

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. `anpflumst`, mode `r-x-wx-w-`
2. `entraut`, mode `---rwxrwx`
3. `einwitzs`, mode `r-x-wxr-x`
4. `gewarfheit`, mode `-wx----w-`
5. `gekletts`, mode `-w-----x`
6. `einlaufse`, mode `r--rw----`
7. `angehundtest`, mode `-w-r----x`
8. `enrauchheit`, mode `rw-r-x---`
9. `enrauchheit/enschmecktest`, mode `rw-rw-rw-`
10. `gekletts/angetrauen`, mode `-w-r-xr--`
11. `gewarfheit/aufkaest`, mode `r---wx-wx`
12. `einwitzs/aufgetraung`, mode `r-x-wxrwx`
13. `entraut/zerklettst`, mode `rw-x-w--wx`
14. `gekletts/angetrauen/auspflumte`, mode `-----x---`
15. `gekletts/angetrauen/angehundt`, mode `-wxrw-rwx`
16. `entraut/zerklettst/einkatzete`, mode `--x-w-rw-`
17. `gewarfheit/aufkaest/ausgesprachkeit`, mode `--x-w---x`
18. `enrauchheit/enschmecktest/verkletttest`, mode `rwxrwxr--`
19. `einwitzs/aufgetraung/anfahren`, mode `--xr-x-wx`
20. `gekletts/angetrauen/gekatzet`, mode `rw-rwxr--`

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 2395 bytes long, while a compact script would be no larger than 956.

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
2396 bytes or more	0%
1676 – 2395 bytes	5%
957 – 1675 bytes	15%
813 – 956 bytes	25%
less than 813 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-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 `unit1-solution2.tgz`

1. `vertritts`, mode `-wx---rwx`, owner `news`, group `dip`
2. `gehaltung`, mode `--xrw--w-`, owner `mail`, group `audio`
3. `belaufkeit`, mode `r--rwxrwx`, owner `games`, group `mail`
4. `zerfahrtest`, mode `rwxrwx---`, owner `proxy`, group `fax`
5. `einrenntest`, mode `-w----rw-`, owner `uucp`, group `proxy`
6. `aufgekraung`, mode `r-xr--r--`, owner `uucp`, group `floppy`

7. angehaltheit, mode `-wxr-xr--`, owner `uucp`, group `fax`
8. aufwitzse, mode `----wx---`, owner `lp`, group `fax`
9. gehaltung/ausgesetztheit, mode `rw--w-r-x`, owner `lp`, group `uucp`
10. aufgekrautung/enfahrse, mode `r--rwx-w-`, owner `nobody`, group `floppy`
11. aufgekrautung/angeklett, mode `---r----x`, owner `mail`, group `news`
12. zerfahrtest/verwitzer, mode `-wxr-xrw-`, owner `lp`, group `mail`
13. zerfahrtest/anschmeckung, mode `rw----rw-`, owner `games`, group `tape`
14. aufgekrautung/enfahrse/verwitztete, mode `r--r--rwx`, owner `uucp`, group `news`
15. zerfahrtest/anschmeckung/anrabarbte, mode `--x-w-rw-`, owner `mail`, group `voice`
16. aufgekrautung/angeklett/aufpflumse, mode `-wx---rw-`, owner `nobody`, group `tape`
17. aufgekrautung/angeklett/anpflumtest, mode `rw-rw--wx`, owner `uucp`, group `fax`
18. aufgekrautung/angeklett/enfahrte, mode `-wxrwxrw-`, owner `mail`, group `student`
19. zerfahrtest/anschmeckung/bestehtest, mode `r-xrw--wx`, owner `lp`, group `news`
20. aufgekrautung/enfahrse/ausgesetzts, mode `-wxr---w-`, owner `news`, 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 2390 bytes long, while a compact script would be no larger than 1216.

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
2391 bytes or more	0%
1804 – 2390 bytes	5%
1217 – 1803 bytes	15%
1034 – 1216 bytes	25%
less than 1034 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-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 `unit1-solution3.tgz`

1. `aufgetritttete`, mode `-w-rwx---`, owner `uucp`, group `proxy`, `setuid`
2. `auslaufheit`, mode `r--rw-rwx`, owner `mail`, group `fax`
3. `zersinntest`, mode `-wx----w-`, owner `nobody`, group `news`
4. `zerwitzheit`, mode `--xr-----`, owner `proxy`, group `proxy`
5. `enpflumtest`, mode `r---w-r--`, owner `games`, group `dip`, `setuid`
6. `zerhundkeit`, mode `-wxr-----`, owner `lp`, group `voice`
7. `ausgekaess`, mode `---r----x`, owner `news`, group `mail`, `setuid`
8. `verwarfs`, mode `rw---x--x`, owner `uucp`, group `news`
9. `enpflumtest/ausssprachheit`, mode `r---w-r-x`, owner `student`, group `voice`
10. `aufgetritttete/ausstehs`, mode `----wxrwx`, owner `mail`, group `dip`, `setuid`
11. `enpflumtest/aufgepflumtest`, mode `---rwxr--`, owner `news`, group `uucp`

12. `ausgekaess/zerrenntete`, mode `-----wx`, owner `news`, group `tape`
13. `zerwitzheit/anpflumte`, mode `-wx--xrw-`, owner `uucp`, group `fax`, `setuid`
14. `enpflumtest/aussprachheit/ausrabarbarkeit`, mode `--xr-x-w-`, owner `mail`, group `mail`, `setuid`
15. `enpflumtest/aussprachheit/berennung`, mode `rwx----wx`, owner `student`, group `dip`, `setuid`
16. `zerwitzheit/anpflumte/ansitzst`, mode `rw-rw-rwx`, owner `nobody`, group `proxy`, `setuid`
17. `enpflumtest/aussprachheit/auskaest`, mode `rwxr-xrwx`, owner `student`, group `voice`, `setuid`
18. `enpflumtest/aufgepflumtest/ausgehalter`, mode `-wx---r-x`, owner `lp`, group `mail`, `setuid`
19. `zerwitzheit/anpflumte/angesteher`, mode `-w----r--`, owner `lp`, group `audio`, `setuid`
20. `zerwitzheit/anpflumte/auflauftete`, mode `rw-rwxrw-`, owner `lp`, group `uucp`, `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 2445 bytes long, while a compact script would be no larger than 1228.

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
2446 bytes or more	0%
1837 – 2445 bytes	5%
1229 – 1836 bytes	15%
1044 – 1228 bytes	25%
less than 1044 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-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 `unit1-solution4.tgz`

1. `aufsetzen`, mode `-wx---r--`, group `audio`, `setgid`
2. `enwarft`, mode `----wxr--`, group `fax`, `setgid`
3. `gesetzte`, mode `rw-r-xr--`, group `uucp`
4. `angesetzst`, mode `-w-rw--wx`, group `cdrom`, `setgid`
5. `ansprachen`, mode `-----xr--`, group `dip`
6. `ausgesinnkeit`, mode `--x---r-x`, group `cdrom`
7. `ausgefaharte`, mode `r-xrwxr--`, group `student`
8. `angetrauuung`, mode `rw-r--r--`, group `cdrom`
9. `angetrauuung/einsinnen`, mode `rwx---rw-`, group `floppy`
10. `ansprachen/verwitzs`, mode `r--rwxrwx`, group `mail`, `setgid`
11. `angesetzst/aufsprachs`, mode `r----xrw-`, group `audio`, `setgid`
12. `gesetzte/ensitzkeit`, mode `---r---wx`, group `tape`, `setgid`
13. `ausgefaharte/anwitzkeit`, mode `r-----rw-`, group `floppy`
14. `ausgefaharte/anwitzkeit/bekatzeeer`, mode `-w--wx--x`, group `dip`
15. `angesetzst/aufsprachs/verkraus`, mode `---r----x`, group `uucp`, `setgid`
16. `ansprachen/verwitzs/aufkraus`, mode `--xrw-r--`, group `student`
17. `ausgefaharte/anwitzkeit/angehundse`, mode `rwx---w-`, group `cdrom`
18. `angetrauuung/einsinnen/ausgesitzte`, mode `-wx-wxrw-`, group `tape`

19. `angesetzst/aufsprachs/angesitzst`, mode `-----rwx`, group `voice`, `setgid`
20. `ausgefaharte/anwitzkeit/verkaesse`, mode `-----xrw`, group `uucp`

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 2375 bytes long, while a compact script would be no larger than 1109.

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
2376 bytes or more	0%
1743 – 2375 bytes	5%
1110 – 1742 bytes	15%
943 – 1109 bytes	25%
less than 943 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-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 **voice** group, **read from** the file `/geschmeckse/enwurfung/zerlaufst`? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x-w-rwx    news    cdrom    0 geschmeckse
│
│   └─ (2)   d--x---r-x    uucp    mail     0 enwurfung
│
│       └─ (3) --w-r-xr--  proxy    dip     0 zerlaufst

```

5.2

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

```

/
├─ (1)      d---rw-r-x    student    mail     0 einhundertete
│
│   └─ (2)   dr-x--xrw-    news    voice    0 enschmeckst
│
│       └─ (3) --wxrw-rwx  news    proxy    0 anstehkeit

```

5.3

Can the user **games**, who is a member of the **tape** group, **write to** the file `/einklettkeit/auftritts/ausgewarfkeit`? If not, which of the three directories blocks access (Y|1|2|3)


```

/
├─ (1)      d---r-xr-x    mail    floppy    0 einklettkeit
│   └─ (2)      d--xrw-x student    tape      0 auftritts
│       └─ (3)  ---x--xrw-    games      dip      0 ausgewarfkeit

```

5.4

Can the user **nobody**, who is a member of the **dip** group, **execute** the file **/zerkletter/aufkatzest/aufsinner**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-w-rw-r-x    proxy     fax      0 zerkletter
│   └─ (2)      dr--rwxrwx  uucp      dip      0 aufkatzest
│       └─ (3)  -r--rw---x  nobody  student  0 aufsinner

```

5.5

Can the user **games**, who is a member of the **uucp** group, **read from** the file **/aufgekrauen/enschmeckkeit/gestehtete**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwx-w-----  games     fax      0 aufgekrauen
│   └─ (2)      drwxr--rwx  nobody  student  0 enschmeckkeit
│       └─ (3)  -rw--w-rwx  games     news     0 gestehtete

```

5.6

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

```

/
├─ (1)      d-wxr-x-w-    proxy     cdrom    0 anwarfkeit
│   └─ (2)      drwxr--rw- student  student  0 einsprachung
│       └─ (3)  ---x-w--w-    proxy     floppy   0 verhundtest

```

5.7

Can the user **games**, who is a member of the **dip** group, **read from** the file **/angehundkeit/aufgelaufetest/engehen**? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drwxrwx--x   games   cdrom    0 angehundkeit
│   └─ (2)   dr-x----- nobody   dip      0 aufgelaufetest
│       └─ (3) -rwxr-xr-- games student  0 engehen
```

5.8

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

```
/
├─ (1)      dr-xr---wx   uucp    voice    0 versprachte
│   └─ (2)   drwx---rwx   news    tape      0 enrennt
│       └─ (3) -r-xrwxrwx games    tape      0 gekraut
```

5.9

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

```
/
├─ (1)      drwxrwx-wx   student floppy    0 gewitzst
│   └─ (2)   d--x---r-x   uucp    floppy    0 verstehen
│       └─ (3) ---x---rwx proxy    tape      0 aufgekletter
```

5.10

Can the user **games**, who is a member of the **audio** group, **execute** the file **/besetztheit/gerabarbung/aufwarftete**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr--r-xrw-   nobody   audio   0 besetztheit
│
│   └─ (2)    drwxrwx-w-    lp      audio   0 gerababung
│       └─ (3) --wxr-xrwx   news     news    0 aufwarftete

```

5.11

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

```

/
├─ (1)      d-wxrwxrw-    news     fax      0 berenntete
│
│   └─ (2)    d-wxrwx---   games    fax      0 gehundung
│       └─ (3) -rw--w-r-x  news     student  0 angesetzung

```

5.12

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

```

/
├─ (1)      drwx-w----   student  student  0 enwitzkeit
│
│   └─ (2)    d---r-xr-x    lp        fax      0 gesetztete
│       └─ (3) -rwx-wx-wx   news     student  0 einkaesst

```

5.13

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

```

/
├─ (1)      d-wx-w-rwx   games    floppy   0 berennkeit
│
│   └─ (2)    dr-x-w----   uucp      voice    0 zersetzen
│       └─ (3) -r--rwxrwx  uucp      audio    0 ausgehundtest

```

5.14

Can the user **proxy**, who is a member of the **fax** group, **execute** the file `/aushundheit/aufsetzheit/ausgekraukeit`? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      d--xrwx-w-   games   cdrom   0 aushundheit
│   └─ (2)      d-wx-w-r-x student   tape   0 aufsetzheit
│       └─ (3) -r-xrw--wx   proxy   floppy  0 ausgekraukeit
```

5.15

Can the user **nobody**, who is a member of the **mail** group, **execute** the file `/aufwarfs/einwarftete/aufgepflumtete`? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      d-----xrwx   proxy   voice   0 aufwarfs
│   └─ (2)      drw-rw-r-x   uucp    tape   0 einwarftete
│       └─ (3) -r---wx---x   nobody  proxy   0 aufgepflumtete
```

5.16

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

```
/
├─ (1)      dr-xrwxrwx     uucp     uucp     0 ausgesprachst
│   └─ (2)      dr-x-----x proxy     uucp     0 angestehheit
│       └─ (3) -r---w-rw-   games     uucp     0 aushundkeit
```

5.17

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

```

/
├─ (1)      drw-r-xr--    uucp    news    0 aufgekaesst
│   └─ (2)      drwx---rwx    mail    audio    0 verspracher
│       └─ (3) -rwx-wx-wx    news    student    0 austrittkeit

```

5.18

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

```

/
├─ (1)      drwx---r--    news    voice    0 aufgehung
│   └─ (2)      drwxr--r--    news    audio    0 beschmeckse
│       └─ (3) --w-r-xr-x    student    floppy    0 angekrauer

```

5.19

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

```

/
├─ (1)      drw-r--rwx    games    news    0 einsinnse
│   └─ (2)      d--xrwxrw-    news    student    0 enlaufheit
│       └─ (3) -r--r-xr-x    mail    student    0 angewarfst

```

5.20

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

```

/
├─ (1)      drwx----w-    uucp    fax    0 einpflumung
│   └─ (2)      dr-----rwx    student    news    0 aufgehtete
│       └─ (3) ----r---wx    proxy    audio    0 ansetzkeit

```

5.21

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

```
/
├─ (1)      dr-x--xrw-   mail    news    0 einrabarbte
│   └─ (2)      dr--rwx--- student  voice    0 ausfahren
│       └─ (3)  --w-rw-r--  games    voice    0 einsetzst
```

5.22

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

```
/
├─ (1)      dr-x----w-   mail    floppy  0 ensinnung
│   └─ (2)      drwx---rw- proxy  student  0 ansinnst
│       └─ (3)  -rwx--x---  mail     tape    0 angekatzest
```

5.23

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

```
/
├─ (1)      drwx---rwx  student     fax    0 ausgehundung
│   └─ (2)      d--xrw-rwx student     fax    0 vertrautete
│       └─ (3)  -r-x-wx--x student  floppy  0 engehst
```

5.24

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

```

/
├─ (1)      d-w-rwx---  nobody    news      0 angekrauen
  │
  └─ (2)      drwx-wx-w-   games     news      0 aufgepflums
    │
    └─ (3)     -rw--wx-wx   games     news      0 gesinnse

```

5.25

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

```

/
├─ (1)      drw-rwxrwx   proxy   student    0 aussinnt
  │
  └─ (2)      drw-rwxrwx   mail     voice      0 angerauchtest
    │
    └─ (3)     -----wxrwx  games      fax      0 entstehung

```

5.26

Can the user **proxy**, who is a member of the **voice** group, **write to** the file **/gekaeste/angegehen/zerklettheit**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr--rwx-w-   student   voice      0 gekaeste
  │
  └─ (2)      drwx-wxrwx  student   mail      0 angegehen
    │
    └─ (3)     -rw-rwxrwx  proxy     audio     0 zerklettheit

```

5.27

Can the user **lp**, who is a member of the **voice** group, **execute** the file **/anrauchst/eintrauer/angestehtete**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwxrwx-wx    lp        cdrom      0 anrauchst
  │
  └─ (2)      dr-----r-x  uucp     audio      0 eintrauer
    │
    └─ (3)     ----r-x-wx   mail     voice     0 angestehtete

```

5.28

Can the user **mail**, who is a member of the **voice** group, **write to** the file **/ausgefahrtheit/aufsitzt/ausgepflumtest**? If not, which of the three direc-

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

```

/
├─ (1)      dr-x-w-rwx    news  student    0  ausgefahrheit
│   └─ (2)  drwxrwx-w-   mail  student    0  aufsitzt
│       └─ (3) --w----- mail   proxy     0  ausgepflumtest

```

5.29

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

```

/
├─ (1)      drw-r--rwx    mail   mail       0  ausgesprachtest
│   └─ (2)  d----wxr-x    news   audio      0  ausschmeckkeit
│       └─ (3) ---x-wxr-x  games  mail       0  einsprachen

```

5.30

Can the user **nobody**, who is a member of the **tape** group, **read from** the file /verlaufheit/einwarfkeit/anhaltkeit? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      dr-x----w-    news   uucp       0  verlaufheit
│   └─ (2)  drwxrw-r-x    mail   mail       0  einwarfkeit
│       └─ (3) -rw-r-x-w-  news   tape       0  anhaltkeit

```

5.31

Can the user **games**, who is a member of the **proxy** group, **read from** the file /auskatzese/behunder/einwarfs? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      d-w--wxrwx    news   tape       0  auskatzese
│   └─ (2)  d--xr--r-x    uucp    uucp       0  behunder
│       └─ (3) -r-----x  games  cdrom      0  einwarfs

```


5.32

Can the user **nobody**, who is a member of the **mail** group, **write to** the file `/aufgehaltte/zerkatzetest/ausrenntete`? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      d--xrw-r-x      lp      dip      0 aufgehaltte
│   └─ (2)   drwx-w-r--      nobody   voice    0 zerkatzetest
│       └─ (3) ---x-w--wx      proxy    mail     0 ausrenntete
```

5.33

Can the user **nobody**, who is a member of the **news** group, **execute** the file `/angefahrst/ausgeklettt/enkatzete`? If not, which of the three directories blocks access (Y|1|2|3)

```
/
├─ (1)      drw-rwxrwx      games     news     0 angefahrst
│   └─ (2)   drwx-wx-w-      nobody    voice    0 ausgeklettt
│       └─ (3) -rw-rwxr--      uucp      news     0 enkatzete
```

5.34

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

```
/
├─ (1)      drwx--x---      games     student   0 aufgewitzst
│   └─ (2)   drwx-wxr-x      lp        cdrom    0 ausgefahren
│       └─ (3) -rwx--x--x      lp        dip     0 aussinnkeit
```

5.35

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

```

/
├─ (1)      dr-x--x---      mail    voice    0 gesetzzeit
│   └─ (2)  dr-xrwx---      student  student  0 aufgestehung
│       └─ (3) -r-xrwx---      mail    tape     0 einkaess

```

5.36

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

```

/
├─ (1)      drwxr--r--      mail    student  0 verlauffer
│   └─ (2)  dr-xr-x---      nobody   voice    0 angelaufheit
│       └─ (3) --wx--xrwx    nobody   news     0 aufgerauchkeit

```

5.37

Can the user **nobody**, who is a member of the **audio** group, **write to** the file **/auffahrst/ausgekatztst/angesprochen**? If not, which of the three directories blocks access (Y|1|2|3)

```

/
├─ (1)      drwxrwxrw-      proxy    audio    0 auffahrst
│   └─ (2)  drwxrwx-w-      nobody   student  0 ausgekatztst
│       └─ (3) -rwxrw--w-    nobody   uucp     0 angesprochen

```

5.38

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

```

/
├─ (1)      drwx-w---wx      uucp     uucp     0 enklettst
│   └─ (2)  drwxr-xr--      uucp     cdrom    0 aufgewitzse
│       └─ (3) -----wx---    news    student  0 einrabarbt

```

5.39

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

```

/
├─ (1)      drwx--x---      news      uucp      0 zersteher
│
│   └─ (2)   d-wx-w-rwx      lp student      0 auswitzheit
│
│       └─ (3) -rwxr-xrwx      mail student      0 gepflumse
```

5.40

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

```

/
├─ (1)      dr-x--x-w-      nobody student      0 beklettt
│
│   └─ (2)   drwx-w-rw-      uucp student      0 einhalte
│
│       └─ (3) -----w-rwx      news      tape      0 ensetzse
```

Hash for checking if you have all 40 correct

4d7356f98b636b410949ce8b2b24f0828e0190cdd5d741ed2131fbb26e415a5a

You can check your result with a command like:

```
echo "2YY13YY2YYYYY3Y3YY2Y22YY11Y2Y1YY2YYY3Y3YY" | \
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.