# Exercise 1 - Extracting data using 'cut' command

*The filter command cut helps us extract selected characters or fields from a line of text.*

theia@theiadocker-rajendraabro:/home/project$
echo "database" | cut -c1-4
output : data

theia@theiadocker-rajendraabro:/home/project$
echo "database" | cut -c5-8
Output:base

theia@theiadocker-rajendraabro:/home/project$
echo "database" | cut -c1,5
Output:db

**Extracting fields/columns**
**We can extract a specific column/field from a delimited text file, by mentioning**
**the delimiter using the -d option, or**
**the field number using the -f option.**
**The /etc/passwd is a ":" delimited file.**
**The command below extracts usernames (the first field) from /etc/passwd.**
**The command below extracts multiple fields 1st, 3rd, and 6th (username, userid, and home directory) from /etc/passwd.**

```
theia@theiadocker-rajendraabro:/home/project$ cut -d":" -f1 /etc/passwd
root
daemon
bin
sys
sync
games
man
lp
mail
news
uucp
proxy
www-data
backup
list
irc
gnats
nobody
_apt
systemd-network
systemd-resolve
```

messagebus
systemd-timesync
sshd
theia
cassandra
Mongodb

***The command below extracts a range of fields 3rd to 6th (userid, groupid, user description and home directory) from /etc/passwd.***

theia@theiadocker-rajendraabro:/home/project$ cut -d":" -f3-6 /etc/passwd
0:0:root:/root
1:1:daemon:/usr/sbin
2:2:bin:/bin
3:3:sys:/dev
4:65534:sync:/bin
5:60:games:/usr/games
6:12:man:/var/cache/man
7:7:lp:/var/spool/lpd
8:8:mail:/var/mail
9:9:news:/var/spool/news
10:10:uucp:/var/spool/uucp

13:13:proxy:/bin
33:33:www-data:/var/www
34:34:backup:/var/backups
38:38:Mailing List Manager:/var/list
39:39:ircd:/run/ircd
41:41:Gnats Bug-Reporting System
(admin):/var/lib/gnats
65534:65534:nobody:/nonexistent
100:65534::/nonexistent
101:102:systemd Network
Management,,,:/run/systemd
102:103:systemd Resolver,,,:/run/systemd
103:105::/nonexistent
104:106:systemd Time
Synchronization,,,:/run/systemd
105:65534::/run/sshd
1000:1000:,,,:/home/theia
106:109:Cassandra database,,,:/var/lib/cassandra
107:65534::/home/mongodb

# Exercise 2 - Transforming data using 'tr'

tr is a filter command used to translate, squeeze, and/or delete characters.

*Translate from one character set to another*

```
theia@theiadocker-rajendraabro:/home/project$
echo "Shell Scripting" | tr "[a-z]" "[A-Z]"
SHELL SCRIPTING
```

*Small to capital translate*

```
theia@theiadocker-rajendraabro:/home/project$
echo "Shell Scripting" | tr "[:lower:]" "[:upper:]"
SHELL SCRIPTING
```

Viceversa

```
theia@theiadocker-rajendraabro:/home/project$
echo "Shell Scripting" | tr  "[A-Z]" "[a-z]"
shell scripting
```

*Squeeze repeating occurrences of characters*
*The -s option replaces a sequence of a repeated characters with a single occurrence of that character.*
*The command below replaces repeat occurrences of 'space' in the output of ps command with one 'space'.*
***The ps command in Linux displays information about active processes, showing details like PID, TTY, CPU time, and command name.***
***TTY column shows the controlling terminal for each process***

```
theia@theiadocker-rajendraabro:/home/project$
ps | tr -s " "
 PID TTY TIME CMD
 232 pts/0 00:00:00 bash
 1077 pts/0 00:00:00 ps
 1078 pts/0 00:00:00 tr
```

***Delete characters***
***We can delete specified characters using the -d  option.***

The command below deletes all digits.

```
theia@theiadocker-rajendraabro:/home/project$
echo "My login pin is 5634" | tr -d "[:digit:]"
My login pin is
```