

Last.fake file structure:

```
(kali㉿kali)-[~/Documents/examen]
$ head last.fake
rares pts/0 172.30.0.3 Sun Mar 9 18:55 still logged in
rares pts/0 172.30.0.3 Sun Mar 9 18:52 - 18:53 (00:00)
rares pts/0 172.30.0.3 Sun Mar 9 18:34 - 18:35 (00:00)
rares pts/0 172.30.0.3 Sun Mar 9 18:32 - 18:33 (00:00)
rares pts/0 172.30.0.3 Sun Mar 9 18:13 - 18:14 (00:00)
sanda pts/0 172.30.120.3 Sun Mar 9 16:47 - 16:52 (00:05)
sanda pts/0 campus.cs.ubbclu Sat Mar 8 22:48 - 22:49 (00:00)
sanda pts/0 172.30.120.6 Sat Mar 8 22:44 - 22:48 (00:03)
vlir1593 pts/0 economica.ubbclu Sat Mar 8 14:46 - 14:49 (00:02)
florin pts/0 172.30.4.5 Sat Mar 8 13:26 - 13:32 (00:06)
```

Passwd.fake file structure:

```
(kali㉿kali)-[~/Documents/examen]
$ head passwd.fake
aaie0001:x:1:600:Aricescu Alin:/home/scs/gr911/aaie0001:/bin/bash
abie0002:x:2:600:Aricescu Bogdan:/home/scs/gr911/abie0002:/bin/bash
acie0003:x:3:600:Aricescu Cornel:/home/scs/gr911/acie0003:/bin/bash
adie0004:x:4:600:Aricescu Dan:/home/scs/gr911/adie0004:/bin/bash
aeie0005:x:5:600:Aricescu Emil:/home/scs/gr911/aeie0005:/bin/bash
afie0006:x:6:600:Aricescu Florin:/home/scs/gr911/afie0006:/bin/bash
agie0007:x:7:600:Aricescu Gabriel:/home/scs/gr911/agie0007:/bin/bash
ahie0008:x:8:600:Aricescu Horia:/home/scs/gr911/ahie0008:/bin/bash
alie0009:x:9:600:Aricescu Laurentiu:/home/scs/gr911/alie0009:/bin/bash
amie0010:x:10:600:Aricescu Marius:/home/scs/gr911/amie0010:/bin/bash
```

Ps.fake file structure:

```
(kali㉿kali)-[~/Documents/examen]
$ head ps.fake
UID      PID  PPID  C  STIME TTY      TIME CMD
root      1    0    0  2013 ?        00:00:17 /sbin/init
root      2    0    0  2013 ?        00:00:00 [kthreadd]
root      3    2    0  2013 ?        00:00:02 [migration/0]
root      4    2    0  2013 ?        00:00:06 [ksoftirqd/0]
root      5    2    0  2013 ?        00:00:00 [migration/0]
root      6    2    0  2013 ?        00:00:06 [watchdog/0]
root      7    2    0  2013 ?        00:00:01 [migration/1]
root      8    2    0  2013 ?        00:00:00 [migration/1]
root      9    2    0  2013 ?        00:00:06 [ksoftirqd/1]
```

Problems:

#	Problem	Hints	Expected Result
1.	Find all the usernames that logged in from "economica" on a Sunday	Use "last" to find the last logins, and then search for entries containing "economica" and "Sun". Extract the first column, and using "sort" and "uniq" display only distinct usernames.	boir1417 giie1411 piir1546 vlir1593

```
(kali㉿kali)-[~/Documents/examen]
└─$ grep Sun last.fake | grep economica | awk '{print $1}' | sort | uniq
boir1417
giie1411
piir1546
vlir1593
```

2.	Find all the users that logged into the system after 11PM	Use "last" to get the data. Extract the username and the login time columns. Replace ";" with space in the result, then print only the usernames that appear on lines with the middle field 23 or greater. Use the "head" command to eliminate the last line which is not really part of the data. Use "sort" and "uniq" to show only distinct user names.	piir1546 srir1568 tnir1590 vlir1593
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```
(kali㉿kali)-[~/Documents/examen]
└─$ grep -E '23:.. \-' last.fake | awk '{print $1}' | uniq | sort
piir1546
srir1568
tnir1590
vlir1593
```

3.	Display the full names of the users having a username that starts with "m" and with a user ID divisible by 7.	Use /etc/passwd. Search for line starting with "m", then display the fifth column of the lines that have the third field divisible by 7	Malinescu Amalia-Greta Martinescu Bogdan Malinescu Bianca-Liliana Malinescu Diana-Flavia Malinescu Elena-Ioana Martinescu Laurentiu
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```
(kali㉿kali)-[~/Documents/examen]
└─$ grep -E '^m' passwd.fake | awk -F ':' '$3 % 7 == 0 {print $5}'
Malinescu Amalia-Greta
Martinescu Bogdan
Malinescu Bianca-Liliana
Malinescu Diana-Flavia
Malinescu Elena-Ioana
Martinescu Laurentiu
```

4.	Display all the distinct TTYs used by user root.	Use command "ps -eF" to get the data. Search for lines starting with "root" and display their sixth field. Use "sort" and "uniq" to display the distinct value	? pts/2 tty1 tty2 tty3 tty4 tty5 tty6
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```
(kali@kali)-[~/Documents/examen]
$ grep '^root' ps.fake | awk '{print $6}' | sort | uniq
?
pts/2
tty1
tty2
tty3
tty4
tty5
tty6
```

5.	Find the full names of all the users whose username ends in 88	Use /etc/passwd. Search for the required entries, then extract the fifth column only.	Lobodescu Amalia-Monica Leopardescu Dan
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```
(kali@kali)-[~/Documents/examen]
$ grep -E '^.*88:' passwd.fake | cut -d ':' -f5
Lobodescu Amalia-Monica
Leopardescu Dan
```

6.	Find all users whose user ID has three digits and starts with 23	Use /etc/passwd. Search for the required entries and then display the fifth column only. Rely on the structure of the file and possibly also on the length of the usernames	Malinescu Elena-Greta Malinescu Elena-Ioana Malinescu Elena-Liliana Malinescu Elena-Monica
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```
(kali@kali)-[~/Documents/examen]
$ awk -F ':' '$3 ~ /23./ {print $5}' passwd.fake # column 3 contains that regex expression between /regex/
Malinescu Elena-Greta
Malinescu Elena-Ioana
Malinescu Elena-Liliana
Malinescu Elena-Monica
```

7.	Find all usernames starting with "t" that logged on "pts/9"	Use the command "last". Search by the first and second fields, then extract just the first. Use the commands "sort" and "uniq" to display only distinct usernames	tmir1388 toie1637 toir1583
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```
(kali㉿kali)-[~/Documents/examen]
$ awk '$2 ~ /pts\/9/ && $1 ~ /t.*/ {print $1}' last.fake | sort | uniq
tmir1388
toie1637
toir1583
```

8.	Find all the distinct usernames starting with "r" that are currently running programs, and display them duplicating every vowel	Use the command "ps -ef". Search for lines starting with "r" then use "sort" and "uniq" to remove duplicates. Search/replace the result duplicating every vowel	raarees rooooot rpc rpcuuseer rtkiit
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```
(kali㉿kali)-[~/Documents/examen]
$ grep -E '^r' ps.fake | awk '{print $1}' | sort | uniq | sed -E 's/([aeiouAEIOU])/&\1/g'
raarees
rooooot
rpc
rpcuuseer
rtkiit

(kali㉿kali)-[~/Documents/examen]
$ # in regex, trebuie puse paranteze, ca sa putem accesa elementul dupa, '6' inseamna toate grupurile ce le-a matchuit, iar \1 inseamna primul caracter (si in cazul nostru singurul din grup)
```

9.	Display all the distinct lines left in /etc/passwd after deleting all letter and digits and spaces.	Search replace the required characters. User "sort" and "uniq" to display to distinct lines.	::::-:////:// ::::-:////://
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```
(kali㉿kali)-[~/Documents/examen]
$ sed -E 's/[^\\:\\-\\\/]//g' passwd.fake | sort | uniq
::::-:////://
```

10.	Display all the distinct lines left in /etc/passwd after deleting all characters except "r".	Search replace the required characters. User "sort" and "uniq" to display to distinct lines.	r rr rrr rrrr
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```
(kali㉿kali)-[~/Documents/examen]
$ sed -E 's/[^r]//g' passwd.fake | sort | uniq
r
rr
rrr
rrrr
```

11.	Calculate the average of the PIDs of the processes currently running in the system.	Use command "ps -eF". Calculate the sum of the second field values and divide by the number of records	8373.95
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```
(kali㉿kali)-[~/Documents/examen]
$ sed '1d' ps.fake | awk '$2 ~ /^[0-9]*/ {sum += $2} END { if (NR > 0) print sum / (NR + 1) }'
8373.95
```