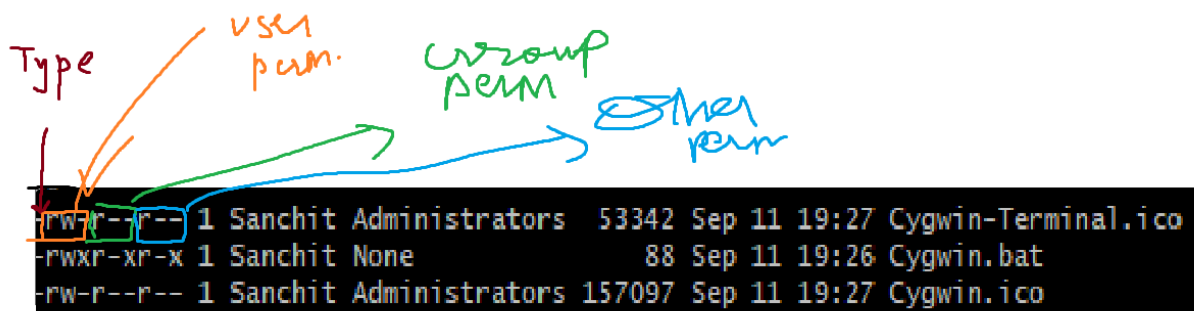


# UNIX AND SHELL PROGRAMMING

## Quiz 2

### FILE SECURITY

1) chmod



0 or - → None  
4 or r → Read  
2 or w → Write  
1 or x → Execute

u → User  
 g → group  
 o → others

Also a-> all

```

Sanchit@DESKTOP-CVD847N /test
$ ls -l
total 1
-rw-r--r-- 1 Sanchit None 17 Jan 23 20:00 file1.txt

Sanchit@DESKTOP-CVD847N /test
$ chmod 744 file1.txt

Sanchit@DESKTOP-CVD847N /test
$ ls -l
total 1
-rwxr--r-- 1 Sanchit None 17 Jan 23 20:00 file1.txt
  
```

Read + Write + execute (User)  
 Read + Write (Group)  
 ~ ~ (Others)

Permissions updated

## 2) chown

Changes file owner and group

- -R, --recursive  
operate on files and directories recursively
- -v, --verbose  
output a diagnostic for every file processed
- -H  
if a command line argument is a symbolic link to a directory, traverse it
- -L  
traverse every symbolic link to a directory encountered
- -P  
do not traverse any symbolic links (default)

## EXAMPLES

`chown root /u`

Change the owner of /u to "root".

`chown root:staff /u`

Likewise, but also change its group to "staff".

`chown -hR root /u`

Change the owner of /u and subfiles to "root".

### 3) `chgrp`

Changes group ownership

**SYNTAX :** `chgrp` [*OPTION*]... *GROUP FILE*...

Change the group of each FILE to GROUP.

OPTIONS :

**1) -c, --changes**

like verbose but report only when a change is made

**2) -R, --recursive**

operate on files and directories recursively

## EXAMPLES

`chgrp staff /u`

Change the group of /u to "staff".

**setuid:** The setuid bit simply indicates that when running the executable, it will set its permissions to that of the user who created it (owner), instead of setting it to the user who launched it.

To locate the setuid, look for an 's' instead of an 'x' in the executable bit of the file permissions.

**setgid:** When used on a file, it executes with the privileges of the group of the user who owns it instead of executing with those of the group of the user who executed it.

When the bit is set for a directory, the set of files in that directory will have the same group as the group of the parent directory, and not that of the user who created those files.

To locate the setgid, look for an 's' instead of an 'x' in the group section of the file permissions.

**sticky bit:** a bit set on directories that allows only the owner or root can delete files and subdirectories

Any user can add a file to the directory, but you can not overwrite another user's file

## HOW TO SET STICKY BIT

**Symbolic Method :**

-> `chmod +t /tmp/files`

For verifying do , `ls -ld /tmp/files`

For removing just do `-t` instead of `+t`

```
linuxopsys@linux:~$ ls -ld /tmp/files
drwxrwxr-t 2 linuxopsys linuxopsys 4096 Oct 29 22:21 /tmp/files
```

**Numeric method :**

-> `sudo chmod 1777 /tmp/code`

### 1) Loops

```
for item in [LIST]
do
```

```
[COMMANDS]
```

```
done
```

Examples :

### Loop over a string

```
for element in Hydrogen Helium Lithium Beryllium
do

    echo "Element: $element"

done
```

```
Element: Hydrogen
Element: Helium
Element: Lithium
Element: Beryllium
```

### Loop over a range

```
for i in {0..3}
do

    echo "Number: $i"

done
```

```
Number: 0
Number: 1
Number: 2
Number: 3
```

```
for i in {0..20..5}
```

```
do
```

```
    echo "Number: $i"
```

```
done
```

```
Number: 0
```

```
Number: 5
```

```
Number: 10
```

```
Number: 15
```

```
Number: 20
```

```
for ((i = 0 ; i <= 1000 ; i++)); do
```

```
    echo "Counter: $i"
```

```
done
```

```
Number: 0
```

```
Number: 5
```

```
Number: 10
```

```
Number
```

```
: 15
```

```
Number: 20
```

```
Counter: 0
```

```
Counter: 1
```

```
Counter: 2
```

```
...
```

```
Counter: 998
```

```
Counter: 999
```

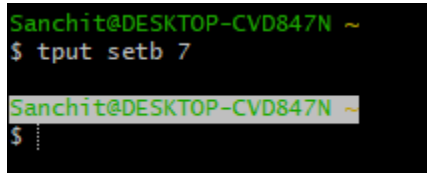
```
Counter: 1000
```

## TPUT

A command used to manipulate our terminal. With it, we can change the color of text, apply effects, and generally brighten things up. More importantly, we can use `tput` to improve the human factors of our scripts. For example, we can use color and text effects to better present information to our users.

### TPUT COLOR CAPABILITIES :

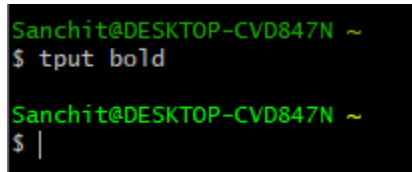
- **tput setb [1-7]** – Sets a background color

A terminal window with a black background. The prompt is 'Sanchit@DESKTOP-CVD847N ~'. The user enters '\$ tput setb 7'. The prompt and the first line of the next line are highlighted in green, demonstrating the effect of the command.

```
Sanchit@DESKTOP-CVD847N ~  
$ tput setb 7  
Sanchit@DESKTOP-CVD847N ~  
$
```

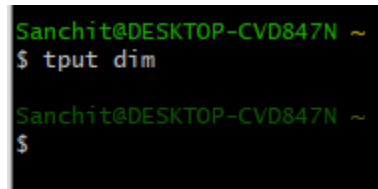
### TPUT TEXT MODE CAPABILITIES :

- **tput bold** – Set bold mode

A terminal window with a black background. The prompt is 'Sanchit@DESKTOP-CVD847N ~'. The user enters '\$ tput bold'. The prompt and the first line of the next line are in bold green text.

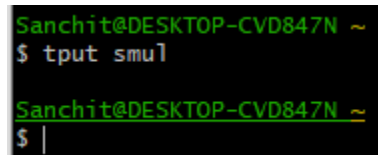
```
Sanchit@DESKTOP-CVD847N ~  
$ tput bold  
Sanchit@DESKTOP-CVD847N ~  
$ |
```

- **tput dim** – turn on half-bright mode

A terminal window with a black background. The prompt is 'Sanchit@DESKTOP-CVD847N ~'. The user enters '\$ tput dim'. The prompt and the first line of the next line are in dim green text.

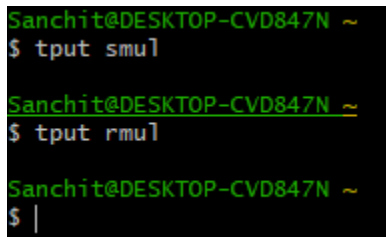
```
Sanchit@DESKTOP-CVD847N ~  
$ tput dim  
Sanchit@DESKTOP-CVD847N ~  
$
```

- **tput smul** – begin underline mode

A terminal window with a black background. The prompt is 'Sanchit@DESKTOP-CVD847N ~'. The user enters '\$ tput smul'. The prompt and the first line of the next line are underlined in green text.

```
Sanchit@DESKTOP-CVD847N ~  
$ tput smul  
Sanchit@DESKTOP-CVD847N ~  
$ |
```

- **tput rmul** – exit underline mode

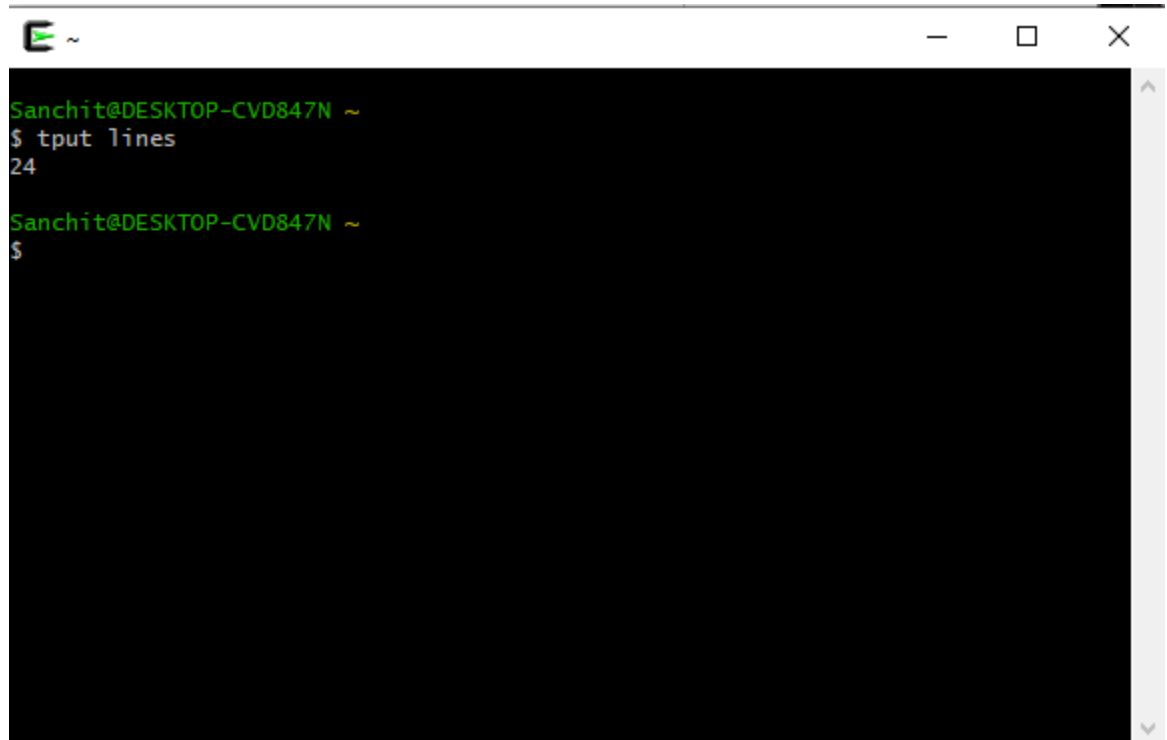
A terminal window with a black background. The prompt is 'Sanchit@DESKTOP-CVD847N ~'. The user enters '\$ tput smul' and then '\$ tput rmul'. The prompt and the first line of the next line are in green text, no longer underlined.

```
Sanchit@DESKTOP-CVD847N ~  
$ tput smul  
Sanchit@DESKTOP-CVD847N ~  
$ tput rmul  
Sanchit@DESKTOP-CVD847N ~  
$ |
```

- **tput sgr0** – Turn off all attributes

```
Sanchit@DESKTOP-CVD847N ~  
$ tput bold  
  
Sanchit@DESKTOP-CVD847N ~  
$ tput sgr0  
  
Sanchit@DESKTOP-CVD847N ~  
$ |
```

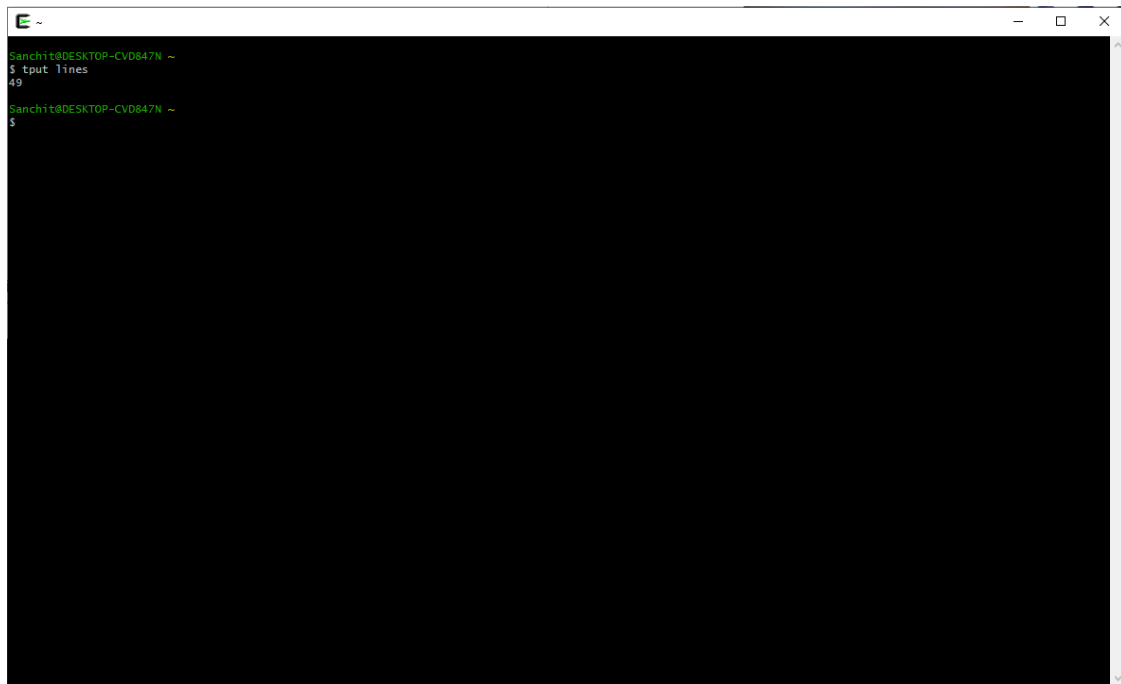
- tput lines : shows the number of lines



A terminal window with a title bar containing a green icon, a tilde symbol, and standard window controls (minimize, maximize, close). The terminal content shows the user 'Sanchit' at 'DESKTOP-CVD847N' running the command 'tput lines', which outputs '24'. The prompt '\$' is visible on the next line.

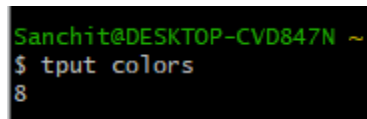
```
Sanchit@DESKTOP-CVD847N ~  
$ tput lines  
24  
  
Sanchit@DESKTOP-CVD847N ~  
$
```



A terminal window with a black background and green text. The prompt is 'Sanchit@DESKTOP-CVD847N ~'. The command '\$ tput lines' has been entered, and the output '49' is displayed on the next line.

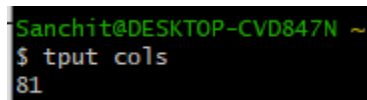
```
Sanchit@DESKTOP-CVD847N ~  
$ tput lines  
49  
Sanchit@DESKTOP-CVD847N ~  
$
```

- **tput colors** : Shows the number of colors available

A terminal window with a black background and green text. The prompt is 'Sanchit@DESKTOP-CVD847N ~'. The command '\$ tput colors' has been entered, and the output '8' is displayed on the next line.

```
Sanchit@DESKTOP-CVD847N ~  
$ tput colors  
8
```

- **tput cols** : Shows the number of columns

A terminal window with a black background and green text. The prompt is 'Sanchit@DESKTOP-CVD847N ~'. The command '\$ tput cols' has been entered, and the output '81' is displayed on the next line.

```
Sanchit@DESKTOP-CVD847N ~  
$ tput cols  
81
```

- **tput blink** : cursor starts blinking
- **tput civis** : Makes the cursor visible again
- **tput cnorm** : Deletes 10 lines below and including the one on which the cursor is positioned
- **tput dl** : Produces different kinds of output for each of the three types of terminal capabilities: string, numeric, and Boolean.