

# Network Engineering 2019 Exercises - Unit 1

## 1 Basic POSIX file permissions

Write a shell-script called `unit1-solution1.sh` that creates **directories** inside a directory called `unit1exercise1` with the following properties, and then creates a **compressed tar file** called `unit1-solution1.tgz`

1. 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. aufspraakheit, 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 2554 bytes long, while a compact script would be no larger than 970.

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
2555 bytes or more	0%
1763 – 2554 bytes	5%
971 – 1762 bytes	15%
825 – 970 bytes	25%
less than 825 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-solution1762.sh unit1-solution2060361684.tgz
git push origin master
```

## 2 User and groups

Write a shell-script called `unit1-solution2.sh` that creates **directories** inside a directory called `unit1exercise2` with the following properties, and then creates a **compressed tar file** called `unit1-solution2.tgz`

1. `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. `aufgewitzheit`, 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/berabarbkeit, 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/ausgeklettete, mode `---r-xrw`, 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/berabarbkeit/ausgerababung, 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 2332 bytes long, while a compact script would be no larger than 1196.

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
2333 bytes or more	0%
1765 – 2332 bytes	5%
1197 – 1764 bytes	15%
1017 – 1196 bytes	25%
less than 1017 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-solution1764.sh unit1-solution2060361684.tgz
git push origin master
```

### 3 Set-user and Set-group ID

Write a shell-script called `unit1-solution3.sh` that creates **directories** inside a directory called `unit1exercise3` with the following properties, and then creates a **compressed tar file** called `unit1-solution3.tgz`

1. `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/aufgesetztst/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/aufgesetztst/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/aufgesetztst/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 2393 bytes long, while a compact script would be no larger than 1202.

Grading for this exercise for you is according to the following guide:

Requirement	Percentage
Correctness of solution	60%
Compactness of solution	40%

The compactness scores are according to the following table:

Length of script	Percentage
2394 bytes or more	0%
1798 – 2393 bytes	5%
1203 – 1797 bytes	15%
1022 – 1202 bytes	25%
less than 1022 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-solution1797.sh unit1-solution2060361684.tgz
git push origin master
```

## 4 Set-group ID Directories

Write a shell-script called `unit1-solution4.sh` that creates **directories** inside a directory called `unit1exercise4` with the following properties, and then creates a **compressed tar file** called `unit1-solution4.tgz`

1. `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/zerkrautung, 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 2462 bytes long, while a compact script would be no larger than 1145.

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
2463 bytes or more	0%
1804 – 2462 bytes	5%
1146 – 1803 bytes	15%
974 – 1145 bytes	25%
less than 974 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-solution1803.sh unit1-solution2060361684.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 enstehkeit
```

### 5.4

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

```
/
├─ (1)      drwxr-xrwx      mail      audio      0 zersitzzeit
│
├─ (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/zertrittheit/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 zertrittheit
│
└─ (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/zerrabarbte**? 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 zerrabarbte

```

## 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/ensetzheit/besinntete**? 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 ensetzheit
│       └─ (3) -r-xrwX-wx   nobody    voice    0 besinntete
```

### 5.12

Can the user **news**, who is a member of the **dip** group, **read from** the file **/angesitztete/angerauchheit/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 angerauchheit
│       └─ (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/enwitztete`? 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 enwitztete
```

## 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 gekaesen
```

## 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/verrabararbeit/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 verrabararbeit
│       └─ (3)  ----rwx---   student   cdrom      0 aussteher

```

### 5.38

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

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

### 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 "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.