

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. verkaesung, mode `-w---x---`
2. zerfahrte, mode `r-xrwxr-x`
3. angeklettheit, mode `-----r-x`
4. enrauchheit, mode `rw-r-----`
5. ausgepflumen, mode `--xrw--x`
6. auswitzst, mode `---rwxrw-`
7. angeschmecken, mode `--xr-x--x`
8. aufsprachkeit, mode `-w-rw--wx`
9. ausgepflumen/aushundkeit, mode `-wxr-xr--`
10. angeschmecken/auftritttheit, mode `r-xrw-rw-`
11. angeklettheit/gewarfs, mode `-----x-w-`
12. angeschmecken/zerstehheit, mode `-wxrwx-w-`
13. zerfahrte/ausgegehheit, mode `-w-rwxrwx`
14. ausgepflumen/aushundkeit/aufsteher, mode `rw-rw-rwx`
15. angeschmecken/zerstehheit/gesitzer, mode `r-xr-x-w-`
16. ausgepflumen/aushundkeit/anhalttheit, mode `--x-w--wx`
17. zerfahrte/ausgegehheit/angekraust, mode `---rw-r-x`
18. angeklettheit/gewarfs/ankaesen, mode `r-----rwx`
19. zerfahrte/ausgegehheit/angetritten, mode `rw-x-w-rw-`
20. angeschmecken/auftritttheit/ausgeschmeckte, mode `rw--wxr-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 2553 bytes long, while a compact script would be no larger than 969.

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 |
|---------------------|------------|
| 2554 bytes or more | 0% |
| 1762 – 2553 bytes | 5% |
| 970 – 1761 bytes | 15% |
| 824 – 969 bytes | 25% |
| less than 824 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. `zersetzeit`, mode `r-----rw-`, owner `proxy`, group `dip`
2. `begehen`, mode `--xr--r--`, owner `nobody`, group `floppy`
3. `einhalten`, mode `rw---xr--`, owner `proxy`, group `proxy`
4. `angegehkeit`, mode `-----xr--`, owner `mail`, group `fax`
5. `bewitzs`, mode `-w---xrw`, owner `lp`, group `voice`
6. `aufgewitztheit`, mode `-w---x-w-`, owner `student`, group `floppy`
7. `ausgehtest`, mode `r-xr--r-x`, owner `student`, group `student`

8. angekaess, mode r-----rw-, owner lp, group floppy
9. begehen/berabarbkkeit, mode ---r--rwx, owner mail, group tape
10. zersetzzeit/enkletts, mode rwx----wx, owner mail, group audio
11. angekaess/zersprachen, mode ---r-xr--, owner lp, group fax
12. bewitzs/auffahrse, mode rwx-wx--x, owner news, group mail
13. angekaess/angesinnheit, mode --xrw--wx, owner proxy, group voice
14. angekaess/angesinnheit/aufgelaufkeit, mode ---r-x-w-, owner lp, group cdrom
15. angekaess/angesinnheit/ausgekletttete, mode ---r-xrwx, owner mail, group news
16. zersetzzeit/enkletts/gerabarbse, mode --x----w-, owner mail, group audio
17. angekaess/angesinnheit/einrabarber, mode r-xrw-r-x, owner lp, group voice
18. bewitzs/auffahrse/ausgewarfkeit, mode ---r-xr--, owner proxy, group tape
19. begehen/berabarbkkeit/ausgerabarbung, mode rw-----wx, owner nobody, group fax
20. angekaess/zersprachen/engehtete, mode r---w-r-x, owner lp, group dip

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 2331 bytes long, while a compact script would be no larger than 1195.

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 |
|----------------------|------------|
| 2332 bytes or more | 0% |
| 1764 – 2331 bytes | 5% |
| 1196 – 1763 bytes | 15% |
| 1016 – 1195 bytes | 25% |
| less than 1016 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. `ausfahrts`, mode `---r--rw-`, owner `games`, group `tape`, `setuid`
2. `besitzkeit`, mode `-wx-----`, owner `mail`, group `news`, `setuid`
3. `angegehs`, mode `-w--w--w-`, owner `lp`, group `floppy`, `setuid`
4. `verkatzes`, mode `--xrw--x`, owner `nobody`, group `dip`, `setuid`
5. `zerklettse`, mode `-wxr-x-w-`, owner `uucp`, group `voice`
6. `aufgehaltse`, mode `rw---xr-x`, owner `mail`, group `news`
7. `aufgehundse`, mode `r-x-wxr-x`, owner `uucp`, group `audio`
8. `aufgetrittst`, mode `rw-rwxrw-`, owner `mail`, group `uucp`
9. `aufgetrittst/aufgesetzst`, mode `rwX-----x`, owner `student`, group `floppy`
10. `aufgetrittst/anpflumung`, mode `----wx-wx`, owner `mail`, group `audio`, `setuid`
11. `zerklettse/ausstehtete`, mode `rw--w--wx`, owner `mail`, group `fax`, `setuid`
12. `aufgehaltse/ausgesinnst`, mode `---r-x-wx`, owner `mail`, group `dip`

13. aufgehundse/aufsinnt, mode --xr-x--x, owner games, group mail, setuid
14. aufgehaltse/ausgesinnst/eingehse, mode rwx-wx---, owner news, group floppy, setuid
15. aufgetrittst/aufgesetzst/gewarftest, mode r---wx---, owner mail, group student
16. aufgetrittst/anpflumung/besitzer, mode rw--wx-w-, owner uucp, group dip, setuid
17. aufgehaltse/ausgesinnst/bewitzt, mode ---rw----, owner proxy, group mail
18. aufgetrittst/aufgesetzst/einrabarbarkeit, mode rwx-w-r-x, owner games, group tape, setuid
19. zerklettse/ausstehtete/bespracher, mode r-x----wx, owner student, group proxy, setuid
20. aufgetrittst/aufgesetzst/anhalter, mode -wx-w--w-, owner lp, 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 2392 bytes long, while a compact script would be no larger than 1201.

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 |
|----------------------|------------|
| 2393 bytes or more | 0% |
| 1797 – 2392 bytes | 5% |
| 1202 – 1796 bytes | 15% |
| 1021 – 1201 bytes | 25% |
| less than 1021 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. `aufgetrittheit`, mode `-wxrw-r-x`, group `proxy`
2. `ankletter`, mode `r-x-wx-w-`, group `mail`
3. `zerrennkeit`, mode `-w-r-----`, group `floppy`
4. `berennt`, mode `rwrxwx---`, group `uucp`, `setgid`
5. `angegehtete`, mode `---r--r-x`, group `audio`
6. `aufsinnst`, mode `-wxr----x`, group `dip`
7. `ensitztete`, mode `-w-r-xrwx`, group `floppy`
8. `gesetzkeit`, mode `-w--w--w-`, group `dip`
9. `aufgetrittheit/geraucht`, mode `-wxrwxr--`, group `voice`
10. `ankletter/gewarfen`, mode `rw-x-w---x`, group `proxy`, `setgid`
11. `aufgetrittheit/anschmeckheit`, mode `--xr--r-x`, group `tape`, `setgid`
12. `aufsinnst/aufgelaufung`, mode `----wxrwx`, group `mail`
13. `aufgetrittheit/verkaestest`, mode `rwxr----x`, group `uucp`
14. `aufgetrittheit/verkaestest/gelaufte`, mode `r--rw-r-x`, group `student`, `setgid`
15. `aufgetrittheit/verkaestest/ankaeskeit`, mode `--xr--rw-`, group `cdrom`
16. `ankletter/gewarfen/einkrautest`, mode `---r-x--x`, group `mail`, `setgid`
17. `ankletter/gewarfen/verhalts`, mode `r--r-xr--`, group `dip`, `setgid`
18. `aufsinnst/aufgelaufung/zerkrauung`, mode `--x-w----`, group `voice`, `setgid`

19. `aufgetrittheit/verkaestest/einrennse`, mode `r--rwx---`, group `news`
20. `aufgetrittheit/verkaestest/zerhunds`, mode `rw-r--rwx`, group `audio`,
`setgid`

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 2461 bytes long, while a compact script would be no larger than 1144.

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 |
|---------------------|------------|
| 2462 bytes or more | 0% |
| 1803 – 2461 bytes | 5% |
| 1145 – 1802 bytes | 15% |
| 973 – 1144 bytes | 25% |
| less than 973 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 **nobody**, who is a member of the **dip** group, **read from** the file `/verschmeckst/aufgesitzen/besetzte`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x-w-rwx   nobody    news      0 verschmeckst
    │
    └─ (2)      drw----rwx   proxy     cdrom      0 aufgesitzen
        │
        └─ (3)  -rw---xrwx   nobody     tape      0 besetzte

```

5.2

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

```

/
├─ (1)      dr-xrw-r--   student   proxy      0 auskatzeung
    │
    └─ (2)      drwxr-x--x student   floppy    0 aufgestehheit
        │
        └─ (3)  -r--r--rwx student    mail      0 anpflumen

```

5.3

Can the user **games**, who is a member of the **mail** group, **execute** the file `/angesinnen/bekrause/enstehkeit`? If not, which of the three directories blocks access (Y|1|2|3)


```

/
├─ (1)      d----w-rwx      mail      audio      0 angesinnen
│
│   └─ (2)   dr-----rwx      nobody      news      0 bekrause
│
│       └─ (3) --wxr--rwx      news      proxy      0 entstehkeit

```

5.4

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

```

/
├─ (1)      drwxr-xrwx      mail      audio      0 zersitzkeit
│
│   └─ (2)   drwx-w--wx      mail      mail      0 bespracht
│
│       └─ (3) --w-r--r-x      games      uucp      0 zerkatzese

```

5.5

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

```

/
├─ (1)      d-w-rwx---      games      voice      0 angetrittst
│
│   └─ (2)   dr--rwxrw-      uucp      audio      0 zertritttheit
│
│       └─ (3) --wxr--r-x      mail      cdrom      0 anrauchte

```

5.6

Can the user **news**, who is a member of the **voice** group, **execute** the file **/zerwitzer/aufsetzttest/zerrabarbtte**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d----wxr-x      mail      tape      0 zerwitzer
│
│   └─ (2)   d-wxrwxr-x      lp      voice      0 aufsetzttest
│
│       └─ (3) ----rwxr-x      games      fax      0 zerrabarbtte

```

5.7

Can the user **lp**, who is a member of the **cdrom** group, **write to** the file **/aussprache/betrittse/ensetztete**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drwxrwxr--      mail      cdrom      0 aussprache
│   └─ (2)      drwx----w-      lp        dip        0 betrittse
│       └─ (3) -r-xr--rwx      lp        floppy     0 ensetztete
```

5.8

Can the user **uucp**, who is a member of the **cdrom** group, **write to** the file **/einkrause/angekrauen/ausrennt**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      dr-xr-x--x      proxy      cdrom      0 einkrause
│   └─ (2)      drwx-----x      mail      cdrom      0 angekrauen
│       └─ (3) --wxr-xrwx      mail      voice      0 ausrennt
```

5.9

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

```
/
├─ (1)      drwx-wxr-x      news      cdrom      0 gekletter
│   └─ (2)      dr-x-wxr--      proxy    student     0 anpflumtete
│       └─ (3) -r--rw--wx      mail      news      0 ausgewarfheit
```

5.10

Can the user **uucp**, who is a member of the **fax** group, **write to** the file **/angekatzete/aufgetraust/einwitzheit**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x--xrw-    uucp    cdrom    0 angekatzete
│
│   └─ (2)      drwxrw-r-x    mail      dip    0 aufgetraust
│       │
│       └─ (3) -r-x-----wx    proxy     news    0 einwitzheit

```

5.11

Can the user **nobody**, who is a member of the **audio** group, **read from** the file **/ausgestehs/ensetztheit/bsinntete**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwx--x-wx    nobody    uucp    0 ausgestehs
│
│   └─ (2)      drw---xrwX    uucp    student  0 ensetztheit
│       │
│       └─ (3) -r-xrwX-wx    nobody    voice    0 bsinntete

```

5.12

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

```

/
├─ (1)      dr--rw-rwx    mail      audio    0 angesitztete
│
│   └─ (2)      d--xrwXrwX    mail      dip    0 angerauchtheit
│       │
│       └─ (3) -r-----xrw-    news      mail    0 zerspracher

```

5.13

Can the user **student**, who is a member of the **fax** group, **read from** the file **/anwarfst/angesprachs/aufhalttest**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-w--wxr-x    uucp      floppy    0 anwarfst
│
│   └─ (2)      d---rwXrwX    uucp      voice    0 angesprachs
│       │
│       └─ (3) -r---w--w-    student    dip    0 aufhalttest

```

5.14

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

```

/
├─ (1)      dr-x---rwx      mail      voice      0 aufsitzer
│   └─ (2)   drw--w-rwx      lp        proxy      0 ausgerauchtest
│       └─ (3) -rwxr-----      mail      mail      0 enrennen
```

5.15

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

```

/
├─ (1)      drwxrwxr--      games      fax        0 verkletttete
│   └─ (2)   d--xr-xr-x      mail        fax        0 enpflumtest
│       └─ (3) -r-----w-      lp        proxy      0 bewarfte
```

5.16

Can the user **uucp**, who is a member of the **cdrom** group, **write to** the file **/aufsitztest/aussitzte/anpflumse**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x-wxr-x      student      tape      0 aufsitztest
│   └─ (2)   d-wx---rw-      news        cdrom      0 aussitzte
│       └─ (3) -r--rwxrw-      nobody     student    0 anpflumse
```

5.17

Can the user **lp**, who is a member of the **voice** group, **read from** the file **/angewitzst/ausgerauchte/zerkatzetest**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drw-r-x-w-    uucp    news    0 angewitzst
│   └─ (2)      dr-xr----x      lp student    0 ausgerauchte
│       └─ (3)  --wxr--rw- student    cdrom    0 zerkatzetest

```

5.18

Can the user **lp**, who is a member of the **tape** group, **read from** the file **/angehaltung/einwarfs/angesitzse**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwx---rwx      lp    news    0 angehaltung
│   └─ (2)      drwxr-x--x    games tape    0 einwarfs
│       └─ (3)  ---xr-xr-x    news  tape    0 angesitzse

```

5.19

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

```

/
├─ (1)      d-w---xr-x      games voice    0 ensprachte
│   └─ (2)      dr-xr-x-wx student news    0 ausgefahrt
│       └─ (3)  --w----rwx    uucp  dip     0 zerkletter

```

5.20

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

```

/
├─ (1)      d---r-xr-x      mail    uucp    0 gehundkeit
│   └─ (2)      drwx-wx-wx    uucp    voice    0 ausgetrittung
│       └─ (3)  -----w-rwx    mail    uucp    0 angerauchtest

```

5.21

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

```
/
├─ (1)      d---rw----   games   voice   0 angeklettete
│   └─ (2)   d-----rwx   proxy   student  0 zerhundse
│       └─ (3) -rwxr-x-w-   uucp    proxy   0 angesitzung
```

5.22

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

```
/
├─ (1)      dr-xr-x---   mail    student  0 ausgekraust
│   └─ (2)   d---r-xrw-   student  uucp     0 aufhaltung
│       └─ (3) -r--r--rw-   mail     voice   0 angestehs
```

5.23

Can the user **lp**, who is a member of the **news** group, **read from** the file **/angegeher/bestehse/aufrenns**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drwxr-x-wx    lp      audio    0 angegeher
│   └─ (2)   d-wx-w-rwx   games   news     0 bestehse
│       └─ (3) -r--rwxr--   lp       fax     0 aufrenns
```

5.24

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

```

/
├─ (1)      drwx-wx---  nobody   cdrom    0 ausschmecktest
│   └─ (2)      d-w--w-rwx  proxy   cdrom    0 ausgeraucher
│       └─ (3)  --w-r-x--x    uucp     uucp     0 enwitzete

```

5.25

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

```

/
├─ (1)      dr-xrwx---    lp     proxy    0 einsinntest
│   └─ (2)      drw----r-x  nobody  voice    0 besinnse
│       └─ (3)  --wx-wx-wx   games    mail     0 gekaesens

```

5.26

Can the user **games**, who is a member of the **dip** group, **execute** the file **/ensprachtest/einsetzer/aufgestehs**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr--rwx-wx  student   dip     0 ensprachtest
│   └─ (2)      dr-xrwx-wx  student   dip     0 einsetzer
│       └─ (3)  --w--wxrw-   games     floppy  0 aufgestehs

```

5.27

Can the user **games**, who is a member of the **dip** group, **execute** the file **/auflaufkeit/zerrauchte/gelaufst**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwxr-x---    games  student  0 auflaufkeit
│   └─ (2)      dr--rw-rwx    uucp  student  0 zerrauchte
│       └─ (3)  -----w--wx   games    mail    0 gelaufst

```

5.28

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

```
/
├─ (1)      dr--rwx--x      news      cdrom      0 einkatzete
│   └─ (2)   dr-x--xr-x      proxy      voice      0 versinnte
│       └─ (3) -r-----r--      uucp        dip      0 getrittung
```

5.29

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

```
/
├─ (1)      dr---wxrwx      uucp      cdrom      0 angestehung
│   └─ (2)   d--x-w-r--      lp        fax        0 enwarfs
│       └─ (3) -rwx-wx-wx      proxy      dip        0 enstehetest
```

5.30

Can the user **news**, who is a member of the **voice** group, **execute** the file **/aufschmecks/aufgerauchen/ausgesitzse**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drwxr--r-x      lp        mail      0 aufschmecks
│   └─ (2)   drwxrwxrw-      nobody     voice     0 aufgerauchen
│       └─ (3) -rw-rw-r-x      mail      news      0 ausgesitzse
```

5.31

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


```

/
├─ (1)      drw-r-xrwx    news   floppy    0 versinner
│   └─ (2)      d-wxr-xrwx    mail   audio     0 aussinnt
│       └─ (3)  -r-xr-x---    lp     floppy    0 aufkrautest

```

5.32

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

```

/
├─ (1)      d-wxr-xrwx    nobody   uucp     0 zersetzer
│   └─ (2)      dr-x--xr--    news     uucp     0 angekatzekeit
│       └─ (3)  ---xrw---wx    news     news     0 bewitzkeit

```

5.33

Can the user **uucp**, who is a member of the **fax** group, **read from** the file **/angetraut/verfahrtest/ausgeklettkeit**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x----wx     uucp     fax      0 angetraut
│   └─ (2)      dr--rwxrw-   nobody    fax      0 verfahrtest
│       └─ (3)  --wxrw-r-x    uucp     uucp     0 ausgeklettkeit

```

5.34

Can the user **nobody**, who is a member of the **voice** group, **read from** the file **/aufgehung/angefahrkeit/aussetzen**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwx--xr-x     nobody    fax      0 aufgehung
│   └─ (2)      d--xr-xrwx    mail     fax      0 angefahrkeit
│       └─ (3)  --w-rwxr-x    uucp     voice    0 aussetzen

```

5.35

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

```
/
├─ (1)      d----wxrwx   games   mail   0 anhalttete
│
├─ (2)      dr--rwx--x   uucp   student  0 beschmecks
│
└─ (3)      --w--w-r--   student  mail   0 zertraute
```

5.36

Can the user **nobody**, who is a member of the **audio** group, **read from** the file **/aufspracher/gegeht/ausgehalttete**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      d---r-xrwx   uucp     tape    0 aufspracher
│
├─ (2)      d-w--wxrwx   student  mail    0 geht
│
└─ (3)      ---x---r--   news     tape    0 ausgehalttete
```

5.37

Can the user **nobody**, who is a member of the **cdrom** group, **execute** the file **/angekatzet/verrabarbarkeit/aussteher**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      dr-xrw-rw-   nobody   floppy  0 angekatzet
│
├─ (2)      dr-x-w-----   games    cdrom    0 verrabarbarkeit
│
└─ (3)      ----rwx---   student   cdrom    0 aussteher
```

5.38

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

```

/
├─ (1)      dr--r-x-w-   news  student    0 zerrauchtete
│   └─ (2)      d-w-r-x--- nobody student    0 aufgewitzte
│       └─ (3)  --wx----wx   news   news      0 inhaltst

```

5.39

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

```

/
├─ (1)      dr-xr-xr-x  student floppy    0 aufklettung
│   └─ (2)      dr-x-wxr-x   uucp   cdrom    0 einwarft
│       └─ (3)  -r---wxrwx   mail   audio    0 angepflumen

```

5.40

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

```

/
├─ (1)      d--xr-x-w-   nobody   news      0 ansprachs
│   └─ (2)      drwxrwx-wx student  news      0 angekatzetest
│       └─ (3)  --wxrw--wx student  news      0 zerwarfen

```

Hash for checking if you have all 40 correct

390af7058d5f9c1188fd74982d9466bda3f48c04e90dd285dec023ab84056e27

You can check your result with a command like:

```

echo "2YY13YY2YYYYY3Y3YY2Y2YY11Y2Y1YY2YYY3Y3YY" | \
    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.