

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 `unit1exercise1.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 2333 bytes long, while a compact script would be no larger than 941.

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
2334 bytes or more	0%
1638 – 2333 bytes	5%
942 – 1637 bytes	15%
800 – 941 bytes	25%
less than 800 bytes	40%

To test your solution, use a command like:

```
./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 unit1exercise1.tgz unit1exercise1
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 `unit1exercise2.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. bekatzekeit/angehkeit, mode --xr--r-x, owner lp, group voice
10. bekatzekeit/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. bekatzekeit/betritttete, mode -w-----, owner student, group mail
14. anpflumst/aufsinnte/aufwarfst, mode -wxrwxr--, owner news, group proxy
15. bekatzekeit/angehkeit/auspflumer, mode --x---r--, owner mail, group mail
16. bekatzekeit/betritttete/angesteher, mode r--rw--w-, owner student, group proxy
17. angerauchst/angehalten/angeraucher, mode -wxr-x-w-, owner games, group voice
18. bekatzekeit/betritttete/verschmecken, mode -wx-w-rwx, owner games, group fax
19. angerauchst/angehalten/ausgetrauung, mode r-xrw--wx, owner mail, group student
20. bekatzekeit/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 2378 bytes long, while a compact script would be no larger than 1205.

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
2379 bytes or more	0%
1792 – 2378 bytes	5%
1206 – 1791 bytes	15%
1025 – 1205 bytes	25%
less than 1025 bytes	40%

To test your solution, use a command like:

```
./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 unit1exercise2.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 `unit1exercise3.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. `bewarfen/aufsprachtest`, mode `rwX-wxrwX`, owner `proxy`, group `proxy`

14. `bewarfen/gesinnen/einfahrttest`, mode `---rwxrw-`, owner `nobody`, group `cdrom`, `setuid`
15. `bewarfen/aufsprachtest/aufgekaest`, mode `---r-x-wx`, owner `games`, group `tape`, `setuid`
16. `geschmecktest/ausgehaltung/behaltheit`, mode `-wx-w-rw-`, owner `uucp`, group `proxy`, `setuid`
17. `auftrittung/angehundung/einhalttest`, mode `--xrw-r-x`, owner `student`, group `news`
18. `geschmecktest/ausgehaltung/verkrautete`, mode `rw--wx--x`, owner `uucp`, group `tape`, `setuid`
19. `bewarfen/gesinnen/aufkaestete`, mode `-wx-w--w-`, owner `nobody`, group `dip`, `setuid`
20. `auftrittung/angehundung/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 2407 bytes long, while a compact script would be no larger than 1243.

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
2408 bytes or more	0%
1826 – 2407 bytes	5%
1244 – 1825 bytes	15%
1057 – 1243 bytes	25%
less than 1057 bytes	40%

To test your solution, use a command like:

```
./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 unit1exercise3.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 `unit1exercise4.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 `--xrw-x-w-`, group `news`
15. `auskatzete/aussetzs/einlaufung`, mode `--xrw-x-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. `ausgehundtest/eingehtete/enklettheit`, 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 2420 bytes long, while a compact script would be no larger than 1100.

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
2421 bytes or more	0%
1761 – 2420 bytes	5%
1101 – 1760 bytes	15%
936 – 1100 bytes	25%
less than 936 bytes	40%

To test your solution, use a command like:

```
./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 unit1exercise4.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, **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/aufrabarbarkeit/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) -rwx--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/anwarftest**? 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.