

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. verkaesen, mode `rwrxwxr--`
2. enhundst, mode `rw-rw----`
3. bepflumheit, mode `-----wx`
4. zersinnse, mode `---rwx-w-`
5. besprachst, mode `-wx--xrw-`
6. auswitzer, mode `r-x-----`
7. verrabarbst, mode `r-----`
8. zertritter, mode `rw--w-rw-`
9. auswitzer/aufgerabarbt, mode `rwrxw--w-`
10. auswitzer/angewarfen, mode `-----w-`
11. auswitzer/angetraust, mode `r--r--rw-`
12. zertritter/aufklettheit, mode `-wxrw-rwx`
13. verkaesen/aufwarftest, mode `r-x---rwx`
14. auswitzer/angetraust/auspflumse, mode `-w--wx--x`
15. zertritter/aufklettheit/angerabarbheit, mode `-w---x-w-`
16. verkaesen/aufwarftest/aufgerennung, mode `-w----r-x`
17. auswitzer/aufgerabarbt/befahrt, mode `-wx-wxrw-`
18. auswitzer/aufgerabarbt/einkrauen, mode `--xrw--w-`
19. zertritter/aufklettheit/angekrauung, mode `r-xrwx-w-`
20. auswitzer/angewarfen/aufgesetztheit, mode `-----w-`

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 2455 bytes long, while a compact script would be no larger than 965.

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
2456 bytes or more	0%
1711 – 2455 bytes	5%
966 – 1710 bytes	15%
821 – 965 bytes	25%
less than 821 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. `verrennkeit`, mode `rw-----wx`, owner `news`, group `floppy`
2. `enpflumen`, mode `-----x-w-`, owner `news`, group `news`
3. `angetritter`, mode `r-x---rwx`, owner `news`, group `tape`
4. `besprachtest`, mode `-wxr-x-wx`, owner `proxy`, group `fax`
5. `enpflums`, mode `---rwx-wx`, owner `news`, group `fax`
6. `verklettt`, mode `rwx--x--x`, owner `proxy`, group `tape`
7. `aufgewarfs`, mode `rw-r-x-wx`, owner `mail`, group `floppy`

8. aushundheit, mode `rw---x---`, owner `news`, group `student`
9. enpflumen/beklettte, mode `-w-r---wx`, owner `mail`, group `student`
10. enpflumen/aufgesitzse, mode `--xwx-wx`, owner `news`, group `cdrom`
11. angetritter/antrittung, mode `--x--xrw-`, owner `mail`, group `student`
12. verklettt/aufwarfheit, mode `rwx-w-r-x`, owner `proxy`, group `voice`
13. angetritter/beschmeckung, mode `----wxr--`, owner `lp`, group `audio`
14. verklettt/aufwarfheit/enwarfst, mode `-wx-wxrw`, owner `games`, group `tape`
15. angetritter/beschmeckung/ausgesprachs, mode `-wx-w--wx`, owner `news`, group `student`
16. angetritter/beschmeckung/aufkletts, mode `r---w----`, owner `proxy`, group `floppy`
17. verklettt/aufwarfheit/bestehs, mode `-wxr-----x`, owner `news`, group `fax`
18. enpflumen/aufgesitzse/zerraucher, mode `-w--w-rwx`, owner `nobody`, group `tape`
19. angetritter/antrittung/ankaeser, mode `r--r--r--`, owner `games`, group `dip`
20. angetritter/beschmeckung/ausrauchheit, mode `rwx-w---x`, owner `nobody`, group `cdrom`

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 2368 bytes long, while a compact script would be no larger than 1190.

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
2369 bytes or more	0%
1780 – 2368 bytes	5%
1191 – 1779 bytes	15%
1012 – 1190 bytes	25%
less than 1012 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. `anwarftest`, mode `rw-rw-r--`, owner `proxy`, group `dip`
2. `einrauchen`, mode `rw-r-x---`, owner `uucp`, group `proxy`, `setuid`
3. `angetritttst`, mode `-wxr-xr--`, owner `proxy`, group `mail`, `setuid`
4. `einrabarber`, mode `r-----r-x`, owner `student`, group `dip`
5. `aufgetritttete`, mode `-w--wx---`, owner `news`, group `mail`
6. `auswitzte`, mode `---rwx--x`, owner `mail`, group `audio`, `setuid`
7. `zerrabarb`, mode `r--rw----`, owner `uucp`, group `dip`
8. `zersetzt`, mode `-wx-wx-rwx`, owner `uucp`, group `dip`, `setuid`
9. `aufgetritttete/aufgefahrtete`, mode `-----xrw-`, owner `games`, group `voice`, `setuid`
10. `zerrabarbt/angerabarbs`, mode `r---wx-w-`, owner `mail`, group `mail`
11. `zersetzt/ausgekrauen`, mode `-w-r--r-x`, owner `mail`, group `uucp`, `setuid`
12. `angetritttst/versprachst`, mode `rw-x-w-rwx`, owner `mail`, group `proxy`, `setuid`

13. `auswitzte/angeschmecktest`, mode `rw-r---x`, owner `student`, group `news`
14. `zerrabarbt/angerabarbs/bestehkeit`, mode `rx-w--wx`, owner `games`, group `student`, `setuid`
15. `zerrabarbt/angerabarbs/bekraus`, mode `-w-rwxr--`, owner `nobody`, group `floppy`, `setuid`
16. `aufgetritttete/aufgefahrtete/aufgewitzung`, mode `-w-r-x--x`, owner `news`, group `dip`
17. `angetrittst/versprachst/gepflumse`, mode `rw--w----`, owner `mail`, group `fax`
18. `aufgetritttete/aufgefahrtete/ausgehaltheit`, mode `----w-r--`, owner `proxy`, group `news`, `setuid`
19. `aufgetritttete/aufgefahrtete/aufrennt`, mode `rxr-xrw-`, owner `news`, group `uucp`, `setuid`
20. `zerrabarbt/angerabarbs/anfahren`, mode `rx-wx-w-`, owner `mail`, group `student`

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 2465 bytes long, while a compact script would be no larger than 1240.

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
2466 bytes or more	0%
1853 – 2465 bytes	5%
1241 – 1852 bytes	15%
1055 – 1240 bytes	25%
less than 1055 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. `einwitzse`, mode `r-x-w--wx`, group `voice`, `setgid`
2. `aufwitzung`, mode `r--r-xrwx`, group `proxy`
3. `einstehst`, mode `-w----rw-`, group `tape`
4. `gelaufkeit`, mode `rw-r-x---`, group `student`, `setgid`
5. `verfahrtest`, mode `--x-w-rwx`, group `audio`, `setgid`
6. `verfahrs`, mode `--xr--rwx`, group `dip`
7. `auffahren`, mode `--x--x--x`, group `news`, `setgid`
8. `begehs`, mode `-wx-w----`, group `fax`
9. `einwitzse/befahrtete`, mode `-w-r-xrwx`, group `tape`
10. `einwitzse/verklettung`, mode `---r--rwx`, group `cdrom`
11. `auffahren/gekaest`, mode `-w--wx---`, group `student`
12. `verfahrs/bewitzse`, mode `rw-r-xrwx`, group `voice`, `setgid`
13. `verfahrtest/angegeher`, mode `rw-rw---x`, group `cdrom`, `setgid`
14. `einwitzse/verklettung/belaufung`, mode `rw-x-w-rw-`, group `proxy`, `setgid`
15. `einwitzse/befahrtete/angesetzttest`, mode `rw-----wx`, group `floppy`
16. `verfahrtest/angegeher/angehaltete`, mode `r-xr---w-`, group `voice`, `setgid`
17. `auffahren/gekaest/zerstehung`, mode `-wxrwxrw-`, group `mail`, `setgid`
18. `auffahren/gekaest/auftrittung`, mode `--x-wxr-x`, group `tape`, `setgid`
19. `auffahren/gekaest/enrauchkeit`, mode `--x----w-`, group `floppy`, `setgid`

20. `einwitzse/befahrtete/aufstehen`, mode `rwX---rwx`, 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 2322 bytes long, while a compact script would be no larger than 1132.

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
2323 bytes or more	0%
1728 – 2322 bytes	5%
1133 – 1727 bytes	15%
963 – 1132 bytes	25%
less than 963 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 **proxy**, who is a member of the **cdrom** group, **write to** the file `/angekaeskeit/anpflumt/auftraute`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d--x-wxr-x      lp      fax      0 angekaeskeit
│
├─ (2)      dr-xrw-r--      proxy    news      0 anpflumt
│
└─ (3)      --wx--x--x      proxy    proxy     0 auftraute

```

5.2

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

```

/
├─ (1)      d-wxrw-r-x      lp      cdrom     0 enstehheit
│
├─ (2)      d-wx-w-r-x      lp      fax      0 aufhaltt
│
└─ (3)      -rw-rwxrw-     student  fax      0 ensinntest

```

5.3

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

```

/
├─ (1)      dr-xr-xr-x      uucp     voice     0 enfahrheit
│
├─ (2)      drw-rwx-w-      news     audio     0 angekrautest
│
└─ (3)      -r-xrwxr-x     student student  0 zerrabarber

```


5.4

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

/					
└─ (1)	drwxr--rwx	uucp	cdrom	0	ausgerabarbkeit
└─ (2)	drwx--x-w-	uucp	floppy	0	angetrittse
└─ (3)	-rw--w-r-x	games	audio	0	angesinnheit

5.5

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

/					
└─ (1)	dr-x---rw-	uucp	floppy	0	auskaesse
└─ (2)	d--xr--r-x	games	student	0	enklettse
└─ (3)	--wx---rwx	uucp	floppy	0	anfahrt

5.6

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

/					
└─ (1)	drwxrw-rwx	news	cdrom	0	betrauung
└─ (2)	d-wxr--r-x	mail	floppy	0	enlaufte
└─ (3)	---x----w-	news	cdrom	0	angegehse

5.7

Can the user **nobody**, who is a member of the **student** group, **read from** the file **/verklettst/gesteher/aushundtest**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-wxr-x-wx    news  student    0 verklestst
│   └─ (2)    drwxr--r-x   games  proxy      0 gestehet
│       └─ (3)  --wx-wxr--   games    dip      0 aushundtest

```

5.8

Can the user **student**, who is a member of the **tape** group, **read from** the file **/angesetzst/angehunder/besetzst**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwxrw-rwx  student  floppy    0 angesetzst
│   └─ (2)    d-wxr--r-x   uucp    voice      0 angehunder
│       └─ (3)  -r--r----- student    fax      0 besetzst

```

5.9

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

```

/
├─ (1)      drwx--x--x    news    voice      0 aufgerabarben
│   └─ (2)    dr-xrw-rwx   proxy   floppy     0 ausgeschmeckse
│       └─ (3)  -----wxr-x    lp    proxy     0 zersitzst

```

5.10

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

```

/
├─ (1)      dr-x--x--x  student  audio      0 angelaufs
│   └─ (2)    dr-x---rw-   proxy   voice      0 anlaufkeit
│       └─ (3)  ---xrwx-w-   mail    voice      0 zerhaltheit

```

5.11

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

```
/
├─ (1)      d-wxrwxrwx    games    tape    0 einkatzetest
│   └─ (2)      d-----r-x student student 0 angekaesst
│       └─ (3) -r--rwx-wx  proxy  student 0 ausgekaesheit
```

5.12

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

```
/
├─ (1)      dr-xr-x---    uucp    audio    0 zersinntete
│   └─ (2)      d-wxr--r-x nobody  news    0 ausgekrauer
│       └─ (3) -r-xr--r-x  news    cdrom    0 verpflumkeit
```

5.13

Can the user **news**, who is a member of the **cdrom** group, **execute** the file **/angeraucher/anrennse/angewarfkeit**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drwxrwxr--    games    cdrom    0 angeraucher
│   └─ (2)      d--x-wxr-x uucp    mail    0 anrennse
│       └─ (3) -rwxr-x-w-  mail    cdrom    0 angewarfkeit
```

5.14

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

```

/
├─ (1)      dr--r-xrwx   nobody   audio    0 gesprachtest
│   └─ (2)      drwx-w-r-x   news     cdrom    0 ausrenns
│       └─ (3)  -rwx-wxr--   uucp      dip     0 einkletts

```

5.15

Can the user **games**, who is a member of the **floppy** group, **execute** the file **/ansinnheit/getrauen/ausgehundung**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d--x---r-x      lp      fax      0 ansinnheit
│   └─ (2)      d---rwx-wx      lp     floppy    0 getrauen
│       └─ (3)  -----x-wx   news     news     0 ausgehundung

```

5.16

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

```

/
├─ (1)      drwxrwx-w-   nobody   audio    0 auswitzs
│   └─ (2)      dr-x--x-wx   proxy     uucp    0 gesinntest
│       └─ (3)  --wx-wxr-x   proxy     proxy    0 aufgetrittse

```

5.17

Can the user **lp**, who is a member of the **fax** group, **read from** the file **/aufrabarbtete/aufrennse/vertraute**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x-w---wx      lp     floppy    0 aufrabarbtete
│   └─ (2)      d-w-r-xr-x   mail     uucp    0 aufrennse
│       └─ (3)  ----rw--w-   lp      tape     0 vertraute

```

5.18

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

/					
└─ (1)	dr-x--x-w-	nobody	floppy	0	ausgehaltst
└─ (2)	dr-xrw--wx	proxy	tape	0	ausgesinntete
└─ (3)	-r-x--xrwx	games	dip	0	aufgekletter

5.19

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

/					
└─ (1)	d-wxr-r-x	mail	mail	0	aufgekraute
└─ (2)	drwxrw-rwx	uucp	floppy	0	ausgetritttete
└─ (3)	-r----xrwx	news	dip	0	verklettete

5.20

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

/					
└─ (1)	dr-x-w----	proxy	uucp	0	auskatzetete
└─ (2)	drwx--x--x	lp	student	0	zersinnen
└─ (3)	---xrwx---	news	student	0	angestehheit

5.21

Can the user **student**, who is a member of the **cdrom** group, **read from** the file **/ausgesetzse/aufhundkeit/beklettst**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-wxrwx--x      uucp      cdrom      0 ausgesetzse
    │
    └─ (2)      d--xrwx-wx      news      cdrom      0 aufhundkeit
        │
        └─ (3) -r--rwx---      student      uucp      0 beklettst

```

5.22

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

```

/
├─ (1)      drw-rwxr-x      mail      news      0 auskatzeheit
    │
    └─ (2)      dr-xrw----      games      floppy      0 besinnkeit
        │
        └─ (3) --wxr-xrwx      mail      voice      0 zersitzkeit

```

5.23

Can the user **lp**, who is a member of the **uucp** group, **read from** the file **/angewarftete/anrauchst/gerabarbttete**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-xrw--w-      lp      uucp      0 angewarftete
    │
    └─ (2)      dr--rwx---      mail      uucp      0 anrauchst
        │
        └─ (3) -rw-r-xrwx      proxy      cdrom      0 gerabarbttete

```

5.24

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

```

/
├─ (1)      d-wxr-xrwx      lp      cdrom      0 anfahrst
    │
    └─ (2)      dr-xrwxrw-      student      fax      0 aussprachs
        │
        └─ (3) -rw-rwx-wx      uucp      cdrom      0 anhaltst

```

5.25

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

```
/
├─ (1)      dr-xr-x---   uucp    news    0 bewarfte
│
├─ (2)      drwx-w--wx   uucp    student  0 anfahrer
│
└─ (3)      --wxr-x--x   uucp    student  0 verhundst
```

5.26

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

```
/
├─ (1)      drwx-wxr--   uucp    proxy    0 ausgesinntest
│
├─ (2)      drwx-w-r--   uucp    student  0 einwitzst
│
└─ (3)      -rwxrw-r--   uucp      fax    0 aufgewitzst
```

5.27

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

```
/
├─ (1)      drw-r-x---   games    news    0 angepflumst
│
├─ (2)      d-wxrwxrw-   lp      dip    0 aussetzung
│
└─ (3)      ---xrwx---   proxy    dip    0 ansetzheit
```

5.28

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

```

/
├─ (1)      dr-----rwx   nobody    dip      0 ausgekaess
    │
    └─ (2)   d--xr-xrw-     lp      floppy  0 anhundheit
        │
        └─ (3) -r---w-r--    mail     proxy    0 einsprachte

```

5.29

Can the user **games**, who is a member of the **floppy** group, **write to** the file **/einhundst/angelaufst/aufgewarfse**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-wxrwxr-x      lp      floppy  0 einhundst
    │
    └─ (2)   dr--r-xrwx      uucp     floppy  0 angelaufst
        │
        └─ (3) ---xr-x-w-    uucp     voice   0 aufgewarfse

```

5.30

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

```

/
├─ (1)      drw-r-x--x      proxy    audio   0 auspflumen
    │
    └─ (2)   d-wxr-xrw-     news      audio   0 gefahrkeit
        │
        └─ (3) ---xrw---x    uucp     student 0 angefahrt

```

5.31

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

```

/
├─ (1)      d--x-wxr-x      proxy    tape    0 geschmeckst
    │
    └─ (2)   d---r-x-wx      games     news    0 eintrautete
        │
        └─ (3) --w---xrw-    student   uucp    0 anschmeckt

```


5.32

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

```
/
├─ (1)      drwx--xrwx   nobody    tape    0 auffahrttest
│   └─ (2)   dr-xrw-rw-   games     news    0 auftrittte
│       └─ (3) -rw-----w-    lp      student  0 gesinnung
```

5.33

Can the user **games**, who is a member of the **dip** group, **write to** the file **/ausgerennte/aufschmeckung/zergehheit**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drwxr-x--x   student    dip     0 ausgerennte
│   └─ (2)   dr-xr-xrwx   student    dip     0 aufschmeckung
│       └─ (3) --wx---r-x   games     student  0 zergehheit
```

5.34

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

```
/
├─ (1)      d--xrwx-w-   uucp       fax     0 einsetzung
│   └─ (2)   drwx--xr--   student    mail    0 ankatzet
│       └─ (3) --wxr-xrwx   mail       proxy   0 angesetzer
```

5.35

Can the user **proxy**, who is a member of the **tape** group, **write to** the file **/verrauchtest/ausschmeckheit/bewitzt**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-wx---r-x    uucp    news    0 verrauchtest
│   └─ (2)    dr--r-x-w-    uucp    tape    0 ausschmeckheit
│       └─ (3) --w-r--rw-    lp      dip     0 bewitzt

```

5.36

Can the user **lp**, who is a member of the **uucp** group, **read from** the file **/aufgepflumen/angesitzs/ausgesinnst**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d--xrwxrwx    nobody   cdrom    0 aufgepflumen
│   └─ (2)    d---rw-rwx    mail     proxy    0 angesitzs
│       └─ (3) ---x--xrw-    proxy    fax      0 ausgesinnst

```

5.37

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

```

/
├─ (1)      dr--r-xr-x    nobody   floppy   0 anfahung
│   └─ (2)    drwxrwxr-x    uucp     uucp     0 aushalten
│       └─ (3) -----w----    lp      mail     0 enrenntest

```

5.38

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

```

/
├─ (1)      d--xrwxrw-    lp      news    0 bekrautete
│   └─ (2)    dr-xrwxr-x    news     fax     0 aufklettkeit
│       └─ (3) --wxrwx---    news     voice   0 angewarftete

```

5.39

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

```
/
├─ (1)      d-wxr-x-w-   proxy  student    0 ausgefahrt
│   └─ (2)      d--xr-xrwx  games  student    0 ausgeschmecker
│       └─ (3) -r--r-x-wx   uucp   student    0 einrabarbarkeit
```

5.40

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

```
/
├─ (1)      dr-xr-x--x    news    dip        0 verraucht
│   └─ (2)      drwxrwx--x proxy   dip        0 aufgerennt
│       └─ (3) -r--rwxr--  news    tape      0 bepflumst
```

Hash for checking if you have all 40 correct

fa0362758e8c37530a1755b0ad6ea127b08a1a7763338f26cf64dd14c6b76389

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.