. **I/O redirection:** Example1: Redirecting stdin using exec


```bash
#!/usr/bin/bash
# Redirectingstdin 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
```

Example2: Redirecting stdout using exec

```
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-vmsvga-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-vmsvga-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% /
```

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


```bash
#!/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:~$ 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

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

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

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