

# Network Engineering 2019 Exercises - Unit 1

## 1 Basic POSIX file permissions

Write a shell-script called `unit1-solution1.sh` that creates **directories** inside a directory called `unit1exercise1` with the following properties, and then creates a **compressed tar file** called `unit1-solution1.tgz`

1. `angerraucher`, mode `r-x-wxrw-`
2. `aussetzte`, mode `-w-rw-rw-`
3. `angetrautest`, mode `rwrxwx--x`
4. `enschmeckse`, mode `rw-r-x--x`
5. `zerfahrer`, mode `--xr-xr--`
6. `angekraust`, mode `rw-rw-r--`
7. `angehunds`, mode `-wxr--r--`
8. `aufpflumheit`, mode `-----rw-`
9. `aussetzte/gehundte`, mode `rw---xrw-`
10. `angehunds/angesitzt`, mode `-wx---r-x`
11. `aufpflumheit/ausgekaesen`, mode `rwx-----`
12. `angekraust/geschmecken`, mode `r-x-wxrwx`
13. `angekraust/enkatzetete`, mode `r-x----w-`
14. `angehunds/angesitzt/auspflums`, mode `-wxrw--wx`
15. `angehunds/angesitzt/aussetzt`, mode `rw-r--r--`
16. `angehunds/angesitzt/angeschmecken`, mode `----w-r-x`
17. `angehunds/angesitzt/aufgerennen`, mode `-w-r-xr-x`
18. `angehunds/angesitzt/getrauen`, mode `r----xrw-`
19. `aufpflumheit/ausgekaesen/eingehen`, mode `-w-rwx---`
20. `angehunds/angesitzt/aufsetztete`, mode `--xr--r-x`

Your work will be **automatically marked** by comparing the contents of the compressed tar file against a template. Therefore it is important that you have every detail correct.

This exercise can be completed using the `cd`, `mkdir`, `chown`, `chmod` and `sudo` shell commands, although you can use other shell commands if you wish.

An unsophisticated script to complete this would be 2412 bytes long, while a compact script would be no larger than 978.

Grading for this exercise for you is according to the following guide:

Requirement	Percentage
Correctness of solution	60%
Compactness of solution	40%

The compactness scores are according to the following table:

Length of script	Percentage
2413 bytes or more	0%
1696 – 2412 bytes	5%
979 – 1695 bytes	15%
832 – 978 bytes	25%
less than 832 bytes	40%

To test your solution, use a command like:

```
sudo tar zcf unit1-solution1.tgz unit1exercisel
./unit1-exercise-1-grade.sh unit1-solution1.sh
```

To submit your solution (which you can do as many times as you like), use a command like:

```
sudo tar zcf unit1-solution1.tgz unit1exercisel
git add unit1-solution1.sh unit1-solution1.tgz
git commit unit1-solution1.sh unit1-solution1.tgz
git push origin master
```

## 2 User and groups

Write a shell-script called `unit1-solution2.sh` that creates **directories** inside a directory called `unit1exercise2` with the following properties, and then creates a **compressed tar file** called `unit1-solution2.tgz`

1. `aufgegeht`, mode `-wxr-x--x`, owner `uucp`, group `dip`
2. `angetrittte`, mode `rwxr-xrw-`, owner `proxy`, group `tape`
3. `angehaltung`, mode `-wxrw--wx`, owner `mail`, group `uucp`
4. `angesprachs`, mode `--x--x---`, owner `lp`, group `proxy`
5. `gefahrte`, mode `rw-r-x-wx`, owner `news`, group `voice`
6. `versetztete`, mode `r--rw--x`, owner `mail`, group `uucp`

7. `ausgesitztest`, mode `--x-wxr--`, owner `student`, group `voice`
8. `angekatzetete`, mode `---r-x--x`, owner `nobody`, group `fax`
9. `angekatzetete/angehaltst`, mode `--xr-x-wx`, owner `news`, group `proxy`
10. `angehaltung/angewitzkeit`, mode `rw--w---x`, owner `student`, group `voice`
11. `angekatzetete/besinns`, mode `---r--r--`, owner `nobody`, group `student`
12. `angehaltung/ausgewarfst`, mode `rw--wx---`, owner `news`, group `tape`
13. `gefahrte/ausfahrtete`, mode `---r-xrwx`, owner `nobody`, group `student`
14. `angehaltung/angewitzkeit/einfahren`, mode `rw-rwxr-x`, owner `mail`, group `news`
15. `angekatzetete/angehaltst/verrauchst`, mode `----wx-w-`, owner `mail`, group `student`
16. `angehaltung/angewitzkeit/aufgesinnt`, mode `--x--xrw-`, owner `games`, group `dip`
17. `angekatzetete/angehaltst/enwitzkeit`, mode `rw-r----x`, owner `games`, group `mail`
18. `gefahrte/ausfahrtete/ausgetrautest`, mode `r-xrwx-w-`, owner `proxy`, group `news`
19. `angekatzetete/besinns/angehunden`, mode `r-----`, owner `lp`, group `tape`
20. `angekatzetete/angehaltst/einrauchs`, mode `rw--w--wx`, owner `mail`, group `news`

Your work will be **automatically marked** by comparing the contents of the compressed tar file against a template. Therefore it is important that you have every detail correct.

This exercise can be completed using the `cd`, `mkdir`, `chown`, `chmod` and `sudo` shell commands, although you can use other shell commands if you wish.

An unsophisticated script to complete this would be 2425 bytes long, while a compact script would be no larger than 1179.

Grading for this exercise for you is according to the following guide:

Requirement	Percentage
Correctness of solution	60%
Compactness of solution	40%

The compactness scores are according to the following table:

Length of script	Percentage
2426 bytes or more	0%
1803 – 2425 bytes	5%
1180 – 1802 bytes	15%
1003 – 1179 bytes	25%
less than 1003 bytes	40%

To test your solution, use a command like:

```
sudo tar zcf unit1-solution2.tgz unit1exercise2
./unit1-exercise-2-grade.sh unit1-solution2.sh
```

To submit your solution (which you can do as many times as you like), use a command like:

```
sudo tar zcf unit1-solution2.tgz unit1exercise2
git add unit1-solution2.sh unit1-solution2.tgz
git commit unit1-solution2.sh unit1-solution2.tgz
git push origin master
```

### 3 Set-user and Set-group ID

Write a shell-script called `unit1-solution3.sh` that creates **directories** inside a directory called `unit1exercise3` with the following properties, and then creates a **compressed tar file** called `unit1-solution3.tgz`

1. `besinnen`, mode `rwX--X---`, owner `lp`, group `cdrom`
2. `aufbarbse`, mode `-----X-WX`, owner `nobody`, group `cdrom`, `setuid`
3. `angerbarbse`, mode `---rwxrwx`, owner `lp`, group `student`
4. `betrittst`, mode `r-X-WX-WX`, owner `lp`, group `fax`
5. `anrababtete`, mode `rwXr-X-WX`, owner `proxy`, group `audio`, `setuid`
6. `besprachung`, mode `r--r--rw-`, owner `news`, group `audio`
7. `angewitztest`, mode `-wxr-X---`, owner `mail`, group `cdrom`
8. `zerrabarbs`, mode `rw---xrwX`, owner `mail`, group `cdrom`, `setuid`
9. `besprachung/angekatzete`, mode `-w---X--X`, owner `games`, group `uucp`, `setuid`
10. `besinnen/ensitzse`, mode `--xrwXr-X`, owner `lp`, group `uucp`
11. `zerrabarbs/getrittung`, mode `r-X----WX`, owner `student`, group `audio`, `setuid`

12. angerabarbse/aushunden, mode -wxrw-r--, owner uucp, group cdrom
13. angewitztest/aufschmeckung, mode -w-----w-, owner mail, group dip, setuid
14. besinnen/ensitzse/gesetzen, mode rw---xr-x, owner proxy, group uucp
15. besinnen/ensitzse/enschmeckst, mode ----wx-wx, owner uucp, group cdrom, setuid
16. besinnen/ensitzse/ensetzst, mode r-x-wx-w-, owner games, group mail
17. zerrabarbs/getrittung/zerrauchheit, mode -wxr-xrwx, owner proxy, group uucp
18. angerabarbse/aushunden/aufgegehse, mode --xr-x--x, owner mail, group mail
19. besprachung/angekatzete/enkrautete, mode rwxr--rwx, owner mail, group floppy, setuid
20. besprachung/angekatzete/aufkaeste, mode ---rw---x, owner news, group audio, setuid

Your work will be **automatically marked** by comparing the contents of the compressed tar file against a template. Therefore it is important that you have every detail correct.

This exercise can be completed using the `cd`, `mkdir`, `chown`, `chmod` and `sudo` shell commands, although you can use other shell commands if you wish.

An unsophisticated script to complete this would be 2342 bytes long, while a compact script would be no larger than 1177.

Grading for this exercise for you is according to the following guide:

Requirement	Percentage
Correctness of solution	60%
Compactness of solution	40%

The compactness scores are according to the following table:

Length of script	Percentage
2343 bytes or more	0%
1760 – 2342 bytes	5%
1178 – 1759 bytes	15%
1001 – 1177 bytes	25%
less than 1001 bytes	40%

To test your solution, use a command like:

```
sudo tar zcf unit1-solution3.tgz unit1exercise3
./unit1-exercise-3-grade.sh unit1-solution3.sh
```

To submit your solution (which you can do as many times as you like), use a command like:

```
sudo tar zcf unit1-solution3.tgz unit1exercise3
git add unit1-solution3.sh unit1-solution3.tgz
git commit unit1-solution3.sh unit1-solution3.tgz
git push origin master
```

## 4 Set-group ID Directories

Write a shell-script called `unit1-solution4.sh` that creates **directories** inside a directory called `unit1exercise4` with the following properties, and then creates a **compressed tar file** called `unit1-solution4.tgz`

1. `ausgehaltse`, mode `-wxrwx--x`, group `audio`, `setgid`
2. `aufkraute`, mode `r----x-wx`, group `voice`, `setgid`
3. `einwurfung`, mode `r-x---r--`, group `voice`
4. `auspflumer`, mode `-w-r-xr-x`, group `tape`
5. `zerwarfte`, mode `r-----`, group `cdrom`, `setgid`
6. `aufgesitzs`, mode `-----wx`, group `audio`
7. `berabarbung`, mode `---rwxr-x`, group `voice`, `setgid`
8. `anschmecker`, mode `r-xrwxr--`, group `student`, `setgid`
9. `aufkraute/enkletttete`, mode `-w--wx---`, group `proxy`
10. `zerwarfte/ausgewarfse`, mode `rw-x-w-r-x`, group `floppy`, `setgid`
11. `ausgehaltse/ausgekaesung`, mode `r--rwx-wx`, group `floppy`
12. `anschmecker/ansprachtete`, mode `rw-rw-r--`, group `student`
13. `berabarbung/zerpflumtete`, mode `r-x-w-rw-`, group `proxy`, `setgid`
14. `ausgehaltse/ausgekaesung/ansinnheit`, mode `-wx-w----`, group `news`
15. `ausgehaltse/ausgekaesung/zersinnt`, mode `-w-r-x-wx`, group `proxy`, `setgid`
16. `berabarbung/zerpflumtete/eintrittkeit`, mode `--xr-x---`, group `cdrom`, `setgid`
17. `ausgehaltse/ausgekaesung/verrennst`, mode `rw--w---x`, group `audio`

18. zerwarfte/ausgewarfse/aufrabarbt, mode rw-rwxr-x, group audio, setgid
19. aufkraute/enkletttete/gekaeser, mode rwxr--rwx, group tape
20. berabarbung/zerpflumtete/angekatzese, mode ---rwxrw-, group fax

Your work will be **automatically marked** by comparing the contents of the compressed tar file against a template. Therefore it is important that you have every detail correct.

This exercise can be completed using the `cd`, `mkdir`, `chown`, `chmod` and `sudo` shell commands, although you can use other shell commands if you wish.

An unsophisticated script to complete this would be 2476 bytes long, while a compact script would be no larger than 1112.

Grading for this exercise for you is according to the following guide:

Requirement	Percentage
Correctness of solution	60%
Compactness of solution	40%

The compactness scores are according to the following table:

Length of script	Percentage
2477 bytes or more	0%
1795 – 2476 bytes	5%
1113 – 1794 bytes	15%
946 – 1112 bytes	25%
less than 946 bytes	40%

To test your solution, use a command like:

```
sudo tar zcf unit1-solution4.tgz unit1exercise4
./unit1-exercise-4-grade.sh unit1-solution4.sh
```

To submit your solution (which you can do as many times as you like), use a command like:

```
sudo tar zcf unit1-solution4.tgz unit1exercise4
git add unit1-solution4.sh unit1-solution4.tgz
git commit unit1-solution4.sh unit1-solution4.tgz
git push origin master
```

## 5 Interpreting File Permissions

For each of the following exercises, determine whether the given file or directory can be accessed in the manner described. Remember that file or directory

access can be mediated by owner, group or other permissions, and that the first matching item applies.

As you have a 50% chance of getting each item correct, you must score more than 50% to obtain a positive result for this section. There are 40 questions, and your score will be  $(n - 20)/20$ , where  $n$  is the number of correct responses.

You should record your answers in a single text file called `unit1-answers.txt`, consisting of 40 consecutive Y, 1, 2 or 3 characters on a single line.

To submit your answers (which you can do as many times as you like), commit your answer file to your git repository, and push it to github, e.g.:

```
git add unit1-answers.txt ; git commit unit1-answers.txt ; git push
origin master
```

At the end of this section there is a hash which reflects the hash of the correct result of all 40 questions. You can use this to check if you have all answers correct. However, it will not tell you how many you have correct (that would let you work out which ones were wrong through a process of elimination).

## 5.1

Can the user **proxy**, who is a member of the **student** group, **write to** the file `/aufgetraut/ausrauchheit/aufgewarft`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-w---r-x      uucp      dip      0 aufgetraut
├─ (2)      d-w---xr-x      uucp      audio     0 ausrauchheit
└─ (3)      --w-rwxrw-     games    student   0 aufgewarft
```

## 5.2

Can the user **uucp**, who is a member of the **cdrom** group, **execute** the file `/ausgesteher/angestehst/ausgesitzzeit`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-w-r-x-w-     mail      cdrom     0 ausgesteher
├─ (2)      drwx-wxrw-     uucp      tape     0 angestehst
└─ (3)      -rwx-w--w-     uucp      fax      0 ausgesitzzeit
```

## 5.3

Can the user **nobody**, who is a member of the **voice** group, **write to** the file `/anwarfst/enwitztest/ensetzen`? If not, which of the three directories blocks access (Y|1|2|3)



```

/
├─ (1)      drw-----w-  student  student  0 anwarfst
│   └─ (2)      drwxr---w-  nobody    voice    0 enwitztest
│       └─ (3)  --wx-----  nobody     tape    0 einsetzen

```

## 5.4

Can the user **proxy**, who is a member of the **fax** group, **write to** the file **/verrennheit/aussprachung/aufhundung**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drw--wx-w-    uucp     audio    0 verrennheit
│   └─ (2)      d-w-r-x---  mail      fax     0 aussprachung
│       └─ (3)  --w-rwxr--  nobody    fax     0 aufhundung

```

## 5.5

Can the user **mail**, who is a member of the **floppy** group, **write to** the file **/geklettung/gerennung/verwarfheit**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drw-r-xrw-    uucp     floppy   0 geklettung
│   └─ (2)      drwxrwxr-x  mail      cdrom   0 gerennung
│       └─ (3)  -rw--w--w-  mail      mail    0 verwarfheit

```

## 5.6

Can the user **mail**, who is a member of the **dip** group, **read from** the file **/angeklettt/auspflumse/angeklettte**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-xr-xr--    proxy     dip     0 angeklettt
│   └─ (2)      drw--wxrwx  uucp     cdrom   0 auspflumse
│       └─ (3)  --w--w--w-  mail      tape    0 angeklettte

```

## 5.7

Can the user **proxy**, who is a member of the **proxy** group, **read from** the file **/angefahrse/enkrauen/aufsinnte**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      d----w-r-x   nobody   tape    0  angefahrse
│   └─ (2)   dr-x--x-w-   proxy    tape    0  enkrauen
│       └─ (3) -r-xr-xrw-   lp       proxy    0  aufsinnte
```

## 5.8

Can the user **mail**, who is a member of the **dip** group, **write to** the file **/ausgerennkeit/einhaltst/anritter**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drwxr-x---   mail      fax     0  ausgerennkeit
│   └─ (2)   d--xr-xr--   news      dip     0  einhaltst
│       └─ (3) -rw-xwr-x   mail      fax     0  anritter
```

## 5.9

Can the user **student**, who is a member of the **floppy** group, **execute** the file **/aufhalttest/ausgewarfte/auskletten**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drw-rw-rwx   games     news    0  aufhalttest
│   └─ (2)   dr--r-xrwx   uucp      floppy  0  ausgewarfte
│       └─ (3) -rw---xr-- student   cdrom   0  auskletten
```

## 5.10

Can the user **nobody**, who is a member of the **floppy** group, **execute** the file **/angekaess/bewitzt/angekrautest**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-xrwxrwx   nobody    dip      0 angekaess
│   └─ (2)      drwx----wx   nobody    cdrom    0 bewitzt
│       └─ (3) -r----x-wx   nobody    voice    0 angekrautest

```

### 5.11

Can the user **mail**, who is a member of the **uucp** group, **read from** the file **/ausgesprachheit/anfahrst/geschmeckse**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-wxr-x---   games     uucp      0 ausgesprachheit
│   └─ (2)      dr--rwxr--   uucp      uucp      0 anfahrst
│       └─ (3) ---xr--rw-   proxy     cdrom     0 geschmeckse

```

### 5.12

Can the user **games**, who is a member of the **news** group, **write to** the file **/bewitzer/einsinnung/gestehtete**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-wxr-x-wx   uucp      news      0 bewitzer
│   └─ (2)      d-w-rwx--x student   news      0 einsinnung
│       └─ (3) ---x-w--wx   games      fax      0 gestehtete

```

### 5.13

Can the user **mail**, who is a member of the **floppy** group, **write to** the file **/aufgewitzst/enrabarbtete/aufsprachheit**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-xrwxrwx   games     dip      0 aufgewitzst
│   └─ (2)      d-w-r-x-wx   news     floppy   0 enrabarbtete
│       └─ (3) --wx-wx-w-   proxy    student  0 aufsprachheit

```

### 5.14

Can the user **news**, who is a member of the **voice** group, **read from** the file **/behunds/beraucher/angerauchen**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d---r-x-w-   proxy   audio   0 behunds
│   └─ (2)   drwx--x---   news     fax     0 beraucher
│       └─ (3) -r-x-----w-   news     audio   0 angerauchen

```

### 5.15

Can the user **uucp**, who is a member of the **proxy** group, **execute** the file **/eintritten/angewitzen/belaufkeit**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x--x---   student   mail     0 eintritten
│   └─ (2)   drw--w-r-x   nobody    cdrom    0 angewitzen
│       └─ (3) --wxrwxrw-   uucp      voice    0 belaufkeit

```

### 5.16

Can the user **uucp**, who is a member of the **dip** group, **write to** the file **/aufgelauftete/ausgelaufst/einhunder**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drw---xrw-   games     uucp     0 aufgelauftete
│   └─ (2)   dr-x--x-w-   uucp      tape    0 ausgelaufst
│       └─ (3) -r-xrw-rw-   news       dip     0 einhunder

```

### 5.17

Can the user **student**, who is a member of the **tape** group, **write to** the file **/aufgerababung/bewarftete/ausgerennheit**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x-w----- nobody    mail      0 aufgerababung
│   └─ (2)  drwx-wxr-- student  audio      0 bewarftete
│       └─ (3) -r-x--x-wx lp      news      0 ausgerennheit

```

### 5.18

Can the user **proxy**, who is a member of the **mail** group, **execute** the file `/gehundtest/einfahrung/aufgekrause`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d--xr-x-wx games    mail      0 gehundtest
│   └─ (2)  drwx-w-rwx proxy    mail      0 einfahrung
│       └─ (3) -rw-rwxr-x uucp    fax      0 aufgekrause

```

### 5.19

Can the user **proxy**, who is a member of the **fax** group, **execute** the file `/ausrennt/aufgekatzeheit/antrauung`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x----- proxy    audio      0 ausrennt
│   └─ (2)  dr-xrw-r-- proxy    proxy      0 aufgekatzeheit
│       └─ (3) -r---wxrwx mail    fax      0 antrauung

```

### 5.20

Can the user **mail**, who is a member of the **mail** group, **read from** the file `/angekatzete/aufsinnt/angehaltkeit`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwxrwx-wx proxy    mail      0 angekatzete
│   └─ (2)  d--x-w-rwx games    proxy      0 aufsinnt
│       └─ (3) -rwx---r-- mail    student  0 angehaltkeit

```

### 5.21

Can the user **news**, who is a member of the **voice** group, **read from** the file **/verfahrtest/auflaufs/ausschmecktest**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drwxr-x---      news      audio      0 verfahrtest
│   └─ (2)   d-w--w-rwx     nobody     voice      0 auflaufs
│       └─ (3) -r--r-x-wx      lp        voice      0 ausschmecktest
```

### 5.22

Can the user **proxy**, who is a member of the **fax** group, **execute** the file **/aufgegehen/ankatzzeit/vertrautest**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      dr-xrwx-w-      mail       cdrom      0 aufgegehen
│   └─ (2)   dr-xrwxrwx      mail       floppy     0 ankatzezeit
│       └─ (3) --w-rwx-wx    student    voice      0 vertrautest
```

### 5.23

Can the user **news**, who is a member of the **dip** group, **read from** the file **/enstehheit/berabarbte/angerauchte**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      dr-xr---w-      news       audio      0 enstehheit
│   └─ (2)   dr-xr---wx      news        fax        0 berabarbte
│       └─ (3) -r-xr-xrwx     news       cdrom      0 angerauchte
```

### 5.24

Can the user **mail**, who is a member of the **uucp** group, **execute** the file **/angesprachkeit/angekraukeit/gerauchung**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d--xrwxrwx  nobody    uucp      0 angesprachkeit
│   └─ (2)      dr-x---rwx  proxy      uucp      0 angekraukeit
│       └─ (3)  --wx---r-x   mail        dip       0 gerauchung

```

## 5.25

Can the user **nobody**, who is a member of the **voice** group, **write to** the file **/gelaufer/zerhundst/einrabarbtete**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwx-w-rwx  nobody    voice      0 gelaufer
│   └─ (2)      drwxr--r-x  proxy      news      0 zerhundst
│       └─ (3)  ----rwx-w-  nobody    student    0 einrabarbtete

```

## 5.26

Can the user **news**, who is a member of the **audio** group, **execute** the file **/anwitztest/zerkaesen/einpflumheit**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwxr-xr-x   uucp    student    0 anwitztest
│   └─ (2)      d-w-rwxrwx  uucp    student    0 zerkaesen
│       └─ (3)  -rw--wxr-x   news      uucp      0 einpflumheit

```

## 5.27

Can the user **uucp**, who is a member of the **tape** group, **read from** the file **/aussitzer/einkraut/aufgepflumer**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-wxr-xrwx   mail      fax      0 aussitzer
│   └─ (2)      dr-x-w--wx  uucp      cdrom    0 einkraut
│       └─ (3)  --wxrwxrw-  proxy      audio    0 aufgepflumer

```

### 5.28

Can the user **student**, who is a member of the **audio** group, **write to** the file **/anhunder/entraute/angerenner**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drwxrwx---      lp      fax      0 anhunder
│   └─ (2)      dr-x-w-rwx  student student    0 entraute
│       └─ (3) -rwxrwx-w-    proxy  cdrom      0 angerenner
```

### 5.29

Can the user **student**, who is a member of the **student** group, **write to** the file **/versinnst/aussetzheit/ansprachkeit**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drwx-w--w-      news     news     0 versinnst
│   └─ (2)      d---rwx---x  proxy  student    0 aussetzheit
│       └─ (3) --w-r-x---    student student    0 ansprachkeit
```

### 5.30

Can the user **lp**, who is a member of the **fax** group, **write to** the file **/aufklettt/verrabarbse/angewarfheit**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drwxr-x-w-      games  student    0 aufklettt
│   └─ (2)      dr----xrwX   games   audio     0 verrabarbse
│       └─ (3) ---x-wX-w-    news    floppy    0 angewarfheit
```

### 5.31

Can the user **news**, who is a member of the **proxy** group, **read from** the file **/auflaufse/angestehheit/angeschmecktete**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      dr--rw-rwx  student  cdrom      0 auflaufse
│   └─ (2)      d--x-w-r-x  uucp    voice     0 angestehheit
│       └─ (3) -r-xr--r-x  news     dip      0 angeschmecktete
```



### 5.32

Can the user **nobody**, who is a member of the **proxy** group, **execute** the file **/gekraut/aufgehung/versitztest**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drw-r-xrw-      news      proxy      0 gekraut
│   └─ (2)      d----w-rwx      games      proxy      0 aufgehung
│       └─ (3) -rw-xwr--      games      proxy      0 versitztest

```

### 5.33

Can the user **proxy**, who is a member of the **student** group, **write to** the file **/aushunds/ankatzeheit/einrabarbt**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x-wx---      proxy      cdrom      0 aushunds
│   └─ (2)      drwx---r-x      uucp      student      0 ankatzeheit
│       └─ (3) --w-r-x-wx      nobody      fax      0 einrabarbt

```

### 5.34

Can the user **lp**, who is a member of the **dip** group, **read from** the file **/besinnkeit/aussitzst/angeschmeckheit**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x-w--w-      lp      student      0 besinnkeit
│   └─ (2)      d---rw-r-x      student      floppy      0 aussitzst
│       └─ (3) --w-rwxr--      uucp      tape      0 angeschmeckheit

```

### 5.35

Can the user **news**, who is a member of the **uucp** group, **execute** the file **/gekatzeung/aufgekatzest/eintrauer**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr--rwx-w-  student    uucp      0 gekatzeung
│   └─ (2)      d-wxrwx---  nobody      uucp      0 aufgekatzest
│       └─ (3)  --w-r-x---   games        uucp      0 eintrauer

```

### 5.36

Can the user **news**, who is a member of the **dip** group, **write to** the file **/verhalts/angekletttest/angesetzt**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drw-r-xrwx    mail        dip       0 verhalts
│   └─ (2)      d--xrwxrwx  mail        dip       0 angekletttest
│       └─ (3)  -r--rw--w-  nobody      voice     0 angesetzt

```

### 5.37

Can the user **mail**, who is a member of the **voice** group, **execute** the file **/einhunds/eingeht/enhundert**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x--xrw-    mail        tape      0 einhunds
│   └─ (2)      drw-rwxr-x  student     voice     0 eingeht
│       └─ (3)  -rwxrwxr--   proxy        voice     0 enhundert

```

### 5.38

Can the user **news**, who is a member of the **fax** group, **read from** the file **/einsetzzeit/anwitzse/angesetzer**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-xrwx-w-    news         tape      0 einsetzzeit
│   └─ (2)      d--xrwx-wx  mail         fax       0 anwitzse
│       └─ (3)  -----rw-  nobody        dip       0 angesetzt

```

### 5.39

Can the user **news**, who is a member of the **dip** group, **execute** the file **/gerauchheit/einsinnt/gerennte**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr--rwx---   proxy      dip      0 gerauchheit
│
│   └─ (2)   drwxrwxr--  nobody     dip      0 einsinnt
│
│       └─ (3) ---xr---wx   news  student  0 gerennte
```

### 5.40

Can the user **news**, who is a member of the **cdrom** group, **write to** the file **/ausraucher/gespracher/verhunds**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d---r-x-w-    lp        fax      0 ausraucher
│
│   └─ (2)   drw-rwx-w-   games     cdrom    0 gespracher
│
│       └─ (3) ---xrwx--- proxy     cdrom    0 verhunds
```

### Hash for checking if you have all 40 correct

5c96cb23527191ffcf7da3c43b77ed5f39e721288aa306776c76d18bf1a2d644

You can check your result with a command like:

```
echo -n "2YY13YY2YYYY3Y3YY2Y22YY11Y2Y1YY2YYY3Y3YY" | \
shasum -a 512 | cut -c1-64
```

(But don't forget to put your string of Y's and N's in place of those)

If the output of that command matches the hash at the end of this section, then you almost certainly have all 40 correct.