

# 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-exercise1.tgz`

1. `anfahrs`, mode `-----rw-`
2. `angesprochen`, mode `r---wxrw-`
3. `angestehte`, mode `---rw----`
4. `angegehse`, mode `-w-rwx-w-`
5. `belaufheit`, mode `rwx-----`
6. `aufwarfheit`, mode `r-x-wx---`
7. `ensitzung`, mode `-w--wx---`
8. `angekraust`, mode `r---wxrw-`
9. `angestehte/ansetzer`, mode `-w--wx-w-`
10. `angegehse/engehheit`, mode `--x--x-wx`
11. `aufwarfheit/auftrauer`, mode `r-x--x--x`
12. `anfahrs/ansprachte`, mode `-wx-w--wx`
13. `ensitzung/ensitzen`, mode `--xr-xr--`
14. `anfahrs/ansprachte/aufkraueheit`, mode `r--r-x--x`
15. `ensitzung/ensitzen/behaltst`, mode `-wx---r--`
16. `ensitzung/ensitzen/enkatzetest`, mode `--x-wx--x`
17. `angestehte/ansetzer/angegehse`, mode `r--r-xrwx`
18. `anfahrs/ansprachte/bewarfte`, mode `r--rwx-w-`
19. `aufwarfheit/auftrauer/enkaesst`, mode `-wxr-x-w-`
20. `angegehse/engehheit/einlaufte`, mode `r--r--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 2334 bytes long, while a compact script would be no larger than 942.

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 |
|---------------------|------------|
| 2335 bytes or more  | 0%         |
| 1639 – 2334 bytes   | 5%         |
| 943 – 1638 bytes    | 15%        |
| 801 – 942 bytes     | 25%        |
| less than 801 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-solution1638.sh unit1-solution650059687.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-exercise2.tgz`

1. `anlaufst`, mode `--xr-xr--`, owner `uucp`, group `tape`
2. `anpflumst`, mode `----wx--x`, owner `lp`, group `mail`
3. `bekatzezeit`, mode `rw---x-w-`, owner `news`, group `cdrom`
4. `einkletten`, mode `-w--w-r--`, owner `uucp`, group `uucp`
5. `zersitzzeit`, mode `r-x-wrwx`, owner `news`, group `audio`
6. `angerauchst`, mode `-w--wx-w-`, owner `nobody`, group `mail`

7. verrenner, mode --x-w---x, owner uucp, group dip
8. angehaltkeit, mode -w-r---wx, owner games, group student
9. bekatzekheit/angehkeit, mode --xr--r-x, owner lp, group voice
10. bekatzekheit/angehunden, mode --xrw-r--, owner nobody, group proxy
11. anpflumst/aufsinnte, mode rwx--xr-x, owner proxy, group proxy
12. angerauchst/angehalten, mode r-xr-----, owner uucp, group uucp
13. bekatzekheit/betritttete, mode -w-----, owner student, group mail
14. anpflumst/aufsinnte/aufwarfst, mode -wxrwxr--, owner news, group proxy
15. bekatzekheit/angehkeit/auspflumer, mode --x---r--, owner mail, group mail
16. bekatzekheit/betritttete/angesteher, mode r--rw--w-, owner student, group proxy
17. angerauchst/angehalten/angeraucher, mode -wxr-x-w-, owner games, group voice
18. bekatzekheit/betritttete/verschmecken, mode -wx-w-rwx, owner games, group fax
19. angerauchst/angehalten/ausgetraung, mode r-xrw--wx, owner mail, group student
20. bekatzekheit/angehunden/versinnkeit, mode r---w-r-x, owner games, 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 2379 bytes long, while a compact script would be no larger than 1206.

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 |
|----------------------|------------|
| 2380 bytes or more   | 0%         |
| 1793 – 2379 bytes    | 5%         |
| 1207 – 1792 bytes    | 15%        |
| 1026 – 1206 bytes    | 25%        |
| less than 1026 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-solution1792.sh unit1-solution650059687.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-exercise3.tgz`

1. `aufgestehheit`, mode `---wxrw-`, owner `proxy`, group `audio`
2. `angetraut`, mode `-w-rw--wx`, owner `nobody`, group `audio`
3. `geschmecktest`, mode `--x-w-r-x`, owner `news`, group `fax`
4. `bewarfen`, mode `--xrw---x`, owner `nobody`, group `uucp`, `setuid`
5. `ansinntete`, mode `-w--w-r-x`, owner `nobody`, group `news`
6. `auftrittung`, mode `rwX--x---`, owner `lp`, group `proxy`
7. `verrennheit`, mode `-w-r-xr--`, owner `news`, group `fax`
8. `ausgehs`, mode `-wxrwxrw-`, owner `news`, group `uucp`
9. `verrennheit/ausgetraust`, mode `r-xr--r--`, owner `uucp`, group `voice`
10. `geschmecktest/ausgehaltung`, mode `-----xrwX`, owner `mail`, group `floppy`, `setuid`
11. `auftrittung/angehundung`, mode `-wxrwxrwX`, owner `nobody`, group `proxy`
12. `bewarfen/gesinnen`, mode `r---w-rwX`, owner `student`, group `uucp`, `setuid`

13. `bearfen/aufsprachtest`, mode `rwX-wXrwX`, owner `proxy`, group `proxy`
14. `bearfen/gesinnen/einfahrttest`, mode `---rwXrw-`, owner `nobody`, group `cdrom`, `setuid`
15. `bearfen/aufsprachtest/aufgekaest`, mode `---r-X-wX`, owner `games`, group `tape`, `setuid`
16. `geschmecktest/ausgehaltung/behalttheit`, mode `-wX-w-rw-`, owner `uucp`, group `proxy`, `setuid`
17. `auftrittung/angehungung/einhalttest`, mode `--XrwXr-X`, owner `student`, group `news`
18. `geschmecktest/ausgehaltung/verkrautete`, mode `rw--wX--X`, owner `uucp`, group `tape`, `setuid`
19. `bearfen/gesinnen/aufkaestete`, mode `-wX-w--w-`, owner `nobody`, group `dip`, `setuid`
20. `auftrittung/angehungung/verhunds`, mode `r-Xr--r-X`, owner `student`, group `proxy`, `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 2408 bytes long, while a compact script would be no larger than 1244.

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 |
|----------------------|------------|
| 2409 bytes or more   | 0%         |
| 1827 – 2408 bytes    | 5%         |
| 1245 – 1826 bytes    | 15%        |
| 1058 – 1244 bytes    | 25%        |
| less than 1058 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-solution1826.sh unit1-solution650059687.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-exercise4.tgz`

1. `bekatzetest`, mode `--xr-xrwx`, group `fax`, `setgid`
2. `auskatzete`, mode `-----x`, group `dip`
3. `ausgehundtest`, mode `rw-x-w-rw-`, group `cdrom`
4. `einkletttete`, mode `-wxr----x`, group `fax`, `setgid`
5. `angefahrung`, mode `--xr----x`, group `cdrom`, `setgid`
6. `ausgehaltse`, mode `---r--rwx`, group `mail`, `setgid`
7. `gerabarbst`, mode `-w-r--rwx`, group `voice`, `setgid`
8. `angesitzte`, mode `rw--wx---`, group `tape`, `setgid`
9. `angefahrung/gerenntete`, mode `r-x-wx--x`, group `tape`
10. `auskatzete/aufstehen`, mode `----w---x`, group `mail`
11. `ausgehaltse/zersitzen`, mode `rw-rwxr-w-`, group `voice`
12. `ausgehundtest/eingehtete`, mode `r---wxrwx`, group `news`
13. `auskatzete/aussetzs`, mode `--xr---w-`, group `audio`, `setgid`
14. `ausgehaltse/zersitzen/gehundtest`, mode `--xrwx-w-`, group `news`
15. `auskatzete/aussetzs/einlaufung`, mode `--xrwx-wx`, group `audio`
16. `ausgehaltse/zersitzen/ausgesinns`, mode `----w-rw-`, group `tape`, `setgid`
17. `auskatzete/aufstehen/auswurfkeit`, mode `-wx-wxr-x`, group `fax`, `setgid`
18. `auskatzete/aufstehen/ensetzkeit`, mode `---rwx--x`, group `tape`
19. `angefahrung/gerenntete/enhundtest`, mode `r-xr-xrw-`, group `tape`, `setgid`

20. `ausgehundertest/eingehtete/enkletttheit`, mode `rw--w-r--`, group `proxy`

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 2421 bytes long, while a compact script would be no larger than 1101.

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 |
|---------------------|------------|
| 2422 bytes or more  | 0%         |
| 1762 – 2421 bytes   | 5%         |
| 1102 – 1761 bytes   | 15%        |
| 936 – 1101 bytes    | 25%        |
| less than 936 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-solution1761.sh unit1-solution650059687.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, **execute** the file `/angerabarber/enlaufer/ausgerabarbarkeit`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drw--w-r-x    news      fax      0 angerabarber
    │
    └─ (2)    d---rwx-wx   student    voice    0 enlaufer
        │
        └─ (3) --wx--x---   proxy      voice    0 ausgerabarbarkeit

```

## 5.2

Can the user **news**, who is a member of the **student** group, **read from** the file `/ensprachse/verkletttest/angekatzetete`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-wxr-xr-x    proxy    student    0 ensprachse
    │
    └─ (2)    drwx-w-r--    news      news      0 verkletttest
        │
        └─ (3) -rwxr--r-x    uucp      audio     0 angekatzetete

```

## 5.3

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

```

/
├─ (1)      d-wx-w-r-x    games     audio     0 besprachse
    │
    └─ (2)    d----w-r-x    lp        proxy     0 entrautete
        │
        └─ (3) -rwx--xr-x    lp        student  0 verfahrse

```



## 5.4

Can the user **uucp**, who is a member of the **floppy** group, **write to** the file **/ausstehung/versprachte/bekletttest**? If not, which of the three directories blocks access (Y|1|2|3)

|        |            |       |        |   |             |
|--------|------------|-------|--------|---|-------------|
| /      |            |       |        |   |             |
| └─ (1) | drwx-wxr-x | uucp  | proxy  | 0 | ausstehung  |
| └─ (2) | drwxrwx--x | games | floppy | 0 | versprachte |
| └─ (3) | ---x-w-rw- | uucp  | uucp   | 0 | bekletttest |

## 5.5

Can the user **news**, who is a member of the **uucp** group, **write to** the file **/verlaufheit/auslaufetest/aussprachheit**? If not, which of the three directories blocks access (Y|1|2|3)

|        |            |       |       |   |               |
|--------|------------|-------|-------|---|---------------|
| /      |            |       |       |   |               |
| └─ (1) | drw--wxr-x | games | proxy | 0 | verlaufheit   |
| └─ (2) | dr--rwx-wx | lp    | uucp  | 0 | auslaufetest  |
| └─ (3) | --w----rw- | news  | uucp  | 0 | aussprachheit |

## 5.6

Can the user **nobody**, who is a member of the **cdrom** group, **read from** the file **/ausgerauchung/zerrabarbttest/einkaeskeit**? If not, which of the three directories blocks access (Y|1|2|3)

|        |            |        |         |   |                |
|--------|------------|--------|---------|---|----------------|
| /      |            |        |         |   |                |
| └─ (1) | dr-xrw-rwx | nobody | student | 0 | ausgerauchung  |
| └─ (2) | d--x-----  | lp     | cdrom   | 0 | zerrabarbttest |
| └─ (3) | -rw-r----x | proxy  | cdrom   | 0 | einkaeskeit    |

## 5.7

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

```

/
├─ (1)      drwx-w----  nobody    mail    0 zerpflumtest
│   └─ (2)      d---rwxrw-   uucp      fax    0 einwurfheit
│       └─ (3)    -r---w-rwx   news      uucp    0 angesinntest

```

## 5.8

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

```

/
├─ (1)      dr-xr-x-w-   news     mail    0 ausschmeckst
│   └─ (2)      dr-x---r--   lp  student  0 betritttest
│       └─ (3)    --w-rwx--x   lp  student  0 angefahrer

```

## 5.9

Can the user **lp**, who is a member of the **fax** group, **execute** the file **/aufgeschmecktest/einkatzeung/ankaes**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drw-r-xrw-   mail     fax    0 aufgeschmecktest
│   └─ (2)      d---rwxr-x   uucp     tape   0 einkatzeung
│       └─ (3)    -rw---x--x   lp  student  0 ankaeste

```

## 5.10

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

```

/
├─ (1)      dr-x--xr--   student   uucp    0 versitzse
│   └─ (2)      drwx-w-r-x   games     tape   0 angelaufener
│       └─ (3)    ----rwx---   student   voice   0 enstehtete

```

## 5.11

Can the user **news**, who is a member of the **fax** group, **read from** the file **/aufgerenntheit/zertrittst/ausgerabarber**? If not, which of the three di-

directories blocks access (Y|1|2|3)

```

/
└─ (1)      d---rwxrwx      lp      audio      0 aufgerennheit
    └─ (2)      d--x--xr-x      proxy      dip      0 zertrittst
        └─ (3)      ---xr-xrwx      news      student      0 ausgerabarber

```

## 5.12

Can the user **news**, who is a member of the **student** group, **read from** the file **/zerhundertete/besetzttest/aufkaesung**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
└─ (1)      d-w--wxr-x      nobody      audio      0 zerhundertete
    └─ (2)      dr-xrwx-w-      nobody      student      0 besetzttest
        └─ (3)      -r-x-wxr--      news      proxy      0 aufkaesung

```

## 5.13

Can the user **nobody**, who is a member of the **fax** group, **execute** the file **/einklettse/aufgrabbarkeit/zersinns**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
└─ (1)      d--x-wxr-x      mail      mail      0 einklettse
    └─ (2)      dr--r-x--x      games      fax      0 aufrabarbarkeit
        └─ (3)      -r--rwx-w-      nobody      proxy      0 zersinns

```

## 5.14

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

```

/
└─ (1)      drwx-w-----      proxy      fax      0 einkaestest
    └─ (2)      drwxr--rw-      mail      student      0 aufsteht
        └─ (3)      -rw-r-x--x      mail      audio      0 angekletttest

```

### 5.15

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

```
/
├─ (1)      drwx--xrw-    uucp    audio    0 angehaltung
│   └─ (2)   dr--rwx---    proxy   student  0 angesitzung
│       └─ (3) -r-xrwxrw-    uucp    cdrom    0 zerrabarbst
```

### 5.16

Can the user **news**, who is a member of the **tape** group, **write to** the file **/angekaesung/besetzt/auflauft**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      dr-x-wx-w-    proxy    fax    0 angekaesung
│   └─ (2)   dr-xr-xrw-    news     uucp    0 besetzt
│       └─ (3) -rw-----    news     proxy    0 auflauft
```

### 5.17

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

```
/
├─ (1)      d-w-r-x--x    games   student  0 angesitzs
│   └─ (2)   d-wx-wxr-x    uucp     dip    0 anlaufte
│       └─ (3) --wx-wx-w-    mail     floppy  0 ensteher
```

### 5.18

Can the user **mail**, who is a member of the **news** group, **read from** the file **/gepflumse/gesetzse/ausrenntest**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr--r-x--x    news    news    0 gepflumse
│   └─ (2)      dr-xr-xrw-    mail    floppy    0 gesetzse
│       └─ (3)  -r---wxrw-    mail     tape    0 ausrenntest

```

### 5.19

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

```

/
├─ (1)      dr-x-wx--x    student    voice    0 zerhaltung
│   └─ (2)      drw-rwxr--    proxy    student    0 ausfahrt
│       └─ (3)  ----rw-r--    nobody    student    0 einsitzse

```

### 5.20

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

```

/
├─ (1)      dr-x-w-rwx      lp     audio    0 enkraus
│   └─ (2)      d-wxr--r-x    proxy    mail     0 angelaufung
│       └─ (3)  -rw-r-xr-x    mail     dip     0 gesitzs

```

### 5.21

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

```

/
├─ (1)      drwx---r-x      uucp     audio    0 enkrauen
│   └─ (2)      d-w---xrwx    student    mail     0 ansetztest
│       └─ (3)  -----w-rw-    mail     news     0 bekraust

```

## 5.22

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

```
/
├─ (1)      d-wx---rwx    games    uucp    0 einsprachtest
│   └─ (2)   drwx-w-r-x   student   mail    0 entstehst
│       └─ (3) ---x-wx-w-    uucp     dip    0 angehaltheit
```

## 5.23

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

```
/
├─ (1)      drwxrwxrw-    nobody    uucp    0 gerabarbtete
│   └─ (2)   d-wx--xr-x    proxy     news    0 betrittung
│       └─ (3) -r-xrwx--x   nobody     uucp    0 auswitzung
```

## 5.24

Can the user **uucp**, who is a member of the **news** group, **write to** the file **/versprachheit/enhaltkeit/gesinnt**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      d--x----w-    nobody    tape    0 versprachheit
│   └─ (2)   drwxr-xr-x    uucp     news    0 haltkeit
│       └─ (3) --w--wx--x   uucp     tape    0 gesinnt
```

## 5.25

Can the user **nobody**, who is a member of the **proxy** group, **write to** the file **/angehundse/ausgesetzt/enfahrer**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwxr-x-w-  student  proxy    0  angehundse
│
│   └─ (2)      dr-x----w-  student  proxy    0  ausgesetzt
│       │
│       └─ (3)  --w-rwxrw-    lp      cdrom    0  enfahrer

```

## 5.26

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

```

/
├─ (1)      drwx-wx-w-    news     news     0  angekaeskeit
│
│   └─ (2)      dr-xr--rw-  nobody   mail     0  auskrause
│       │
│       └─ (3)  ---xrwx-w-  nobody   mail     0  entrittte

```

## 5.27

Can the user **nobody**, who is a member of the **dip** group, **write to** the file **/angetrittttest/besinnte/auskrautete**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x-w-rwx    nobody    fax      0  angetrittttest
│
│   └─ (2)      drw-rw-r-x  student  audio    0  besinnte
│       │
│       └─ (3)  --wxrw--w-    lp      dip      0  auskrautete

```

## 5.28

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

```

/
├─ (1)      drwxr-xrwx      lp      proxy    0  einlaufer
│
│   └─ (2)      drwx-w-rwx  student  news     0  aufgesinnse
│       │
│       └─ (3)  -----wx-w-  student  cdrom    0  eingeher

```

### 5.29

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

```

/
├─ (1)      dr-xrwx---      uucp   floppy   0  ausfahrte
│
│   └─ (2)   dr--r-xrw-     nobody  cdrom    0  einrabarbte
│
│       └─ (3) -rw--xrw-      mail   student  0  bewitzheit
```

### 5.30

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

```

/
├─ (1)      d--xr-x---      uucp   student   0  aussprachse
│
│   └─ (2)   drwxrw-r--      lp      fax       0  bepflumse
│
│       └─ (3) --w--w-r-x      lp      dip       0  enlaufs
```

### 5.31

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

```

/
├─ (1)      dr--rwx-w-      games   floppy   0  ausgeklettst
│
│   └─ (2)   drwx-w--wx      uucp     fax       0  aufsetzs
│
│       └─ (3) ----rw---x    mail     tape     0  versitzer
```

### 5.32

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



```

/
├─ (1)      drwxrwx-w-  student  audio    0 angesetzkeit
│
│   └─ (2)   d--xrwx-w-    lp      mail     0 einkrautest
│       │
│       └─ (3) -rw-----wx    mail    audio    0 anwarftest

```

### 5.33

Can the user **uucp**, who is a member of the **audio** group, **write to** the file **/gesitzer/aushundse/ausgekaestete**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-w-r-xrwx    lp      proxy     0 gesitzer
│
│   └─ (2)   d-wxr-x-wx    mail    audio     0 aushundse
│       │
│       └─ (3) -r-xrwx-wx    proxy   audio     0 ausgekaestete

```

### 5.34

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

```

/
├─ (1)      d---r-x---    nobody   audio     0 einsinnse
│
│   └─ (2)   d-wxrwxr-x    lp      proxy     0 einpflumse
│       │
│       └─ (3) -rwxr-x-w-    uucp    proxy     0 gewarfs

```

### 5.35

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

```

/
├─ (1)      d--xrwxr--    student  proxy     0 austrautete
│
│   └─ (2)   dr--rwxrwx    proxy    proxy     0 zersprachst
│       │
│       └─ (3) --wxrw-rwx    mail     uucp     0 verpflumt

```

### 5.36

Can the user **games**, who is a member of the **floppy** group, **read from** the file **/bekrauen/engeht/enlaufte**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drwxr-x---   games    fax      0 bekrauen
│   └─ (2)   dr-xr-x-wx  student  floppy   0 engeht
│       └─ (3) --wx--xr-x   proxy    uucp     0 enlaufte
```

### 5.37

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

```
/
├─ (1)      drwxr--rwx  student   tape     0 ausgeschmeckheit
│   └─ (2)   d---r-x---   uucp      proxy    0 zerwarfst
│       └─ (3) --wxrw-rwx    lp       audio   0 verrauchkeit
```

### 5.38

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

```
/
├─ (1)      drwxrwx-w-   nobody    proxy    0 beschmeckkeit
│   └─ (2)   d-wx-w-rwx   uucp      proxy    0 versprachse
│       └─ (3) ---xrwxr-x    lp       proxy    0 ansteher
```

### 5.39

Can the user **lp**, who is a member of the **proxy** group, **write to** the file **/verrabarbkeit/zersetzst/behundkeit**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-----      games      cdrom      0 verrabarkeit
│   └─ (2)  d-w-r-xr-x    news        cdrom      0 zersetzst
│       └─ (3) -rwxr-xrw-    lp          audio      0 behundkeit

```

## 5.40

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

```

/
├─ (1)      dr-xrwxr-x    news        news        0 einrennung
│   └─ (2)  drw---xr-x    mail         voice        0 angelaufs
│       └─ (3) --wxrw--w-  mail         audio        0 beschmeckt

```

## Hash for checking if you have all 40 correct

d2635936800238cc950c2c9c2acf9e6d2d8340133da4633ba6a70e4ff0c54b47

You can check your result with a command like:

```
echo "2YY13YY2YYYYY3Y3YY2Y22YY11Y2Y1YY2YYYY3Y3YY" | \
    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.