

# 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. `verwitztest`, mode `-wxrwx---`
2. `angehaltheit`, mode `---r-xr--`
3. `anwitzkeit`, mode `----wxr--`
4. `getraueheit`, mode `rw---xr--`
5. `angerauchheit`, mode `---r-----`
6. `angerauchtete`, mode `-wxrwx-w-`
7. `auswitztest`, mode `r-xrw--w-`
8. `ankatzeen`, mode `-wx--x--x`
9. `auswitztest/aufgekatzet`, mode `r---w---x`
10. `angerauchtete/aufgesprachtete`, mode `-w-r-----x`
11. `angehaltheit/aufgestehte`, mode `-wx-wx---`
12. `ankatzeen/zerrennen`, mode `--xrwxr-x`
13. `angehaltheit/ausgesetzter`, mode `r----xr--`
14. `ankatzeen/zerrennen/angestehheit`, mode `--xr--r--`
15. `angehaltheit/ausgesetzter/ausgefahrt`, mode `r-xrw-r-x`
16. `angerauchtete/aufgesprachtete/zersitzkeit`, mode `rw---x--x`
17. `angehaltheit/aufgestehte/angeschmeckheit`, mode `-wx--x--x`
18. `ankatzeen/zerrennen/angegehtest`, mode `-wx--x-w-`
19. `angehaltheit/aufgestehte/behaltkeit`, mode `-wx--x-wx`
20. `angehaltheit/aufgestehte/gekaesung`, mode `rw--w---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 2577 bytes long, while a compact script would be no larger than 989.

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 |
|---------------------|------------|
| 2578 bytes or more  | 0%         |
| 1784 – 2577 bytes   | 5%         |
| 990 – 1783 bytes    | 15%        |
| 841 – 989 bytes     | 25%        |
| less than 841 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. `verhaltete`, mode `r-x-w-r-x`, owner `uucp`, group `proxy`
2. `austrauheit`, mode `r----x--x`, owner `uucp`, group `mail`
3. `angetrauer`, mode `-----x---`, owner `proxy`, group `uucp`
4. `aufschmeckst`, mode `-wxrwx-wx`, owner `uucp`, group `audio`
5. `einfahren`, mode `rwx-----`, owner `student`, group `news`
6. `zerrabart`, mode `r-xrw-rw-`, owner `student`, group `audio`

7. ausgerauchkeit, mode rw---xrw-, owner nobody, group uucp
8. zerkatzete, mode ----w--wx, owner nobody, group news
9. einfahren/angesinnnte, mode rwxr-x-w-, owner uucp, group proxy
10. zerrabarbt/einwarft, mode rwxrwx-wx, owner lp, group uucp
11. ausgerauchkeit/aufgeklettheit, mode --xr--r-x, owner nobody, group floppy
12. angetrauer/ensetzkeit, mode --xr--rwx, owner mail, group proxy
13. aufschmeckst/ausgerauchte, mode r-xr-x---, owner proxy, group dip
14. ausgerauchkeit/aufgeklettheit/gesetzter, mode r-xr--r--, owner mail, group news
15. zerrabarbt/einwarft/verfahrs, mode rw--w-rw-, owner nobody, group news
16. zerrabarbt/einwarft/aufgetritts, mode rw-r--rw-, owner news, group news
17. angetrauer/ensetzkeit/aufhalttete, mode rwx---rwx, owner news, group tape
18. einfahren/angesinnnte/geklett, mode ---r--rwx, owner lp, group news
19. ausgerauchkeit/aufgeklettheit/einwitzt, mode r-x-w----, owner proxy, group mail
20. einfahren/angesinnnte/ausfahrse, mode --x-w----, owner proxy, group tape

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 2393 bytes long, while a compact script would be no larger than 1198.

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 |
|----------------------|------------|
| 2394 bytes or more   | 0%         |
| 1796 – 2393 bytes    | 5%         |
| 1199 – 1795 bytes    | 15%        |
| 1019 – 1198 bytes    | 25%        |
| less than 1019 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. `ausgesetzte`, mode `r-x-w-r--`, owner `student`, group `cdrom`, `setuid`
2. `zergehtest`, mode `-w-r-----`, owner `uucp`, group `fax`, `setuid`
3. `angestehte`, mode `-wx-wxrw`, owner `student`, group `mail`
4. `gekaesheit`, mode `r--r--rwx`, owner `student`, group `uucp`
5. `auffahrtete`, mode `r-x-w--wx`, owner `lp`, group `floppy`, `setuid`
6. `zertrautete`, mode `--xrw---x`, owner `student`, group `news`, `setuid`
7. `aufwarftete`, mode `r--rwx-w-`, owner `games`, group `audio`, `setuid`
8. `verrabarbarkeit`, mode `rw---x-wx`, owner `news`, group `audio`, `setuid`
9. `zergehtest/getrauen`, mode `rwx--xr--`, owner `games`, group `proxy`
10. `auffahrtete/angesprachung`, mode `r-x--xr-x`, owner `lp`, group `voice`
11. `verrabarbarkeit/zerfahren`, mode `----w---x`, owner `news`, group `fax`
12. `aufwarftete/zerlaufse`, mode `r-x-w-r-x`, owner `student`, group `audio`, `setuid`

13. zertrautete/aufgewitzung, mode `rwX-w----`, owner `uucp`, group `dip`
14. zergehtest/getrauen/angewarftete, mode `-wX-w--wX`, owner `lp`, group `fax`
15. verrabarbarkeit/zerfahren/angegeher, mode `-w-rw-r--`, owner `student`, group `tape`, `setuid`
16. verrabarbarkeit/zerfahren/zerwitztest, mode `-w-r-x--x`, owner `news`, group `floppy`
17. zergehtest/getrauen/angekrause, mode `-wX-w--wX`, owner `uucp`, group `cdrom`, `setuid`
18. zertrautete/aufgewitzung/angetrittheit, mode `r--rw-r-x`, owner `games`, group `audio`
19. zertrautete/aufgewitzung/zerkatzeung, mode `r-xrw-r--`, owner `nobody`, group `audio`, `setuid`
20. zertrautete/aufgewitzung/angewarft, mode `r-x-w---x`, owner `lp`, group `news`, `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 2443 bytes long, while a compact script would be no larger than 1246.

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 |
|----------------------|------------|
| 2444 bytes or more   | 0%         |
| 1845 – 2443 bytes    | 5%         |
| 1247 – 1844 bytes    | 15%        |
| 1060 – 1246 bytes    | 25%        |
| less than 1060 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. ausschmecker, mode `--xrw-w-`, group `uucp`, `setgid`
2. aufwitzte, mode `---rw-rw-`, group `voice`
3. verpflums, mode `--x-w-rwx`, group `news`
4. zertrauung, mode `-wxr-xr-x`, group `voice`
5. aufgehalttete, mode `---r--r--`, group `fax`, `setgid`
6. angesinner, mode `----w-r--`, group `cdrom`, `setgid`
7. angewarfen, mode `--x----w-`, group `floppy`, `setgid`
8. engehte, mode `r-xrw-w-`, group `fax`, `setgid`
9. engehte/aufgekaess, mode `r-xrw-rwx`, group `audio`, `setgid`
10. angewarfen/aufkaestete, mode `r-----r--`, group `proxy`, `setgid`
11. engehte/aufrabarbs, mode `-w-rw--wx`, group `proxy`, `setgid`
12. angewarfen/ausgepflumung, mode `-----r-x`, group `cdrom`
13. zertrauung/verschmeckst, mode `-w--wx--x`, group `mail`
14. angewarfen/ausgepflumung/aufgehaltung, mode `r----xrw-`, group `audio`
15. angewarfen/aufkaestete/angewitzse, mode `--xrw--wx`, group `floppy`
16. angewarfen/ausgepflumung/gefahrkeit, mode `r--r---w-`, group `proxy`, `setgid`
17. engehte/aufgekaess/angekaestest, mode `---rwxrwx`, group `student`, `setgid`
18. engehte/aufrabarbs/befahrse, mode `rw-r-xr--`, group `audio`

19. `engehte/aufrabarbs/ankatzese`, mode `--x-wx---`, group `dip`

20. `engehte/aufrabarbs/angehundse`, mode `---rw----`, group `mail`

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 2387 bytes long, while a compact script would be no larger than 1148.

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 |
|---------------------|------------|
| 2388 bytes or more  | 0%         |
| 1768 – 2387 bytes   | 5%         |
| 1149 – 1767 bytes   | 15%        |
| 976 – 1148 bytes    | 25%        |
| less than 976 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 **lp**, who is a member of the **voice** group, **read from** the file `/zerfahrt/gerennt/einwitztete`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x-----      lp      uucp      0 zerfahrt
│
├─ (2)      d-wx-wxr-x      proxy     fax      0 gerennt
│
└─ (3)      -r--rw-----      uucp     voice     0 einwitztete
```

## 5.2

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

```

/
├─ (1)      d-wxr--r-x      nobody   student    0 ausgetritts
│
├─ (2)      d-w----rwX      news      voice      0 berabarbse
│
└─ (3)      --w-rwxrwx      news      voice      0 angehtete
```

## 5.3

Can the user **mail**, who is a member of the **audio** group, **execute** the file `/angesprachse/besinner/zerhaltse`? If not, which of the three directories blocks access (Y|1|2|3)



```

/
├─ (1)      drwxrwxrwx      lp      audio      0 angesprachse
│   └─ (2)      drwxr-xr-x    nobody    audio      0 besinner
│       └─ (3) -r--rw---x      lp        dip        0 zerhaltse

```

#### 5.4

Can the user **news**, who is a member of the **mail** group, **write to** the file **/verlauftete/aufklettt/aufgewarftete**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drw-r-xrw-      mail      mail      0 verlauftete
│   └─ (2)      d---rwx-wx    uucp      mail      0 aufklettt
│       └─ (3) -rwxrwx--x    student    mail      0 aufgewarftete

```

#### 5.5

Can the user **mail**, who is a member of the **fax** group, **execute** the file **/eintrause/aufrababung/enfahrtheit**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x-w-rwx      nobody    audio      0 eintrause
│   └─ (2)      d---rwxr-x    nobody      fax      0 aufrababung
│       └─ (3) -rw--wxr-x      uucp      audio      0 enfahrtheit

```

#### 5.6

Can the user **mail**, who is a member of the **voice** group, **read from** the file **/aufrennt/ausgesitzte/aufgehundheit**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwxrw-r-x      student    uucp      0 aufrennt
│   └─ (2)      dr-x-----x    mail      cdrom      0 ausgesitzte
│       └─ (3) -rw---xr--      student    uucp      0 aufgehundheit

```

## 5.7

Can the user **lp**, who is a member of the **floppy** group, **write to** the file **/besitzst/angepflumse/verpflumkeit**? If not, which of the three directories blocks access (Y|1|2|3)

|        |            |       |        |   |              |
|--------|------------|-------|--------|---|--------------|
| /      |            |       |        |   |              |
| └─ (1) | dr--rwxr-- | proxy | floppy | 0 | besitzst     |
| └─ (2) | drwxrw-rwx | lp    | voice  | 0 | angepflumse  |
| └─ (3) | ---xrwx--- | lp    | tape   | 0 | verpflumkeit |

## 5.8

Can the user **proxy**, who is a member of the **floppy** group, **write to** the file **/enhalter/angewarfung/entraukeit**? If not, which of the three directories blocks access (Y|1|2|3)

|        |            |        |        |   |             |
|--------|------------|--------|--------|---|-------------|
| /      |            |        |        |   |             |
| └─ (1) | drwxrwxrw- | proxy  | cdrom  | 0 | enhalter    |
| └─ (2) | drwx----w- | nobody | floppy | 0 | angewarfung |
| └─ (3) | ---xrwx-w- | news   | floppy | 0 | entraukeit  |

## 5.9

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

|        |            |       |        |   |              |
|--------|------------|-------|--------|---|--------------|
| /      |            |       |        |   |              |
| └─ (1) | drwxrwxrwx | uucp  | floppy | 0 | angestehkeit |
| └─ (2) | dr-x-wx--x | uucp  | audio  | 0 | gewarfheit   |
| └─ (3) | -r-xrwx--x | proxy | floppy | 0 | angekaestete |

## 5.10

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

```

/
├─ (1)      drwxrwx-w-   mail    tape    0 enrennst
│   └─ (2)      drwx-----x  nobody  mail    0 angetrause
│       └─ (3)  ---x-wx-wx   proxy   mail    0 verklettheit

```

### 5.11

Can the user **proxy**, who is a member of the **dip** group, **execute** the file **/austrittte/angerennheit/angeschmeckte**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-wx-w-r-x    lp      tape    0 austrittte
│   └─ (2)      d--x---r-x  student proxy    0 angerennheit
│       └─ (3)  --w-r--rwx   proxy   voice    0 angeschmeckte

```

### 5.12

Can the user **games**, who is a member of the **audio** group, **read from** the file **/berauchte/ausrennkeit/gerauchse**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-xrw-----  games   proxy    0 berauchte
│   └─ (2)      drwxr-x---  nobody   audio    0 ausrennkeit
│       └─ (3)  -----xrw-  proxy    fax      0 gerauchse

```

### 5.13

Can the user **student**, who is a member of the **floppy** group, **read from** the file **/vergehist/einrauchte/zerrrauchheit**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwx-wxrwx     lp      proxy    0 vergehist
│   └─ (2)      d-wxrwx-wx  uucp   floppy    0 einrauchte
│       └─ (3)  -r--rw-r-x  student floppy    0 zerrrauchheit

```

### 5.14

Can the user **lp**, who is a member of the **student** group, **execute** the file **/einkaess/behundkeit/angerennung**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-xr-xr-x      uucp  student    0 einkaess
│   └─ (2)  drw-r-xrw-     nobody student    0 behundkeit
│       └─ (3) -----wxr--      lp    tape      0 angerennung

```

### 5.15

Can the user **mail**, who is a member of the **student** group, **read from** the file **/vergehtest/zerrauchen/anritter**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-wxrwx---      uucp  student    0 vergehtest
│   └─ (2)  d---rw-r-x      nobody  tape      0 zerrauchen
│       └─ (3) -rw-xwxr-x      news  floppy    0 anritter

```

### 5.16

Can the user **lp**, who is a member of the **news** group, **write to** the file **/entrautest/ensetzst/aufgeschmeckst**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-w-rwx--x      games   news      0 entrautest
│   └─ (2)  dr-x-wxr-x      proxy   mail      0 ensetzst
│       └─ (3) ---x-w-rw-      lp      dip      0 aufgeschmeckst

```

### 5.17

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

```

/
├─ (1)      dr--r-x---  games    audio    0 verklettheit
│   └─ (2)      drwxr--rw-   news      tape     0 ausgehaltkeit
│       └─ (3)      ----rwx--- student   voice    0 ankraust

```

### 5.18

Can the user **student**, who is a member of the **audio** group, **execute** the file `/aufgeraucher/aufgehundte/besteht`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwxr-xr--  student   uucp     0 aufgeraucher
│   └─ (2)      dr-x-w--w-  student   fax      0 aufgehundte
│       └─ (3)      -r-xrw-r-- student   fax      0 besteht

```

### 5.19

Can the user **games**, who is a member of the **tape** group, **write to** the file `/aufgetrittheit/aufkaestest/enrabarbheit`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x-wxrw-  nobody    mail     0 aufgetrittheit
│   └─ (2)      drwx--x-w-   games     tape     0 aufkaestest
│       └─ (3)      ----rw-rw-  games     voice    0 enrabarbheit

```

### 5.20

Can the user **nobody**, who is a member of the **tape** group, **execute** the file `/auspflumte/einklettte/ankrauer`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x-w----  nobody    news     0 auspflumte
│   └─ (2)      dr-xrw--wx  nobody    voice    0 einklettte
│       └─ (3)      --wx-wxr-- nobody    floppy   0 ankrauer

```

## 5.21

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

```

/
├─ (1)      dr-x-w-rwx      mail      tape      0 zerklettkeit
│
│   └─ (2)   d--xrwxr-x      mail      audio      0 besinnst
│
│       └─ (3) --w-rwx--x      news      tape      0 aushaltst
```

## 5.22

Can the user **mail**, who is a member of the **fax** group, **read from** the file **/anfahren/angekraus/aufgekrautest**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr--rwxrwx      uucp      fax      0 anfahren
│
│   └─ (2)   drw----rwx      lp      fax      0 angekraus
│
│       └─ (3) -r--r--rwx      mail      audio      0 aufgekrautest
```

## 5.23

Can the user **student**, who is a member of the **news** group, **execute** the file **/zerhaltheit/anrauchung/aufhalter**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwx-w-r-x      proxy      tape      0 zerhaltheit
│
│   └─ (2)   dr-xrw-rwx      nobody     floppy     0 anrauchung
│
│       └─ (3) --wxrwx--x      mail      voice      0 aufhalter
```

## 5.24

Can the user **mail**, who is a member of the **news** group, **execute** the file **/besprachkeit/ausgesprachtst/gepflumer**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d--xr-x-w-   games    dip    0 besprachkeit
│   └─ (2)      dr-x-----x   mail    cdrom  0 ausgesprachtest
│       └─ (3) -rwx---r--   mail    cdrom  0 gepflumer

```

## 5.25

Can the user **nobody**, who is a member of the **floppy** group, **write to** the file **/auftritttheit/einrauchtest/engehen**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwx--xrwx    uucp    cdrom  0 auftritttheit
│   └─ (2)      drwxrwxr-- proxy floppy 0 einrauchtest
│       └─ (3) -rwx--xrwx    uucp    uucp  0 engehen

```

## 5.26

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

```

/
├─ (1)      d---rw-rwx    games    audio  0 enwitztheit
│   └─ (2)      d---rwx---    lp      dip    0 berennt
│       └─ (3) ---xr-xrwx student proxy  0 verschmecktheit

```

## 5.27

Can the user **news**, who is a member of the **proxy** group, **execute** the file **/eintrittse/einhaltse/gefahrtete**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwxr--rw-    news     voice  0 eintrittse
│   └─ (2)      d--xrwxr-x uucp    proxy  0 einhaltse
│       └─ (3) -r--r---wx  news     dip    0 gefahrtete

```

## 5.28

Can the user **student**, who is a member of the **dip** group, **execute** the file `/ausgeklettete/gepflumung/ankrauen`? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      dr-xr-x-w-   mail      dip      0   ausgeklettete
│
│   └─ (2)   drwxrwxr-x   student   mail      0   gepflumung
│
│       └─ (3) -rw-rwxr--   news      dip      0   ankrauen
```

## 5.29

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

```
/
├─ (1)      drwx---r-x    uucp      floppy    0   auftrautete
│
│   └─ (2)   d---rwxrwx    news      uucp      0   zerwarfs
│
│       └─ (3) ----rwx-wx   news      news      0   besprachen
```

## 5.30

Can the user **nobody**, who is a member of the **voice** group, **execute** the file `/angestehts/betrittst/zerhalten`? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      dr-x--xrw-    nobody     uucp      0   angestehts
│
│   └─ (2)   d--x-w-r-x    news      voice     0   betrittst
│
│       └─ (3) -----r-x   mail      floppy    0   zerhalten
```

## 5.31

Can the user **nobody**, who is a member of the **uucp** group, **read from** the file `/aufgesetzung/ausgewitzst/einwarfstest`? If not, which of the three directories blocks access (Y|1|2|3)



```

/
├─ (1)      d-wxrwx-w-      uucp      uucp      0 aufgesetzung
│
├─ (2)      dr-----r-x    student    uucp      0 ausgewitzst
│
└─ (3)      --wxr-xrwx      games      uucp      0 einwarftest

```

### 5.32

Can the user **nobody**, who is a member of the **student** group, **execute** the file **/verfahrte/verkatztete/aufgefahrung**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwx----w-      proxy      cdrom      0 verfahrte
│
├─ (2)      drw-rwxrwx      games      student    0 verkatztete
│
└─ (3)      -rwx-wx-wx      nobody      fax        0 aufgefahrung

```

### 5.33

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

```

/
├─ (1)      drwxrw-r-x      proxy      news        0 bewitztete
│
├─ (2)      dr-x--xr-x      lp        uucp        0 ankaeser
│
└─ (3)      --wx-w-rwx      student    voice        0 belaufse

```

### 5.34

Can the user **mail**, who is a member of the **news** group, **write to** the file **/eingeht/verrennst/aufrauchtest**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwxr----x      mail      dip        0 eingeht
│
├─ (2)      d---r--r-x      nobody    uucp        0 verrennst
│
└─ (3)      --wx-wxr--      news      news        0 aufrauchtest

```

### 5.35

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

|        |            |        |         |   |             |
|--------|------------|--------|---------|---|-------------|
| /      |            |        |         |   |             |
| └─ (1) | d-wxr-xrwx | nobody | student | 0 | enwarfheit  |
| └─ (2) | d--xr-xrw- | games  | student | 0 | einsetztete |
| └─ (3) | --wxrw--x  | lp     | dip     | 0 | ausstehtete |

### 5.36

Can the user **games**, who is a member of the **news** group, **execute** the file **/auftrittung/getraus/zerhundung**? If not, which of the three directories blocks access (Y|1|2|3)

|        |             |        |      |   |             |
|--------|-------------|--------|------|---|-------------|
| /      |             |        |      |   |             |
| └─ (1) | d---r-x---  | uucp   | uucp | 0 | auftrittung |
| └─ (2) | dr-xr-xrwx  | news   | news | 0 | getraus     |
| └─ (3) | -rw-x-w--wx | nobody | tape | 0 | zerhundung  |

### 5.37

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

|        |            |       |       |   |            |
|--------|------------|-------|-------|---|------------|
| /      |            |       |       |   |            |
| └─ (1) | d-wxrwxr-- | news  | proxy | 0 | verkaest   |
| └─ (2) | d-w----r-- | proxy | proxy | 0 | angesitzen |
| └─ (3) | --wxr--rw- | proxy | audio | 0 | angeraucht |

### 5.38

Can the user **mail**, who is a member of the **fax** group, **read from** the file **/aufrennst/auslaufte/aufrabarbt**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwx-wx-w-   news   audio   0 aufrennst
│   └─ (2)      drw-rwxrwx   uucp     fax     0 auslaufte
│       └─ (3)  -r-x-w--wx   mail     mail    0 aufrabarbt

```

### 5.39

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

```

/
├─ (1)      d--xrwxr-x   student   voice   0 aufraucht
│   └─ (2)      d-----xrw   uucp     proxy    0 angetrauer
│       └─ (3)  -rwx-----w-   news     audio   0 auswitzheit

```

### 5.40

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

```

/
├─ (1)      drw-r-xrw-    lp        mail    0 ausgekaesen
│   └─ (2)      dr-xrwxrwx student   mail    0 auswitzung
│       └─ (3)  --wx---r-x   mail     voice   0 auskatzet

```

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

dc3ae917ca13755b1b7c0950470f0b392e9ee87e04a9845b9a9776a03a6167b6

You can check your result with a command like:

```
echo -n "2YY13YY2YYYY3YY2Y22YY11Y2Y1YY2YYY3Y3YY" | \
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.