Übungsprotokoll

SYTB – Systemtechnik Betriebssysteme

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Übungsbezeichnung:

Debian Server

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2.1 Debian aufsetzen

Wichtige Fakten:

- Debian Version: 11
- RAM 4GB
- Festplattenspeicher: 16GB (dynamisch)
- deutsche Tastatur
- 200MB SWAP

3 Übungsdurchführung

3.2 Erweiterungspakete installieren

Installing Guest Additions on Debian

Follow these steps to install the Guest Additions on your Debian virtual machine:

1. Login as root;
2. Update your APT database with *apt-get update*;
3. Install the latest security updates with *apt-get upgrade*;
4. Install required packages with *apt-get install build-essential module-assistant*;
5. Configure your system for building kernel modules by running *m-a prepare*;
6. Click on **Install Guest Additions…** from the **Devices** menu, then run *mount /media/cdrom*.
7. Run *sh /media/cdrom/VBoxLinuxAdditions.run*, and follow the instructions on screen.

Apt-get-update / -upgrade ist nicht notwendig, wenn man die virtuelle Maschine gerade installiert hat…

Bei Ausführung des 4. Schrittes werden wichtige Pakete heruntergeladen.

m-a prepare sorgt dafür, dass der Kernel veränderbar ist.

3.3 Knottenbelt Exercise III durcharbeiten

3.3.1 Describe three different ways of setting the permissions on a file or directory to r--r--r--. Create a file and see if this works.

```
felix@debian:~$ mkdir home
felix@debian:~$ cd home
felix@debian:~/home$ nano text
felix@debian:~/home$ cat text
Das ist eine ganz wichtige Datei!
felix@debian:~/home$
```

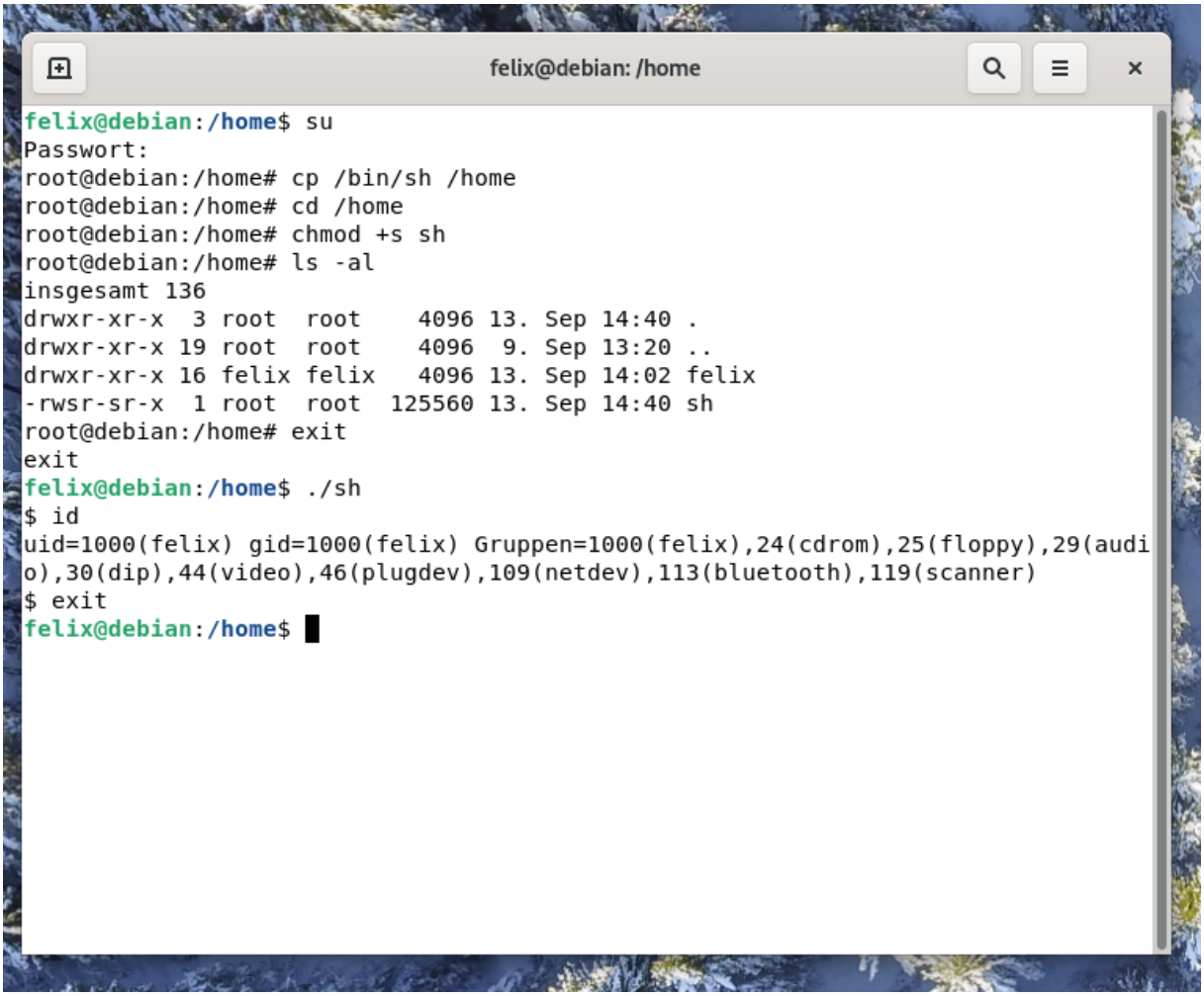
```
felix@debian:~/home$ ls -al
insgesamt 12
drwxr-xr-x  2 felix felix 4096  9. Sep 14:15 .
drwxr-xr-x 16 felix felix 4096  9. Sep 14:14 ..
-rw-r--r--  1 felix felix   34  9. Sep 14:15 text
```

```
felix@debian:~/home$ chmod 444 text
felix@debian:~/home$ ls -al
insgesamt 12
drwxr-xr-x  2 felix felix 4096  9. Sep 14:15 .
drwxr-xr-x 16 felix felix 4096  9. Sep 14:14 ..
-r--r--r--  1 felix felix   34  9. Sep 14:15 text
felix@debian:~/home$
```

```
felix@debian:~/home$ chmod 666 text
felix@debian:~/home$ ls -al
insgesamt 12
drwxr-xr-x  2 felix felix 4096  9. Sep 14:15 .
drwxr-xr-x 16 felix felix 4096  9. Sep 14:14 ..
-rw-rw-rw-  1 felix felix   34  9. Sep 14:15 text
felix@debian:~/home$ chmod a=r text
felix@debian:~/home$ ls -al
insgesamt 12
drwxr-xr-x  2 felix felix 4096  9. Sep 14:15 .
drwxr-xr-x 16 felix felix 4096  9. Sep 14:14 ..
-r--r--r--  1 felix felix   34  9. Sep 14:15 text
felix@debian:~/home$
```

```
root@debian:/home/felix/home# chmod 656 text
root@debian:/home/felix/home# ls -al
insgesamt 12
drwxr-xr-x  2 felix felix 4096  9. Sep 14:15 .
drwxr-xr-x 16 felix felix 4096  9. Sep 14:14 ..
-rw-r-xrw-  1 felix felix   34  9. Sep 14:15 text
root@debian:/home/felix/home# chmod -R a=r text
root@debian:/home/felix/home# ls -al
insgesamt 12
drwxr-xr-x  2 felix felix 4096  9. Sep 14:15 .
drwxr-xr-x 16 felix felix 4096  9. Sep 14:14 ..
-r--r--r--  1 felix felix   34  9. Sep 14:15 text
root@debian:/home/felix/home#
```

3.3.2 Team up with a partner. Copy /bin/sh to your home directory. Type "chmod +s sh". Check the permissions on sh in the directory listing. Now ask your partner to change into your home directory and run the program ./sh. Ask them to run the id command. What's happened? Your partner can type exit to return to their shell.



3.3.3 What would happen if the system administrator created a sh file in this way? Why is it sometimes necessary for a system administrator to use this feature using programs other than sh?

Würde ein Administrator die sh-Datei mittels dieser Methode erstellen, so könnte andere Benutzer die Date zwar ausführen, diese allerdings nicht verändern.

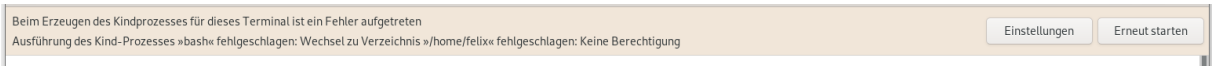
Dies muss der Administrator zum Beispiel machen, wenn er allen Benutzern ein Verzeichnis zur Verfügung stellt, das ausführbare Dateien enthalten soll, die allerdings nicht veränderbar sein sollen. Zum Beispiel Druckerkonfigurationen oder Netzwerkkonfigurationen. Der Vorteil dieses „sticky“-Bits ist, dass der Administrator persönlich die Datei zwar verändern kann, alle anderen Benutzer jedoch nicht.

3.3.4 Delete sh from your home directory (or at least to do a chmod -s sh).

```
root@debian:/home/felix# cd /home
root@debian:/home# ls
felix  sh
root@debian:/home# rm -f sh
root@debian:/home# ls
felix
root@debian:/home#
```

3.3.5 Modify the permissions on your home directory to make it completely private. Check that your partner can't access your directory. Now put the permissions back to how they were.

```
root@debian:/# ls -al
insgesamt 80
drwxr-xr-x 119 root root 12288 16. Sep 12:17 etc
drwxr-xr-x   3 root root  4096 16. Sep 12:37 home
lrwxrwxrwx   1 root root    30  9. Sep 13:11 initrd.
root@debian:/# chmod 700 /home
root@debian:/# ls -al
drwxr-xr-x 119 root root 12288 16. Sep 12:17 etc
drwx------   3 root root  4096 16. Sep 12:37 home
lrwxrwxrwx   1 root root    30  9. Sep 13:11 initrd
```



3.3.6 Type umask 000 and then create a file called world.txt containing the words "hello world". Look at the permissions on the file. What's happened? Now type umask 022 and create a file called world2.txt. When might this feature be useful?

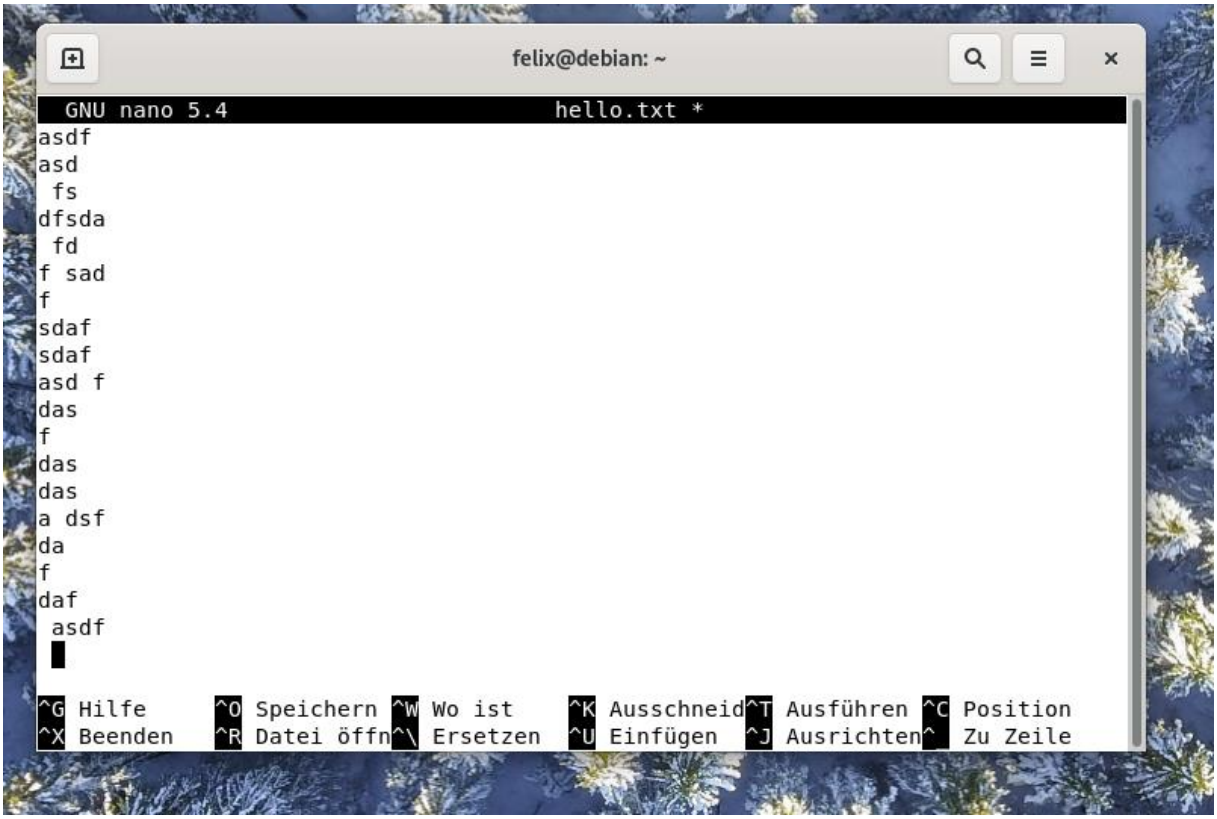
```
root@debian:/home/felix# umask 000
root@debian:/home/felix# touch world.txt
root@debian:/home/felix# pico world.txt
root@debian:/home/felix# ls -al
-rw-rw-rw-  1 root  root    12 16. Sep 12:59 world.txt
root@debian:/home/felix# umask 022
root@debian:/home/felix# touch world2.txt
root@debian:/home/felix# pico world2.txt
root@debian:/home/felix# ls -al
-rw-r--r--  1 root  root    12 16. Sep 13:01 world2.txt
-rw-rw-rw-  1 root  root    12 16. Sep 12:59 world.txt
root@debian:/home/felix#
```

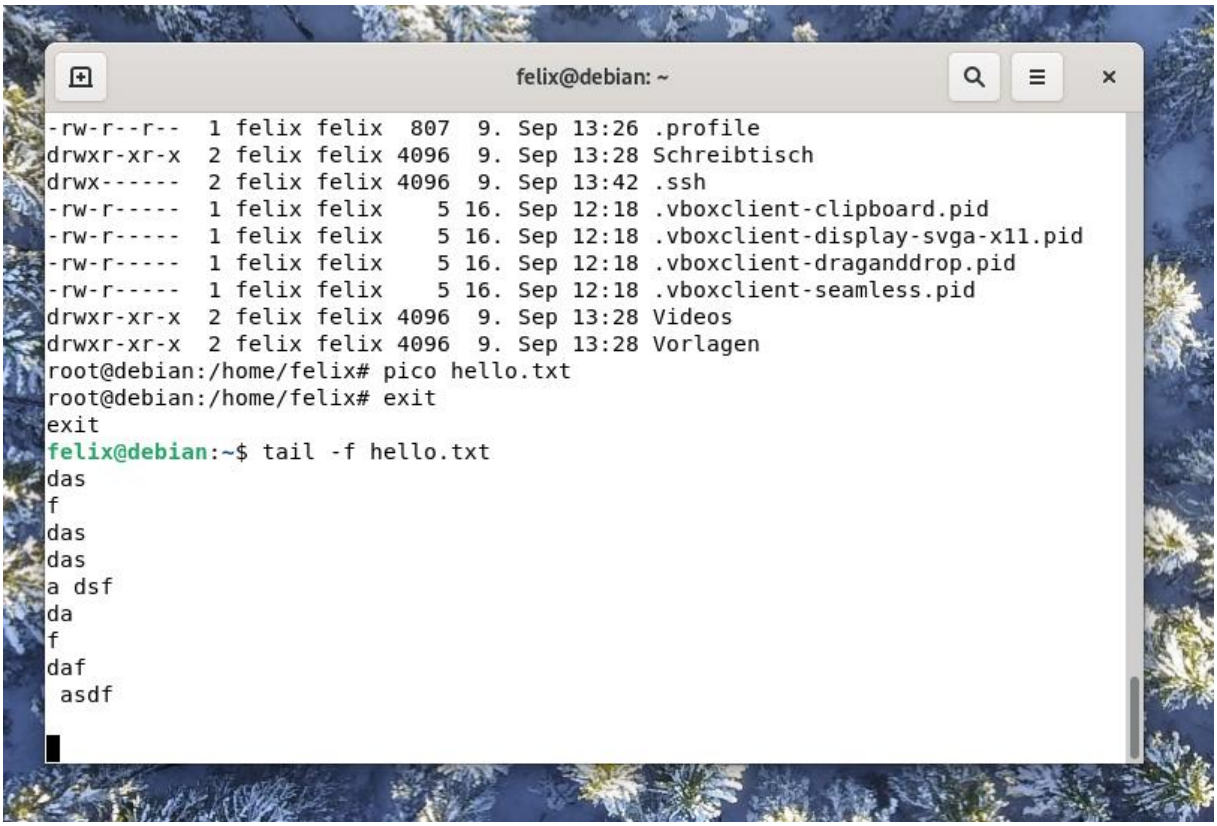
Mithilfe von umask kann man im Vorhinein schon festlegen, welche Berechtigungen die folgenden Dateien haben sollen.

3.3.7 Create a file called "hello.txt" in your home directory using the command cat -u > hello.txt. Ask your partner to change into your home directory and run tail -f hello.txt. Now type several lines into hello.txt. What appears on your partner's screen?

```
root@debian:/home/felix# cat -u > hello.txt

^C
root@debian:/home/felix# ls -al
insgesamt 100
```



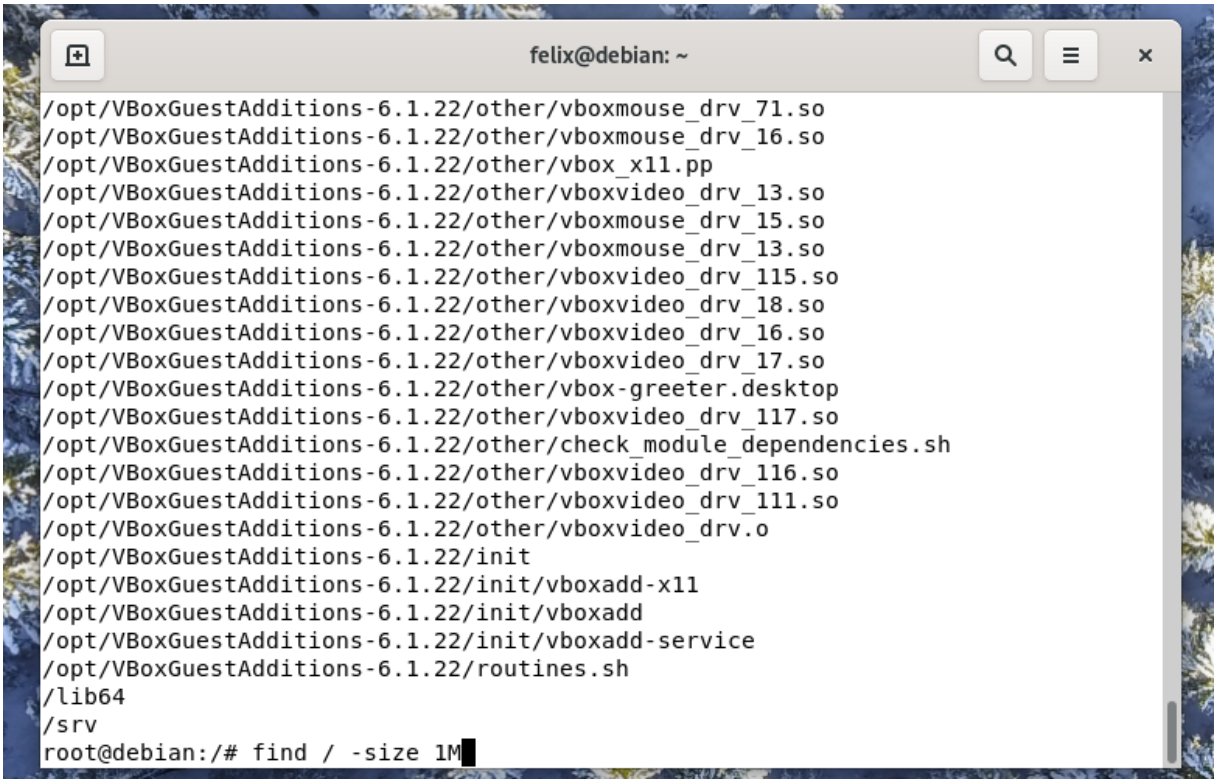


Der Partner sieht immer den „Footer“ der Datei.

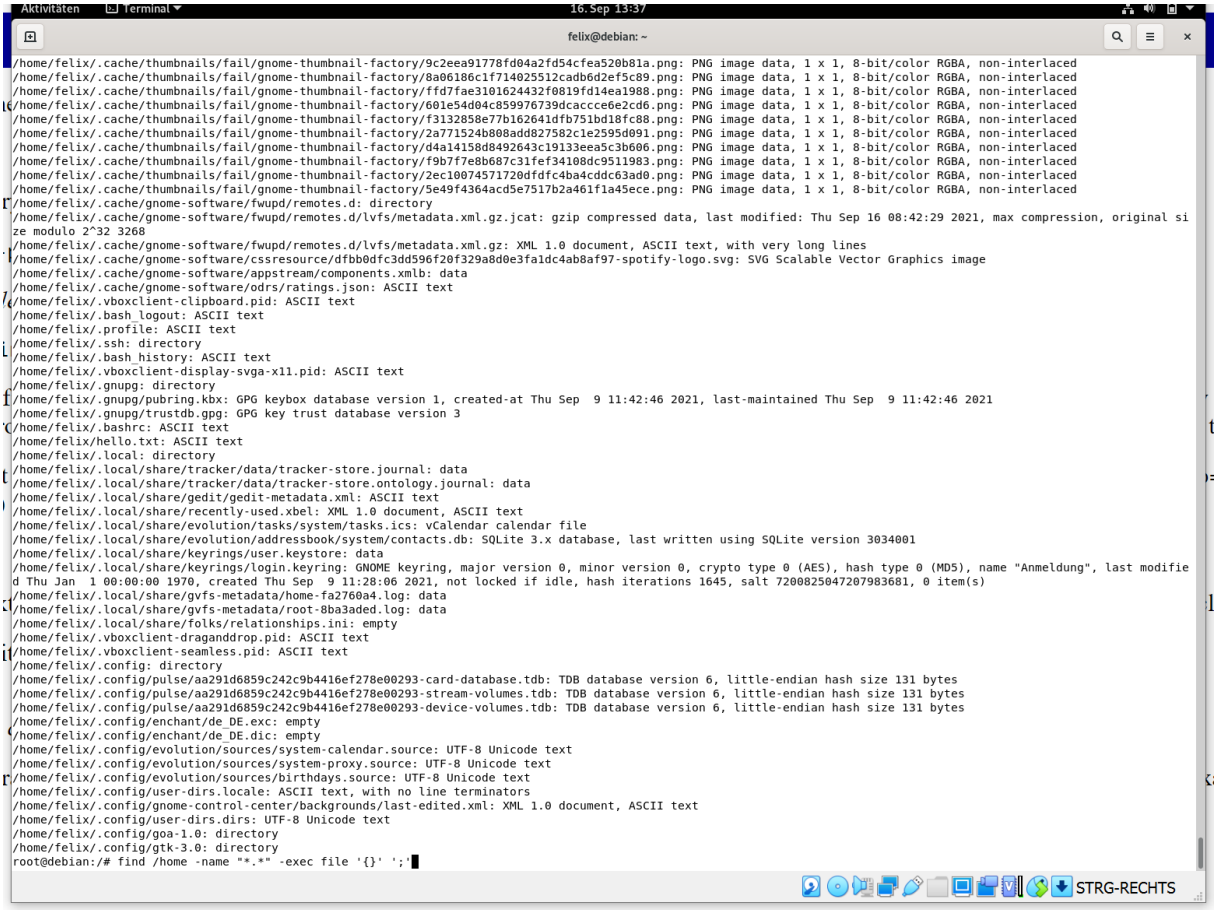
3.3.8 Use find to display the names of all files in the /home subdirectory tree. Can you do this without displaying errors for files you can't read?

```
root@debian:/home# cd ..
root@debian:/# find /home -name "*.*" -print 2> /dev/null
/home/felix/.cache
```

3.3.9 Use find to display the names of all files in the system that are bigger than 1MB.



3.3.10 Use find and file to display all files in the /home subdirectory tree, as well as a guess at what sort of a file they are. Do this in two different ways.



```
root@debian:/# find /home -name "*.*" -exec file '{}' ';'
```

3.3.11 Use grep to isolate the line in /etc/passwd that contains your login details.

```
root@debian:/etc# grep felix passwd
felix:x:1000:1000:felix,,,:/home/felix:/bin/bash
root@debian:/etc#
```

3.3.12 Use find and grep and sort to display a sorted list of all files in the /home subdirectory tree that contain the word hello somewhere inside them.

```
felix:x:1000:1000:felix,,,:/home/felix:/bin/bash
root@debian:/etc# find /home -name "*.*" | grep hello | sort
/home/felix/hello.txt
root@debian:/etc#
```

3.3.13 Use locate to find all filenames that contain the word emacs. Can you combine this with grep to avoid displaying all filenames containing the word lib?

```
root@debian:/# locate emacs | grep -v lib
/etc/emacs
/etc/emacs/site-start.d
/etc/emacs/site-start.d/50dictionaries-common.el
/etc/speech-dispatcher/clients/emacs.conf
/usr/share/emacs
/usr/share/emacsen-common
/usr/share/doc/emacsen-common
/usr/share/doc/dictionaries-common/README.emacs.gz
/usr/share/doc/emacsen-common/changelog.gz
/usr/share/doc/emacsen-common/copyright
/usr/share/doc/emacsen-common/debian-emacs-policy.gz
/usr/share/doc/emacsen-common/sample-package-install-foo
/usr/share/doc/emacsen-common/sample-package-remove-foo
/usr/share/emacs/site-lisp
/usr/share/emacs/site-lisp/desktop-entry-mode.el
/usr/share/emacsen-common/debian-startup.el
/usr/share/mime/text/x-emacs-lisp.xml
/usr/share/speech-dispatcher/conf/clients/emacs.conf
/usr/share/terminfo/d/dumb-emacs-ansi
/var/cache/dictionaries-common/emacsen-ispell-default.el
/var/cache/dictionaries-common/emacsen-ispell-dicts.el
```

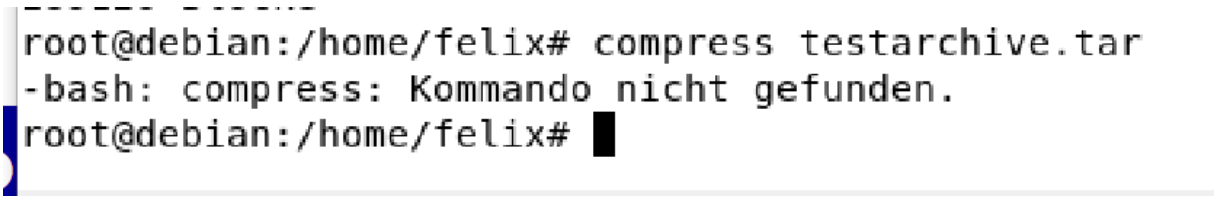
3.3.14 Create a file containing some lines that you think would match the regular expression: (^[0-9]{1,5}[a-zA-Z]+$)|none and some lines that you think would not match. Use egrep to see if your intuition is correct.


```
root@debian:/home/felix# egrep '(^[0-9]{1,5}[a-zA-Z]+$)|none' hello.txt
12345abcde
56789vwxyz
```

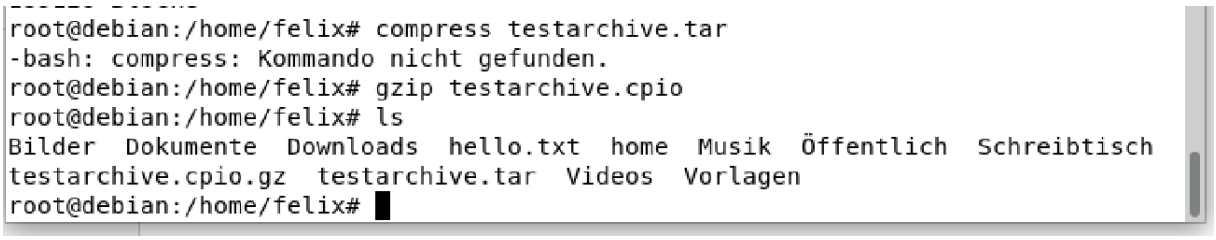
Es dürfen bis zu 5 Zahlen am Anfang der Zeile stehen, gefolgt von beliebigen Buchstaben.

3.3.15 Archive the contents of your home directory (including any subdirectories) using tar and cpio. Compress the tar archive with compress, and the cpio archive with gzip. Now extract their contents.

```
root@debian:/home/felix# tar -cvf testarchive.tar /home
tar: Entferne führende „/“ von Elementnamen
/home/
/home/felix/
/home/felix/Öffentlich/
/home/felix/.cache/
/home/felix/.cache/tracker/
/home/felix/.cache/tracker/db-locale.txt
/home/felix/.cache/tracker/db-version.txt
/home/felix/.cache/tracker/meta.db-shm
/home/felix/.cache/tracker/first-index.txt
/home/felix/.cache/tracker/meta.db
/home/felix/.cache/tracker/locale-for-miner-apps.txt
/home/felix/.cache/tracker/meta.db-wal
/home/felix/.cache/tracker/last-crawl.txt
/home/felix/.cache/tracker/parser-version.txt
/home/felix/.cache/tracker/ontologies.gvdb
/home/felix/.cache/event-sound-cache.tdb.aa291d6859c242c9b4416ef278e00293.x86_64
-pc-linux-gnu
```

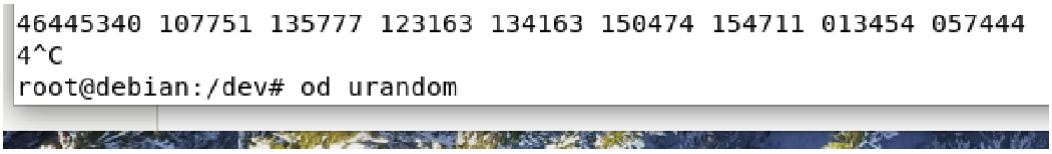


Das zusätzliche compress-Paket wollen wir nicht installieren, weil die Suche danach zu aufwendig ist und wir zu faul dafür sind ☺. Die komprimierte tar Datei hätte als Endung ein großes Z, bei cpio ist die Endung gz:

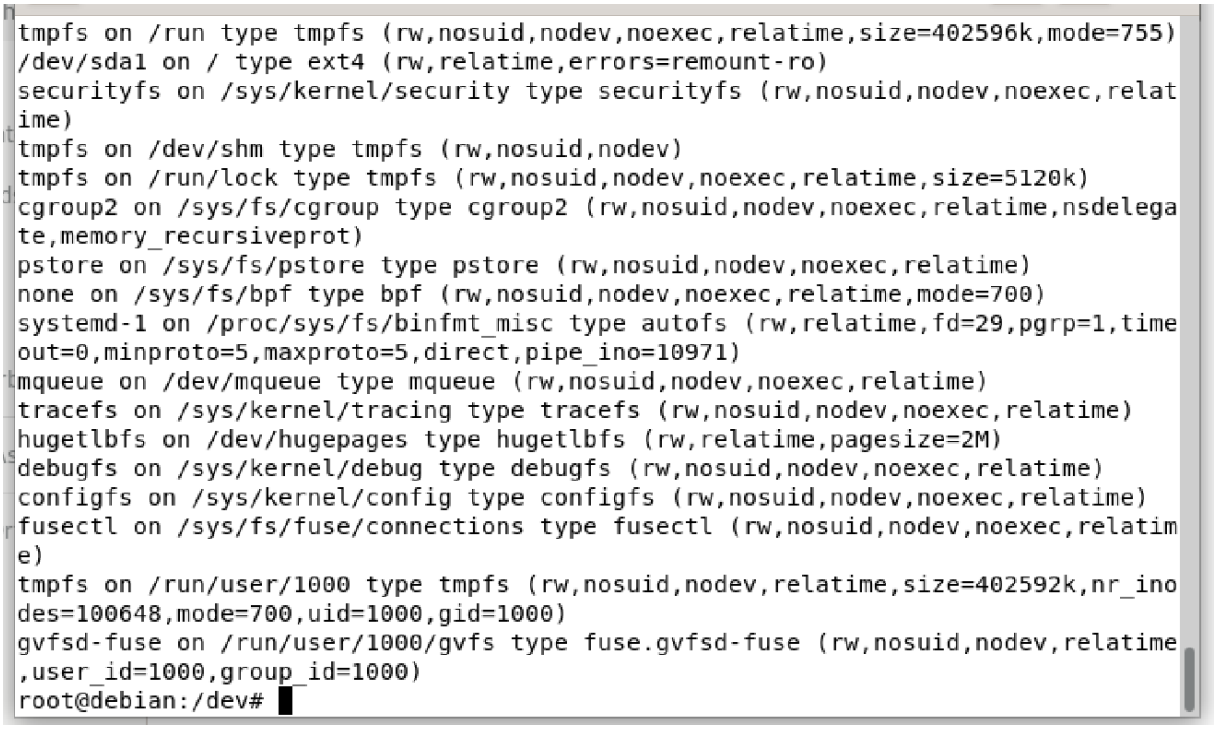


3.3.16 On Linux systems, the file /dev/urandom is a constantly generated random stream of characters. Can you use this file with od to printout a random decimal number?

```
20732720 110305 102164 041460 046170 123640 146450 143427 027302
20732740 132015 154047 154210 171577 156420 066421 034607 003113
20732760 046127 034632 144637 163005 060506 023213 023725 152711
20733000 072200 153505 020130 115700 164610 161513 023302 113106
20733020 010125 000534 164762 073327 014354 032176 106744 065016
20733040 002152 111636 124444 136577 130212 135006 126110 054762
20733060 120225 021621 010464 065263 056270 114442 034470 132145
20733100 127300 136403 175512 000270 172577 137414 054466 160555
20733120 045467 011521 121466 170561 015225 070475 034012 047314
20733140 066233 054254 104322 121625 171243 026012 130542 123172
20733160 056065 137433 072005 024015 031524 063631 035334 103522
20733200 133600 177361 072010 166742 104270 152363 115204 006133
20733220 073456 126721 076000 103454 033377 111222 020634 063534
20733240 003635 041407 012570 075260 037267 040273 140612 070665
20733260 043011 027027 000427 165377 062731 112304 065452 004751
20733300 075235 053471 151220 161453 006032 100721 044200 151640
20733320 116005 053474 137602 045566 012070 135200 022252 031055
20733340 161476 010513 022737 057240 130533 025405 103456 151735
20733360 052011 136221 073731 154773 117305 006541 103441 113305
20733400 144612 002731 124561 124054 111141 127334 043376 125256
20733420 144022 141524 056015 176734 035367 021140 015111 076277
20733440 117051 106122 004740 032170 142772 022034 160405 161361
20733460 176312 165537 015503 040766 163455 013235 070261 076571
20733500 154135 144425 000517 005773 030642 051731 163411 076401
```



3.3.17 Type mount (with no parameters) and try to interpret the output.



```
tmpfs on /run type tmpfs (rw,nosuid,nodev,noexec,relatime,size=402596k,mode=755)
/dev/sda1 on / type ext4 (rw,relatime,errors=remount-ro)
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relat
ime)
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev)
tmpfs on /run/lock type tmpfs (rw,nosuid,nodev,noexec,relatime,size=5120k)
cgroup2 on /sys/fs/cgroup type cgroup2 (rw,nosuid,nodev,noexec,relatime,nsdelega
te,memory_recursiveprot)
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime)
none on /sys/fs/bpf type bpf (rw,nosuid,nodev,noexec,relatime,mode=700)
systemd-1 on /proc/sys/fs/binfmt_misc type autofs (rw,relatime,fd=29,pgrp=1,time
out=0,minproto=5,maxproto=5,direct,pipe_ino=10971)
mqueue on /dev/mqueue type mqueue (rw,nosuid,nodev,noexec,relatime)
tracefs on /sys/kernel/tracing type tracefs (rw,nosuid,nodev,noexec,relatime)
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relatime,pagesize=2M)
debugfs on /sys/kernel/debug type debugfs (rw,nosuid,nodev,noexec,relatime)
configfs on /sys/kernel/config type configfs (rw,nosuid,nodev,noexec,relatime)
fusectl on /sys/fs/fuse/connections type fusectl (rw,nosuid,nodev,noexec,relatim
e)
tmpfs on /run/user/1000 type tmpfs (rw,nosuid,nodev,relatime,size=402592k,nr_ino
des=100648,mode=700,uid=1000,gid=1000)
gvfsd-fuse on /run/user/1000/gvfs type fuse.gvfsd-fuse (rw,nosuid,nodev,relatime
,user_id=1000,group_id=1000)
root@debian:/dev#
```

Ich interpretiere, dass das die eingehängten Datenträger zeilenweise ausgegeben werden.

4 Ergebnisse

Debian aufgesetzt

5 Kommentar

Die Interpretation ist natürlich von mir selbst.