Using UNIX
on the commandline

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UNIX

Command line

Exercises

ORACLE®

openSUSE®

CentOS

Gentoo: https://de.wikipedia.org/wiki/Gentoo_Linux#/media/Datei:Gentoo_Linux_logo_matte.svg; 13.08.19
ORACLE: https://upload.wikimedia.org/wikipedia/commons/thumb/5/50/Oracle_logo.svg/1920px-Oracle_logo.svg.png; 13.08.19
openSuse: https://gitorious.org/opensuse/art/source/ecbe9f96fa4c6d2e5d1ac18a403587f925c136a5:00assets/logo/official-logo-color.svg; 13.08.19
CentOS: https://de.wikipedia.org/wiki/CentOS#/media/Datei:CentOS-Logo.svg; 13.08.19
Rasbian: https://de.wikipedia.org/wiki/Raspberry_Pi#/media/Datei:Raspberry_Pi_Logo.svg; 13.08.19

UNIX

OpenClipart-Vectors (Pixabay)

Unix

Windows

C:

D:

E:

OpenClipart-Vectors (Pixabay)

Software: Packages

and FTP client for Windows.

u by:

views

31,635 This Week

Jpdate: 2019-07-21

Kaffee-Miete fü
So zahlen Sie f
kaffeevollautomaten

WinSCP is a pop… lient for Windows, a powerful file manag… ctivity. It offers an easy to use GUI to copy files be… ter using multiple protoc… FTP or WebDAV. Power users can automate WinSCP usi…

Features

- All common operations with files
- Scripting and task automation with batch file

Users, groups and the boss….

root

- can do **ANYTHING**

users

- constrained
- organized in groups
- **s**ubstitute **u**ser **do**

sudo rm importantFile

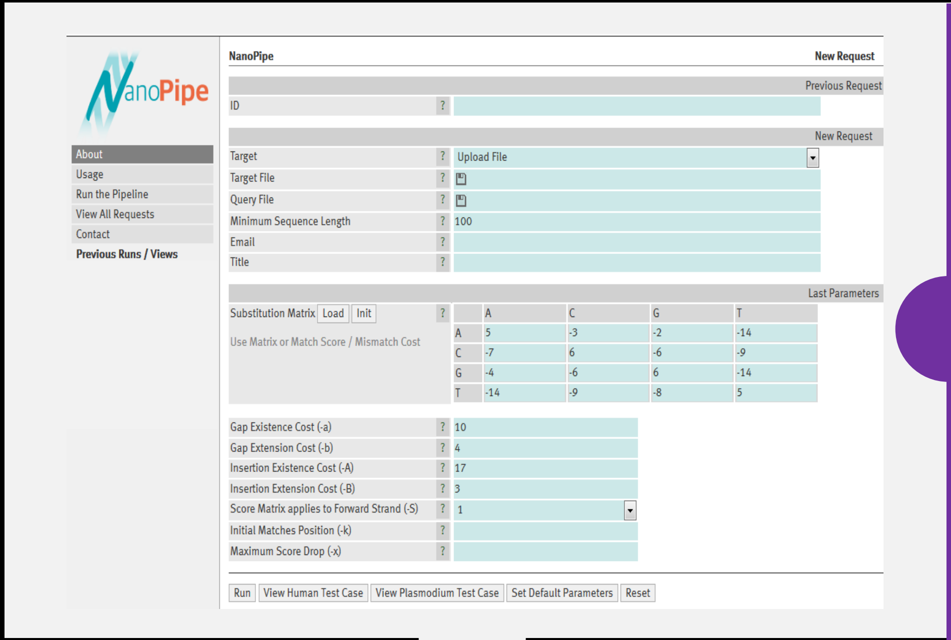
PublicDomainPictures (Pixabay)

Respect

Think

Mind

Command line



NanoPipe **New Request**

Previous Request

ID	?	

New Request

Target	?	Upload File
Target File	?	
Query File	?	
Minimum Sequence Length	?	100
Email	?	
Title	?	

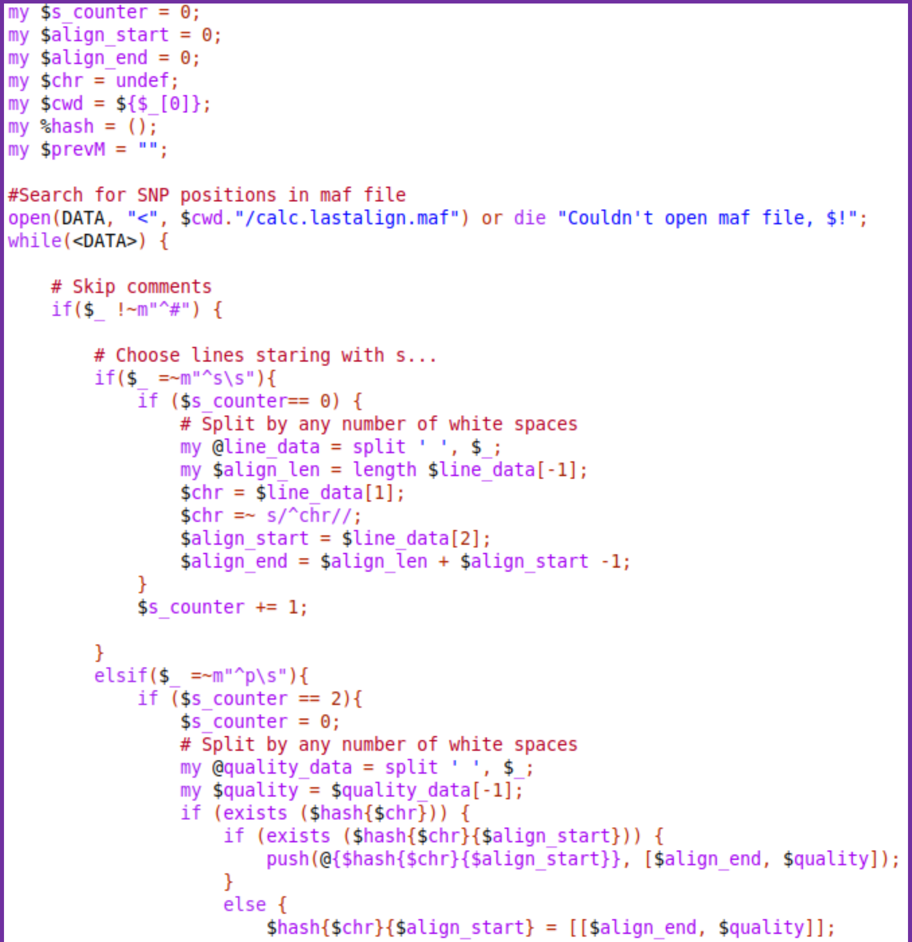
Last Parameters

Substitution Matrix Load Init ?

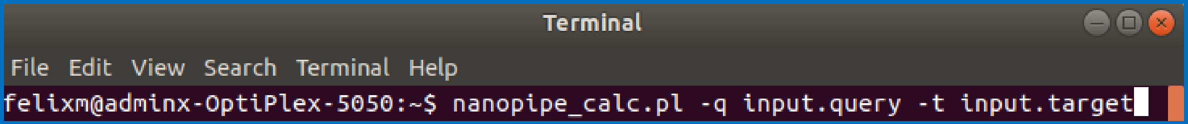
Use Matrix or Match Score / Mismatch Cost

	A	C	G	T
A	5	-3	-2	-14
C	-7	6	-6	-9
G	-4	-6	6	-14
T	-14	-9	-8	5

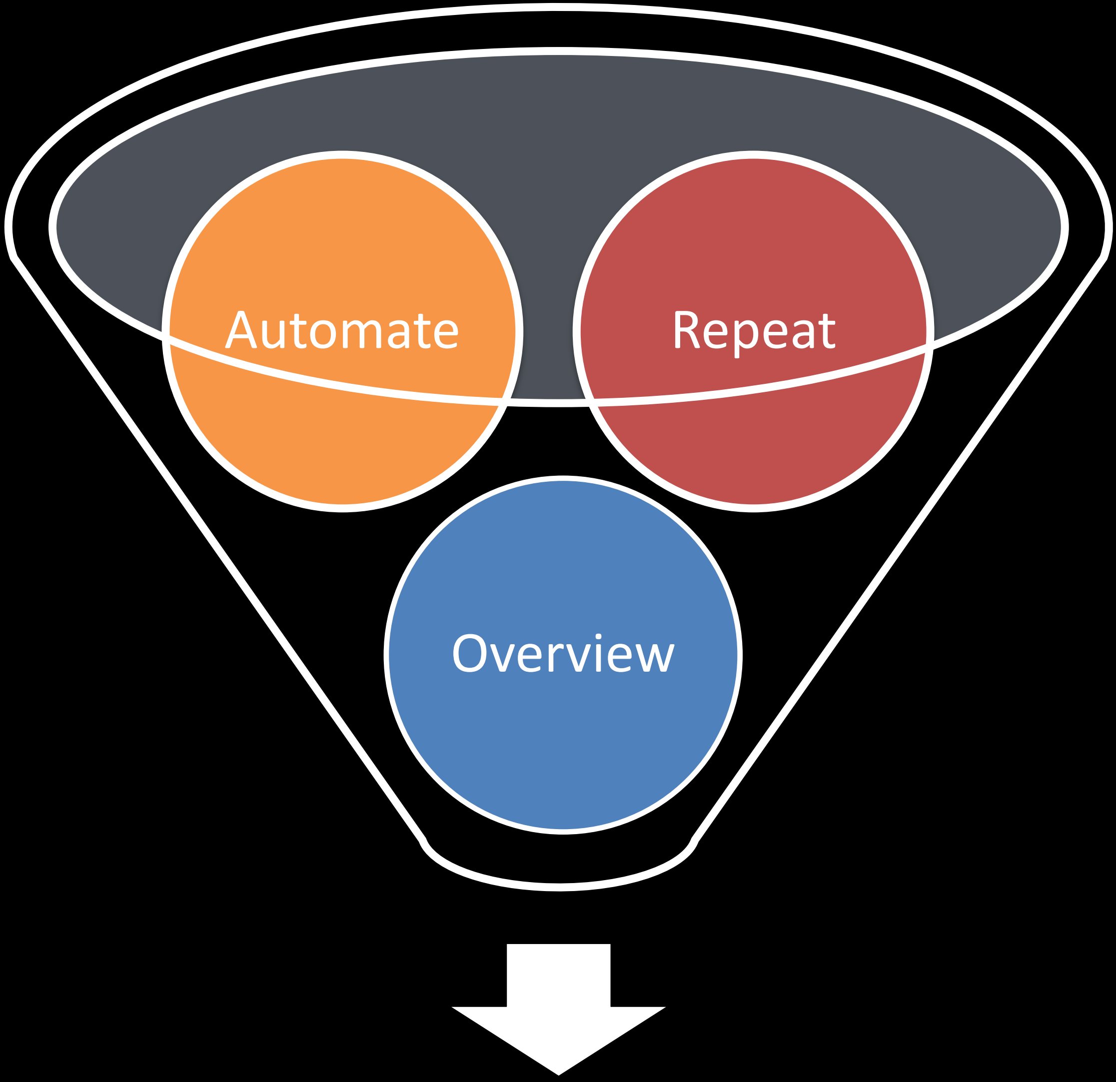
Gap Existence Cost (-a)	?	10
Gap Extension Cost (-b)	?	4
Insertion Existence Cost (-A)	?	17
Insertion Extension Cost (-B)	?	3
Score Matrix applies to Forward Strand (-S)	?	1
Initial Matches Position (-k)	?	
Maximum Score Drop (-x)	?	



```perl
my $s_counter = 0;
my $align_start = 0;
my $align_end = 0;
my $chr = undef;
my $cwd = ${$_[0]};
my %hash = ();
my $prevM = "";

#Search for SNP positions in maf file
open(DATA, "<", $cwd."/calc.lastalign.maf") or die "Couldn't open maf file, $!";
while(<DATA>) {

    # Skip comments
    if($_ !~m"^#") {

        # Choose lines staring with s...
        if($_ =~m"^s\s"){
            if ($s_counter== 0) {
                # Split by any number of white spaces
                my @line_data = split ' ', $_;
                my $align_len = length $line_data[-1];
                $chr = $line_data[1];
                $chr =~ s/^chr//;
                $align_start = $line_data[2];
                $align_end = $align_len + $align_start -1;
            }
            $s_counter += 1;

        }
        elsif($_ =~m"^p\s"){
            if ($s_counter == 2){
                $s_counter = 0;
                # Split by any number of white spaces
                my @quality_data = split ' ', $_;
                my $quality = $quality_data[-1];
                if (exists ($hash{$chr})) {
                    if (exists ($hash{$chr}{$align_start})) {
                        push(@{$hash{$chr}{$align_start}}, [$align_end, $quality]);
                    }
                    else {
                        $hash{$chr}{$align_start} = [[$align_end, $quality]];
```

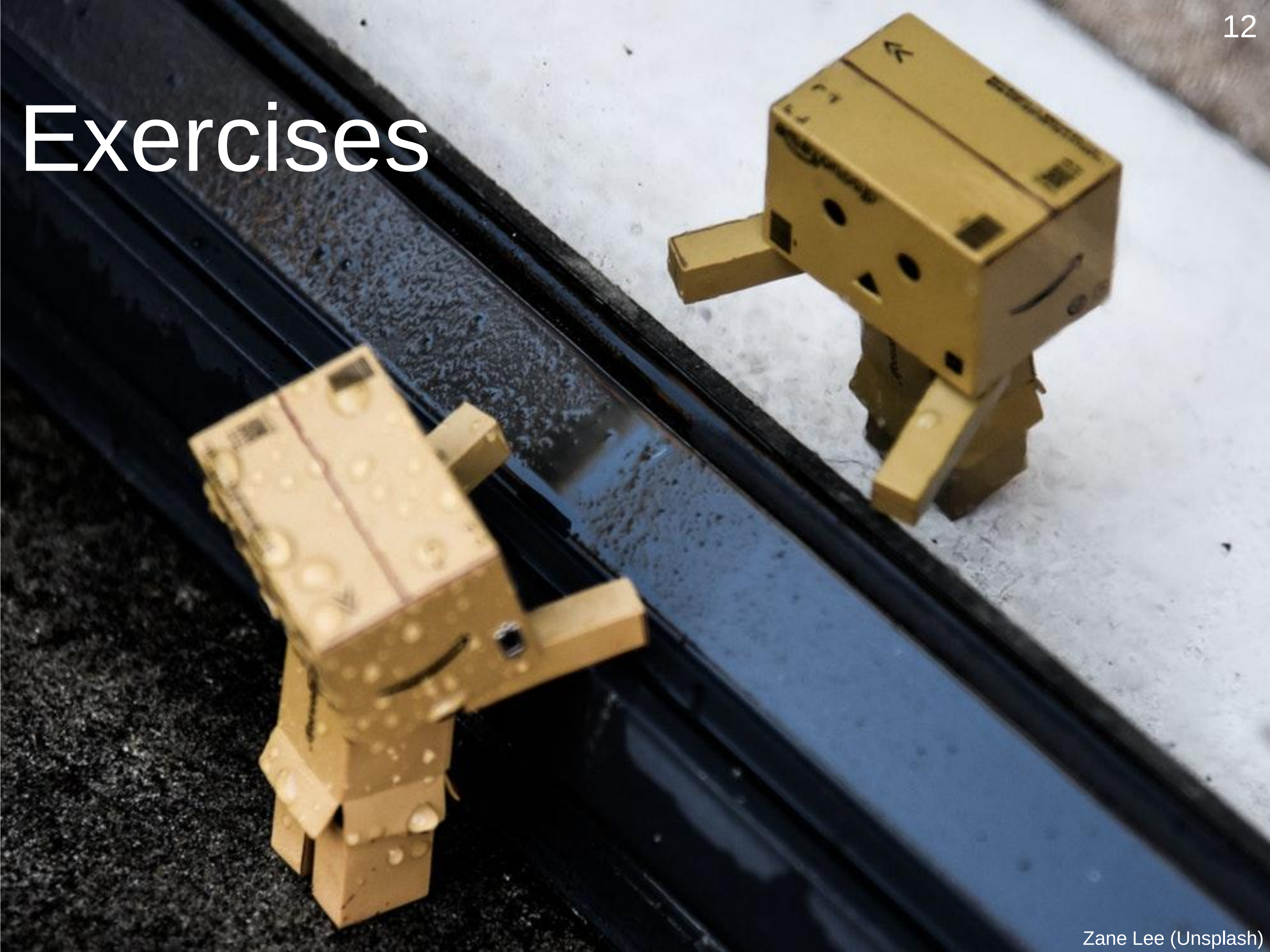


```
felixm@adminx-OptiPlex-5050:~$ nanopipe_calc.pl -q input.query -t input.target
```



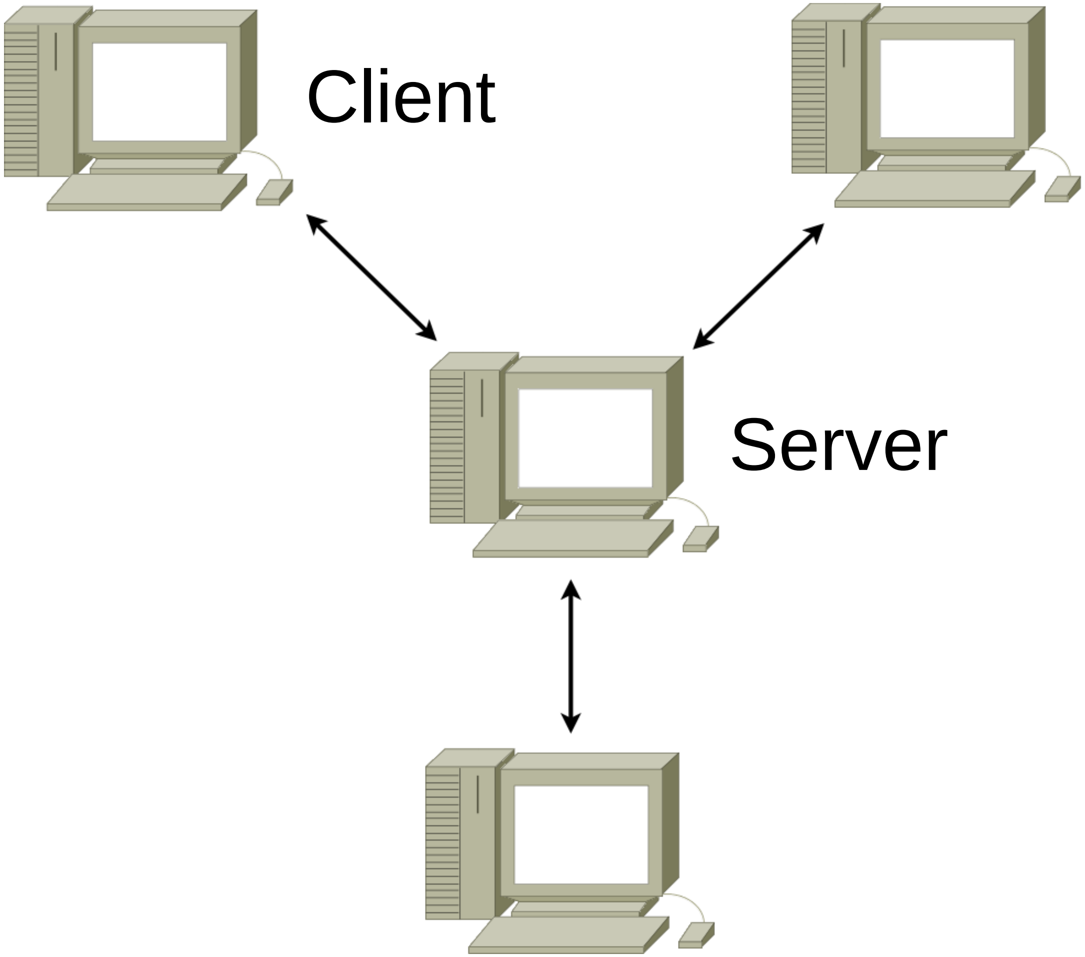
Fast

Exercises



Zane Lee (Unsplash)

What is a server?

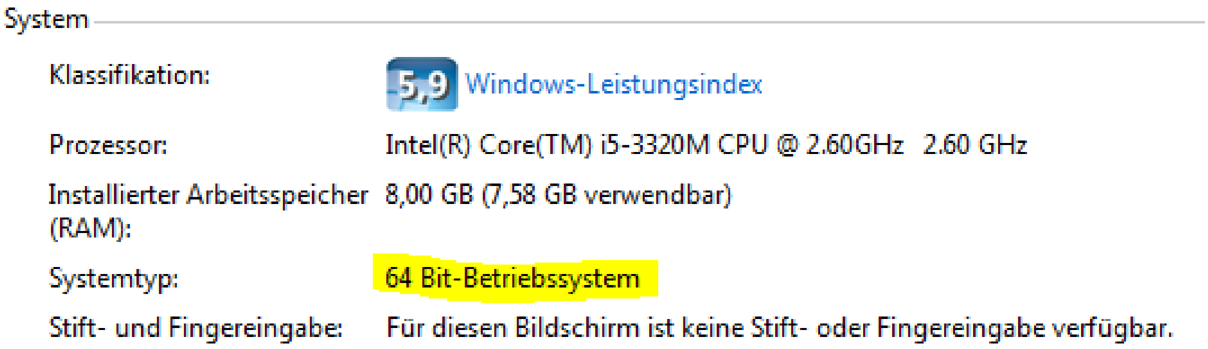


Client

Server

Windows

- Check bit version of Windows
  - Search for “system” using the search tool
  - Check the entry for system type



System

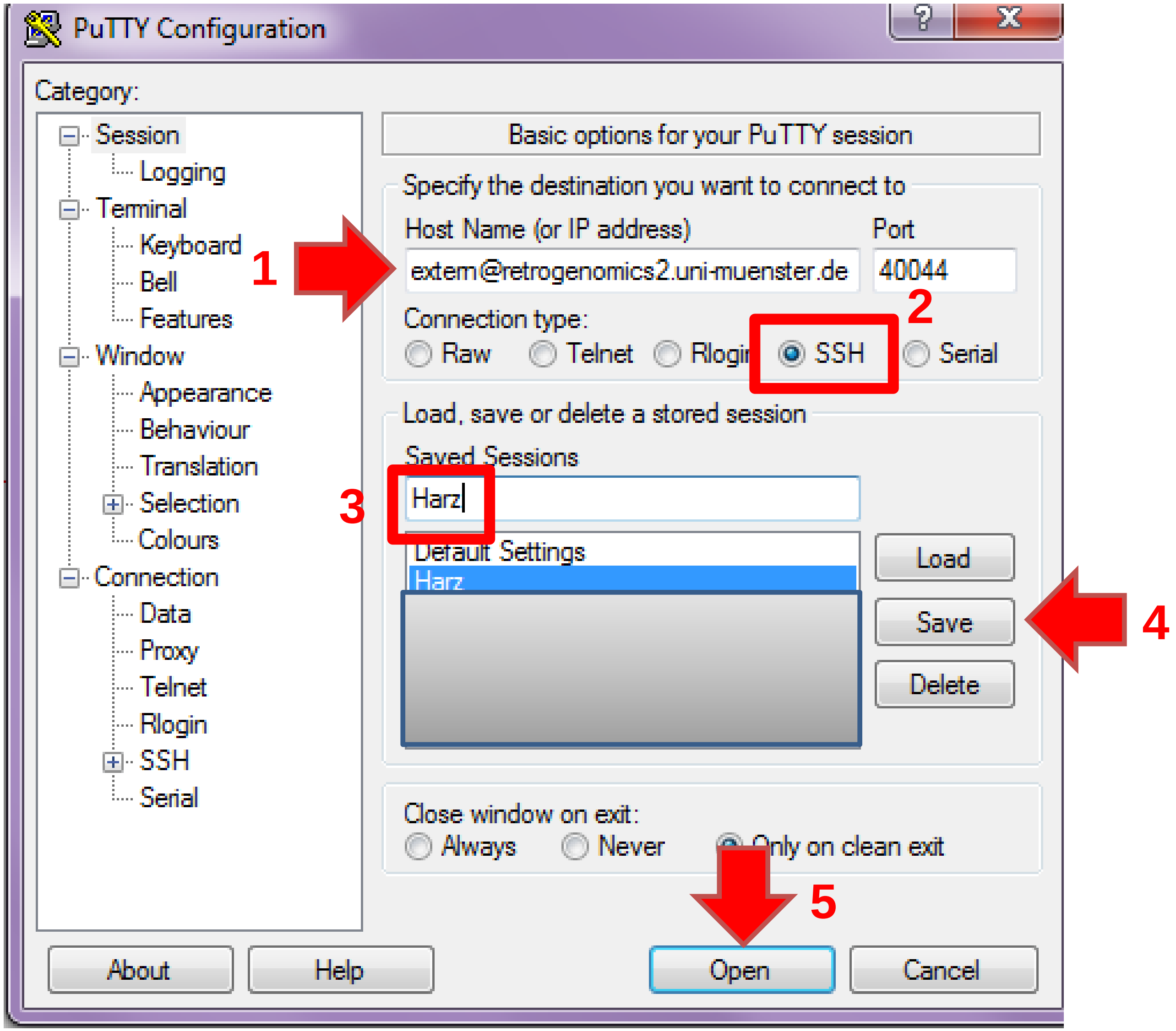
Klassifikation:	5,9 Windows-Leistungsindex
Prozessor:	Intel(R) Core(TM) i5-3320M CPU @ 2.60GHz 2.60 GHz
Installierter Arbeitsspeicher (RAM):	8,00 GB (7,58 GB verwendbar)
Systemtyp:	64 Bit-Betriebssystem
Stift- und Fingereingabe:	Für diesen Bildschirm ist keine Stift- oder Fingereingabe verfügbar.

Windows

- Download and install PuTTY:
  - **32-bit:**

    https://the.earth.li/~sgtatham/putty/latest/w32/putty-0.72-installer.msi
  - **64-bit (usually OK):**

    https://the.earth.li/~sgtatham/putty/latest/w64/putty-64bit-0.72-installer.msi



Specify the destination you want to connect to

Host Name (or IP address): extern@retrogenomics2.uni-muenster.de

Port: 40044

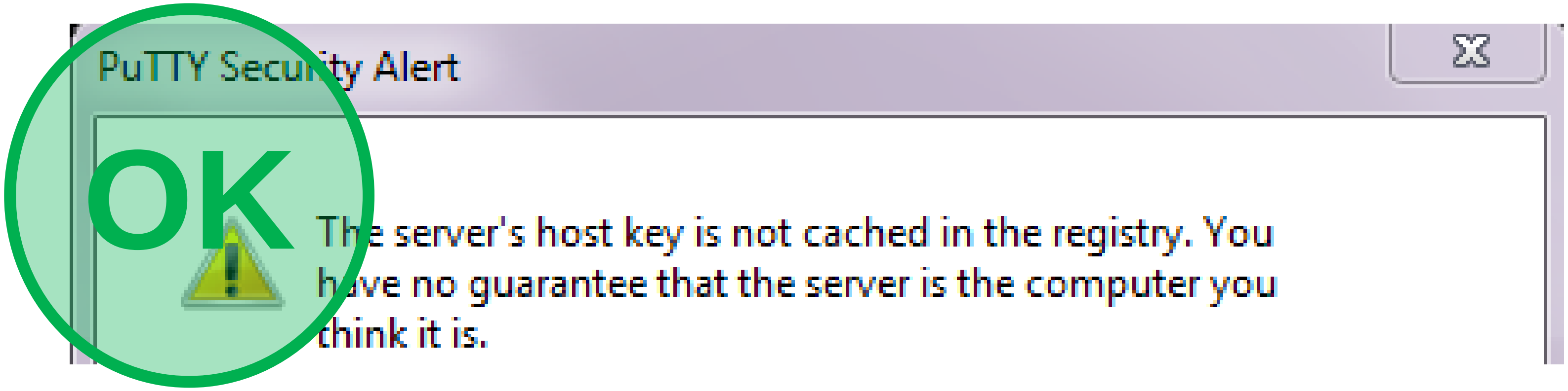
Connection type: ○ Raw ○ Telnet ○ Rlogin ● SSH ○ Serial

Load, save or delete a stored session

Saved Sessions: Harz

Default Settings
Harz

Close window on exit: ○ Always ○ Never ● Only on clean exit



PuTTY Security Alert

The server's host key is not cached in the registry. You have no guarantee that the server is the computer you think it is.

UNIX/Mac

```
ssh –p 40044 extern@retrogenomics2.uni-muenster.de
```

Mia Baker (Unsplash)

Joe Munroe (1959)

Home folder

li**s**t all items

ls

ls -l

put empty file

touch calender.txt

view one item

less calender.txt

print **w**orking **d**irectory

pwd

Alexa Williams (Unsplash)

↓↑ browse history

↔ auto complete

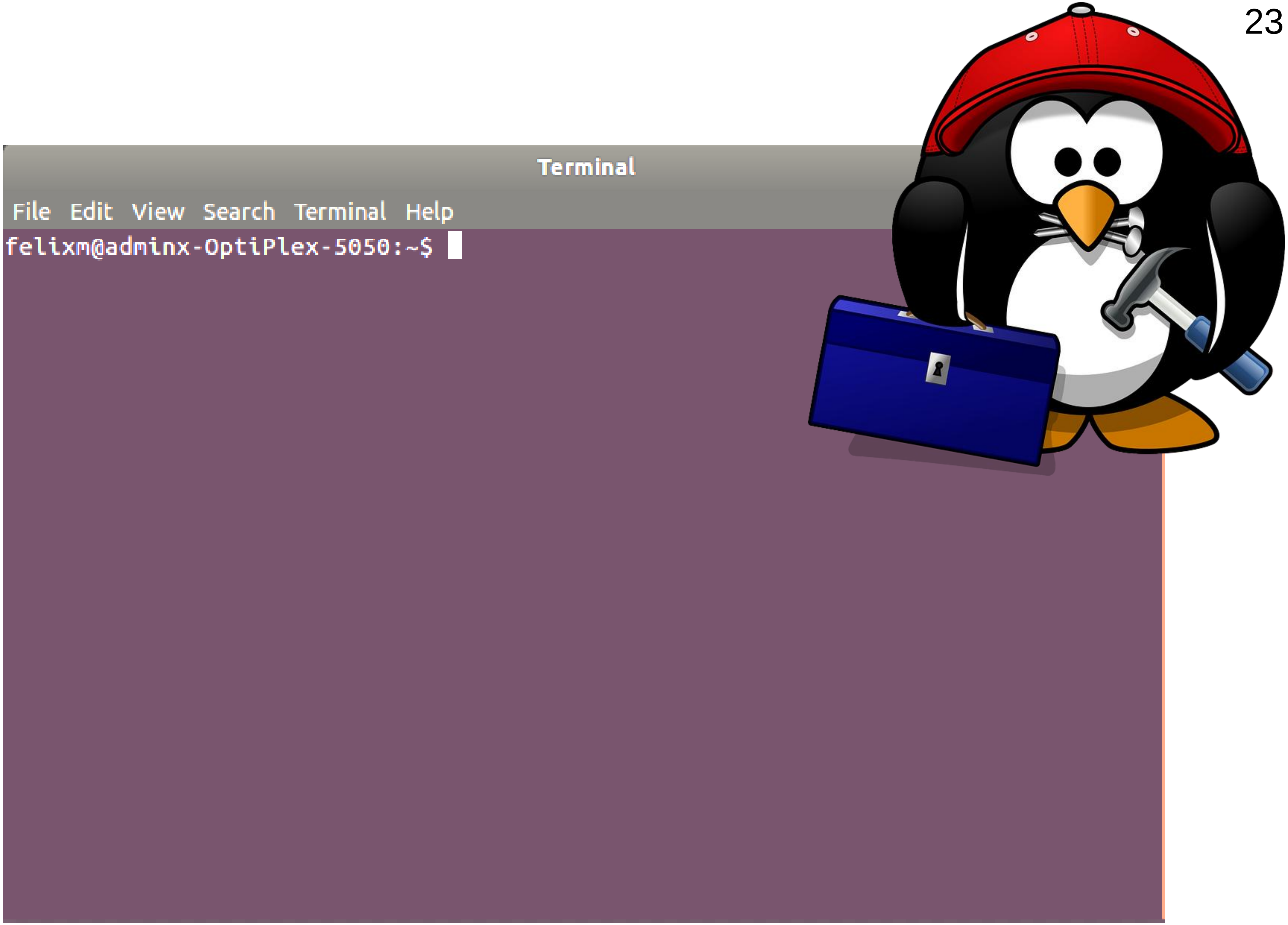
ls ≠ **LS** ≠ **Ls**

man [command] for help

top / **htop**: processes

ctrl + c abort

AbsolutVision (Unsplash)



```
felixm@adminx-OptiPlex-5050:~$
```

OpenClipart-Vectors (Pixabay)

Absolute path

/building/top/hallway/1stLeft

Boss

Relative path

../../../top/hallway/1stLeft

You

/building/18th/hallway/home

Element5 Digital (Unsplash)

To boss

change **d**irectory

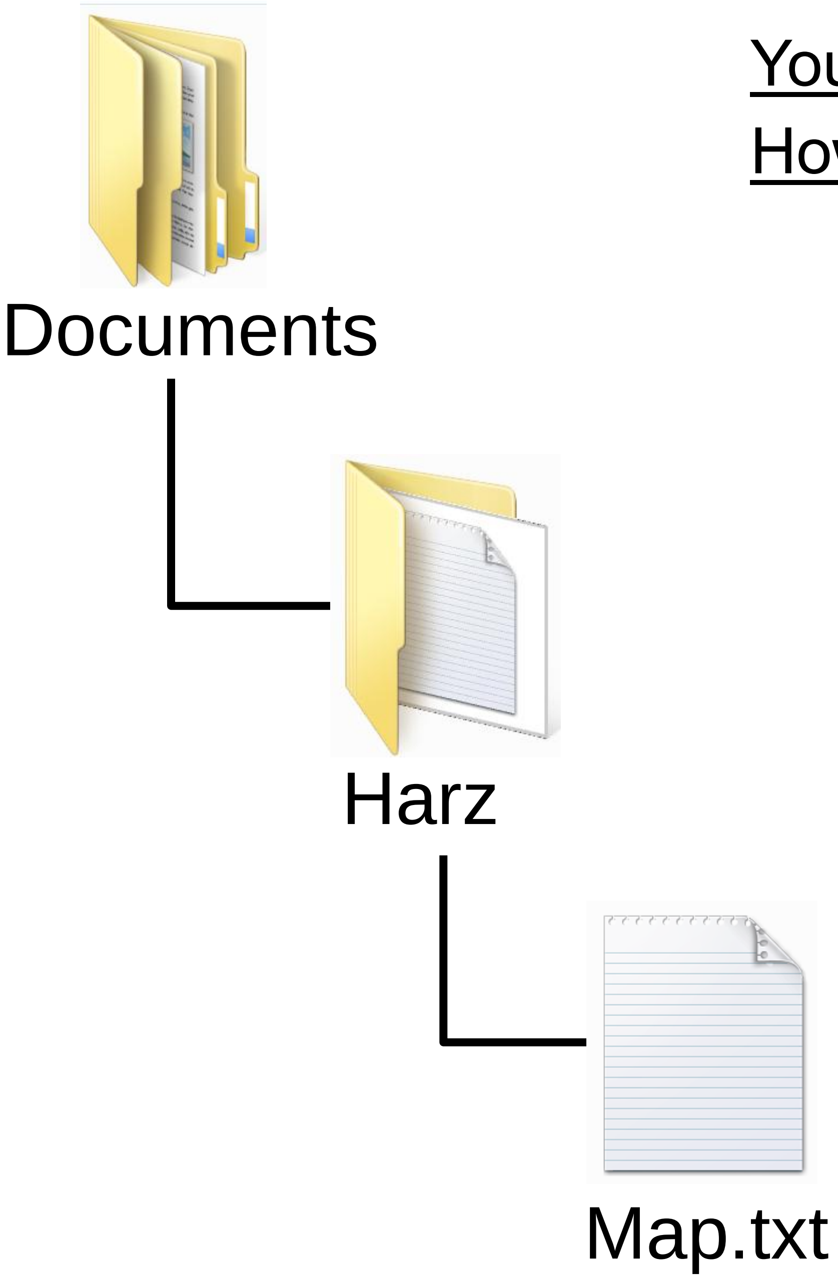
```
cd  /building/top/hallway/1stLeft
```

```
cd ../../../topFloor/hallway/1stLeft
```

Back

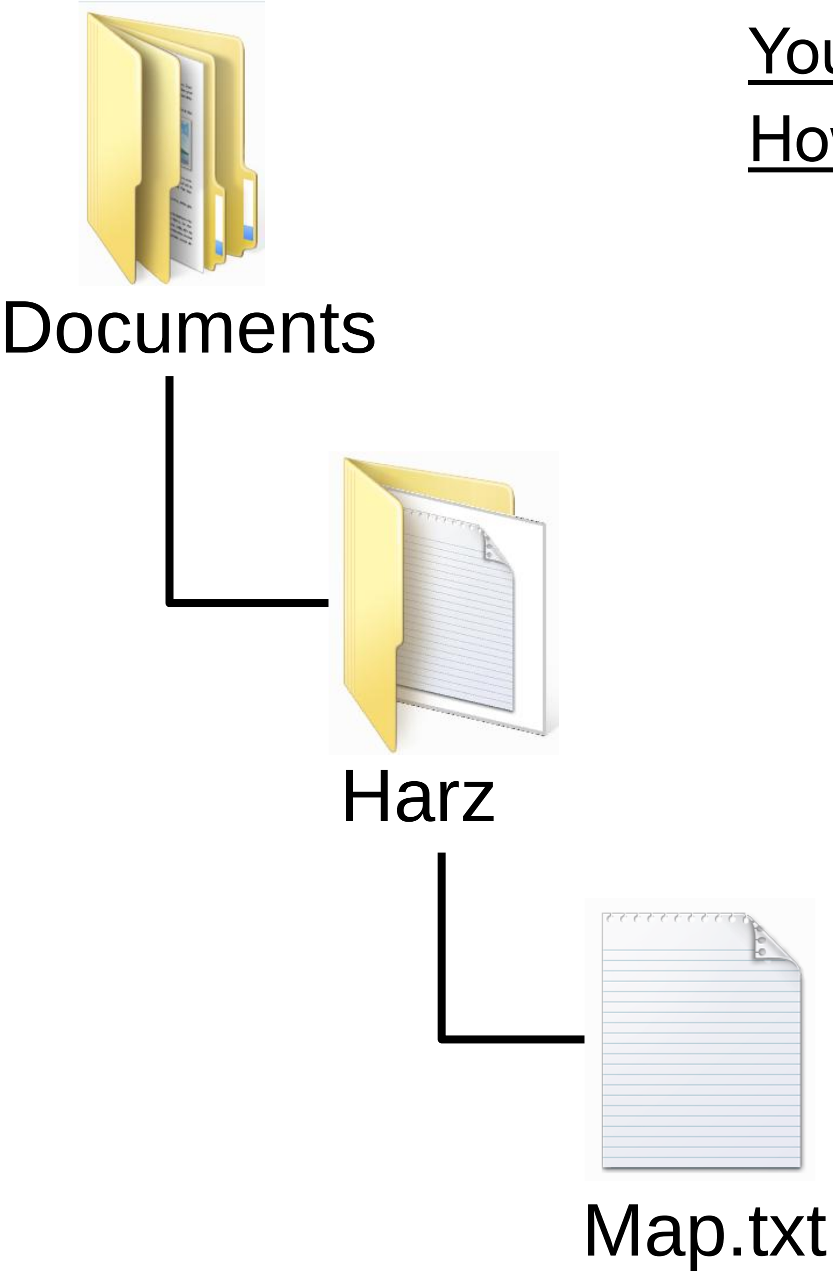
change **d**irectory

```
cd  /building/18th/hallway/home

cd ../../../18th/hallway/home

cd –

cd
```



You are in the “Documents” folder.
How do you enter the “Harz” folder?

A: pwd
B: cd ..
C: cd Harz ✓
D: less Harz



Documents

Harz

Map.txt

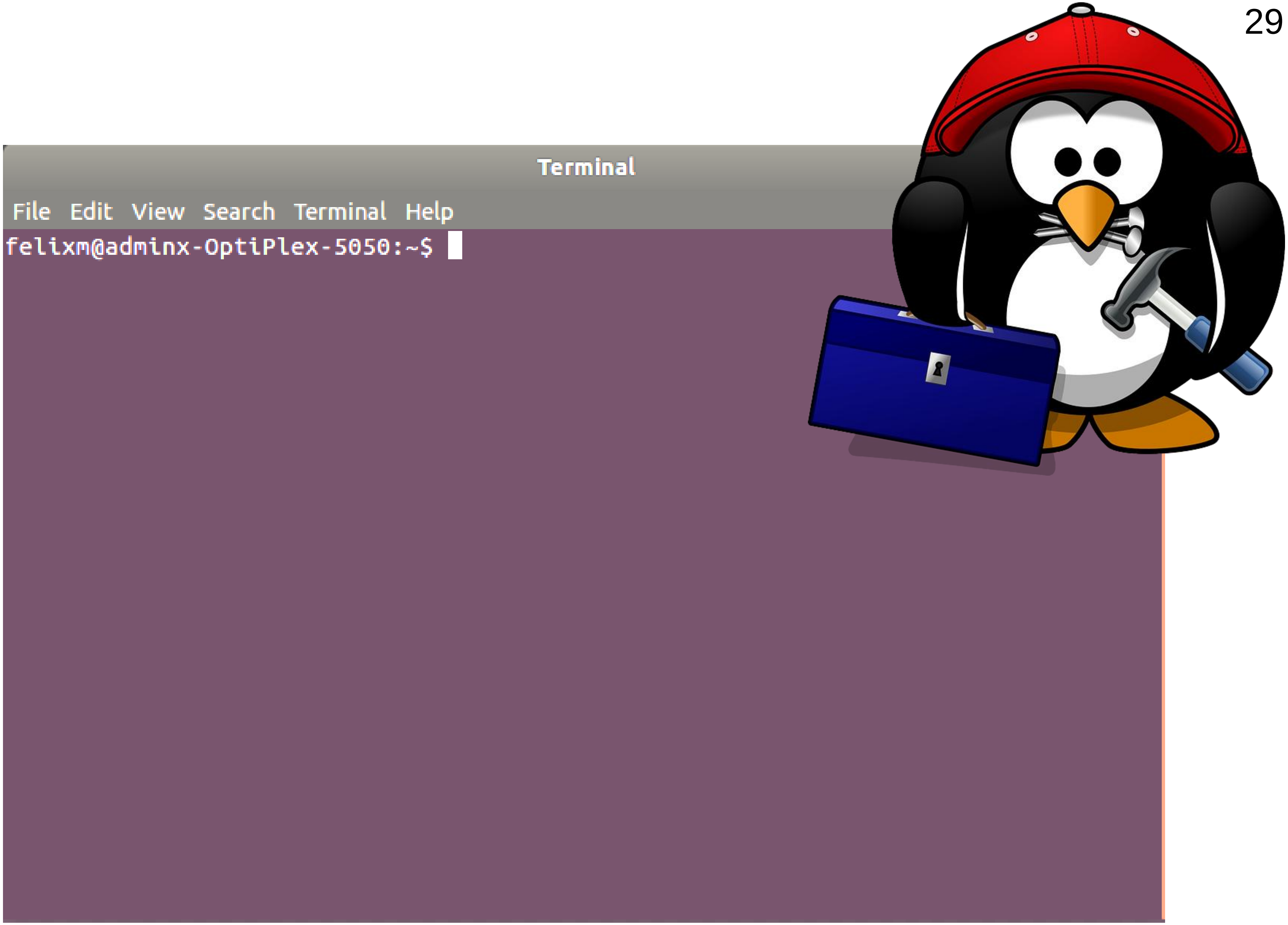
You are in the “Harz” folder.

How do you view the “Map.txt” file?

A: less Map.txt ✓

B: cd Map.txt

C: pwd



```
felixm@adminx-OptiPlex-5050:~$ 
```

OpenClipart-Vectors (Pixabay)

mo**v**e contents of document place/name

```
mv report ../Coworker/
mv report FelixReport
mv FelixReport ../Coworker/
```

co**p**y contents of document

```
cp report ../Coworker/
cp report ../Coworker/FelixReport
```

Bernd Klutsch (Unsplash)

put into archive (compress):

zip letter.zip report document

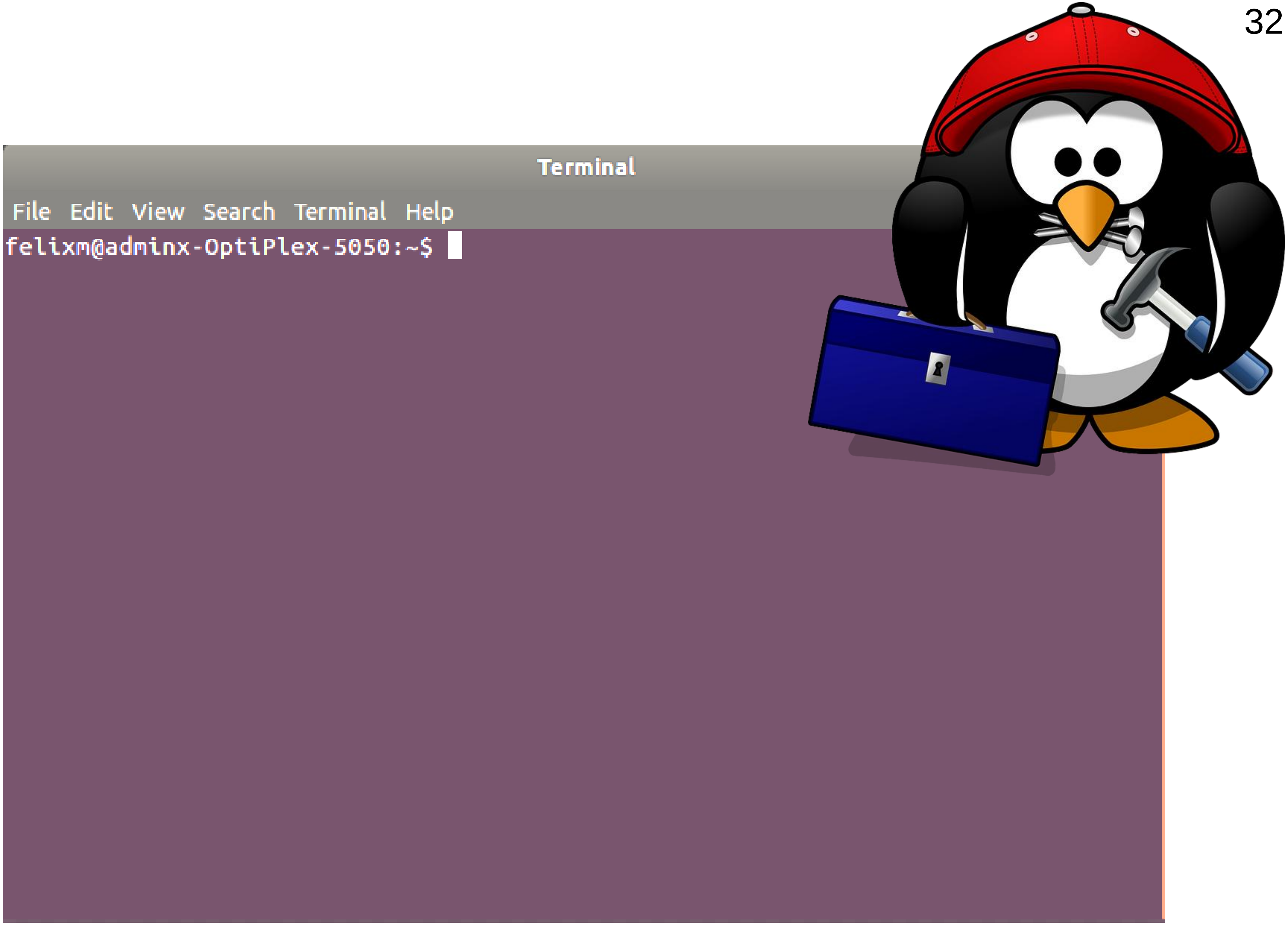
extract from archive (decompress):

unzip letter.zip

remove files

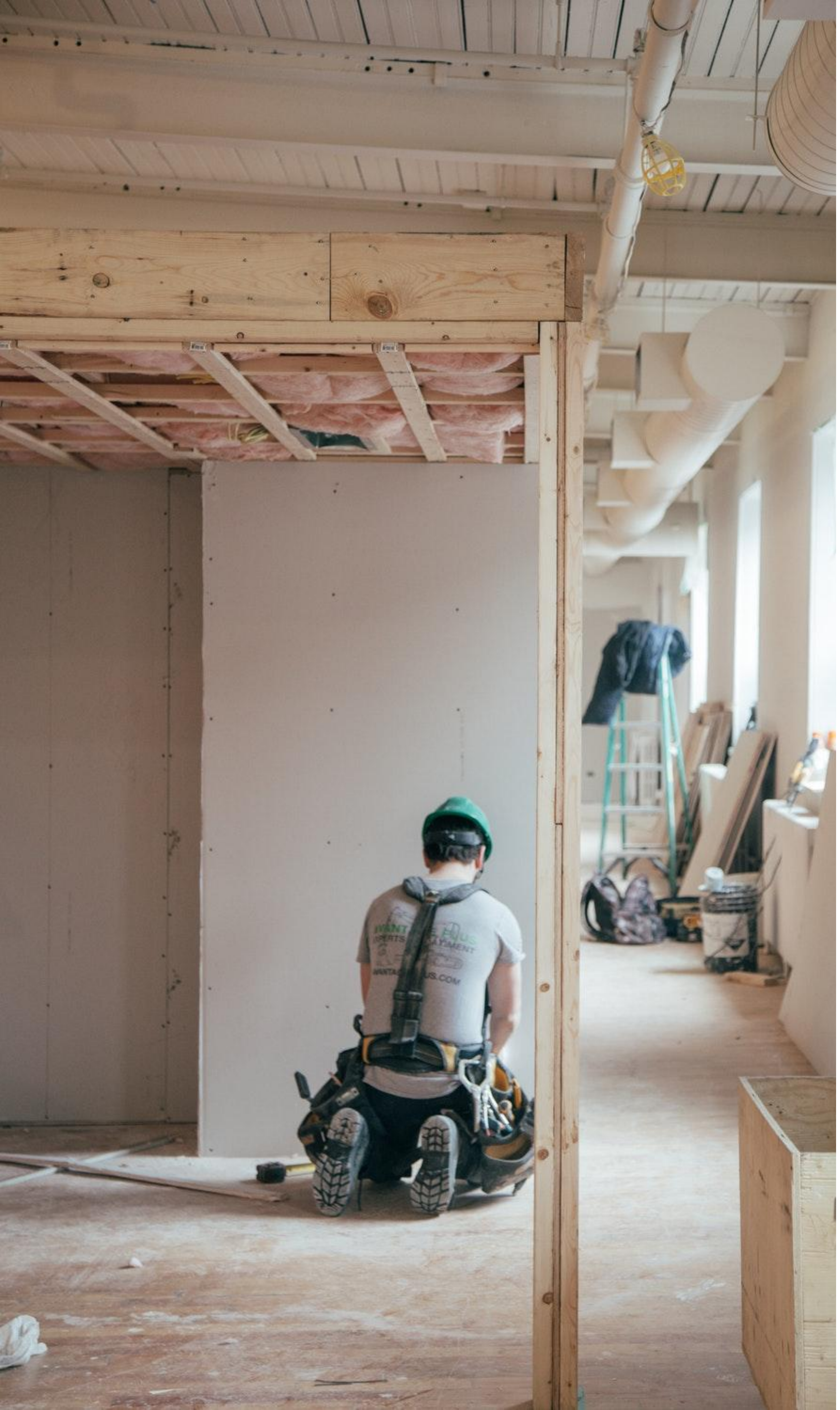
rm coverLetter_2

OpenClipart-Vectors (Pixabay)
Vitor Santos (Unsplash)



```
felixm@adminx-OptiPlex-5050:~$ 
```

OpenClipart-Vectors (Pixabay)



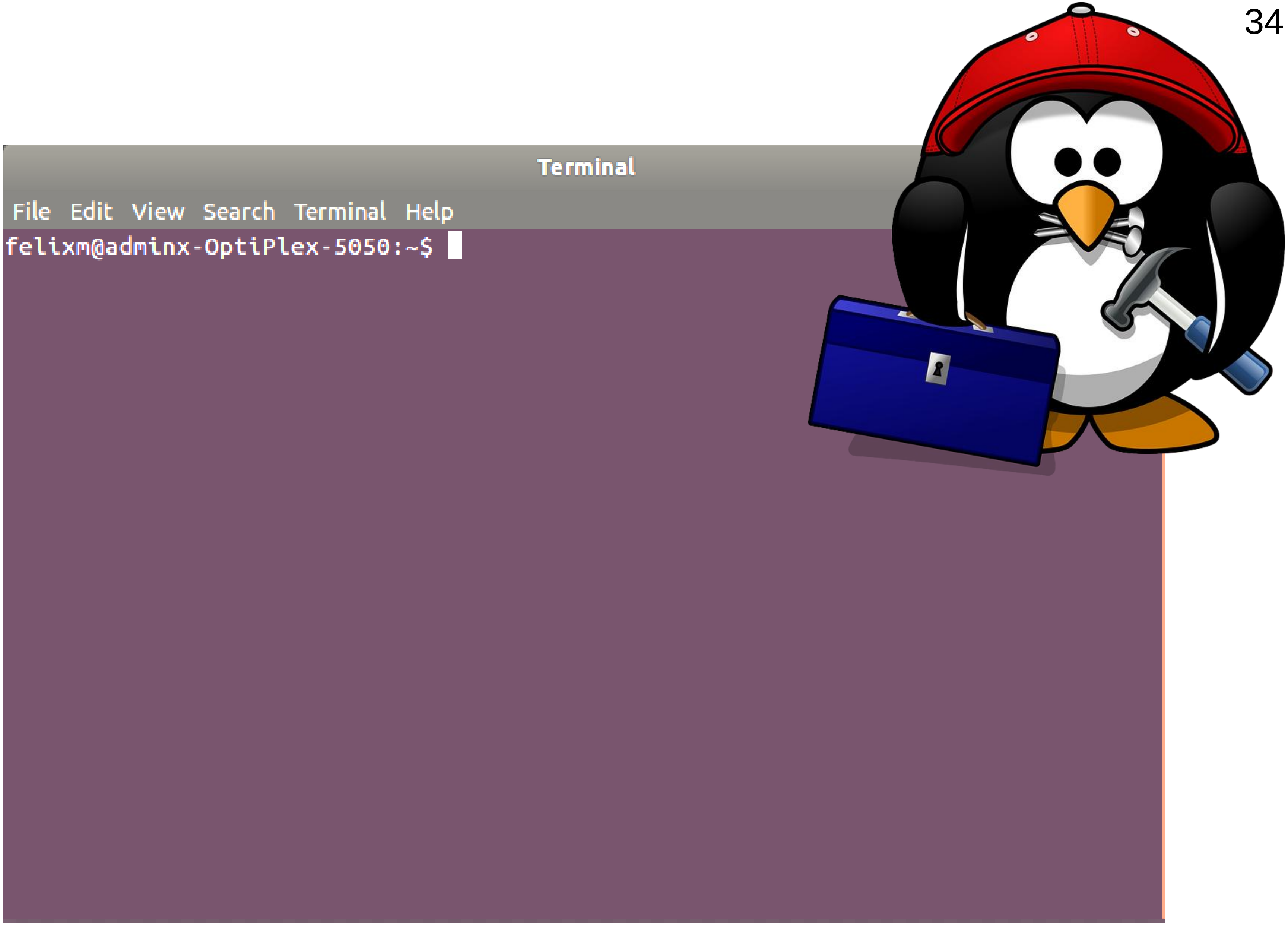
ma**k**e **dir**ectory

```
mkdir ../NEWoffice
```

re**m**ove directory **–r**

```
rm –r ../officePensioner
```

Charles (Unsplash)
OpenClipart-Vectors (Pixabay)



```
felixm@adminx-OptiPlex-5050:~$
```

OpenClipart-Vectors (Pixabay)

Hunters Race (Unsplash)

sort (file) contents

```
sort messy.txt
```

check for **diff**erences of files

```
diff final.txt final_final.txt
```

global search for a **r**egular **e**xpression and **p**rint out matched lines

```
grep “Secret” superSecret.txt
grep –E “^>” seq.fasta
```

Darwin Vegher (Unsplash)

From screen to file

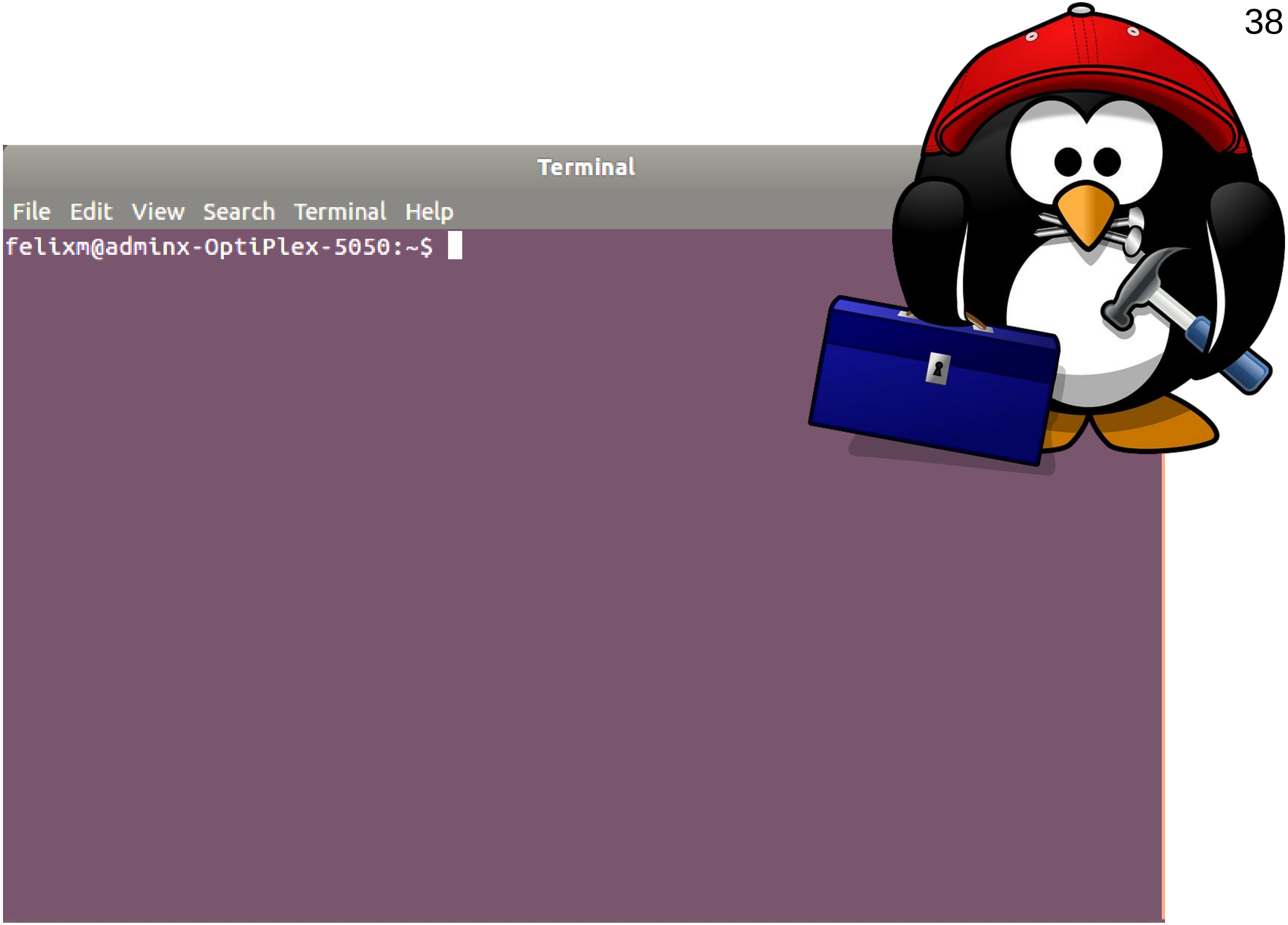
Save

```
output:    ./script.py > results.txt
errors:    ./script.py 2> errors.txt
both:      ./script.py > out.txt 2>&1
```

Append

```
./followUp.py >> results.txt
```

Modified from: Fredy Jacob (Pixabay)



```
felixm@adminx-OptiPlex-5050:~$
```

OpenClipart-Vectors (Pixabay)

https://upload.wikimedia.org/wikipedia/commons/2/29/Ford_assembly_line_-_1913.jpg; 12.08.2019

|: (anonymous) pipe

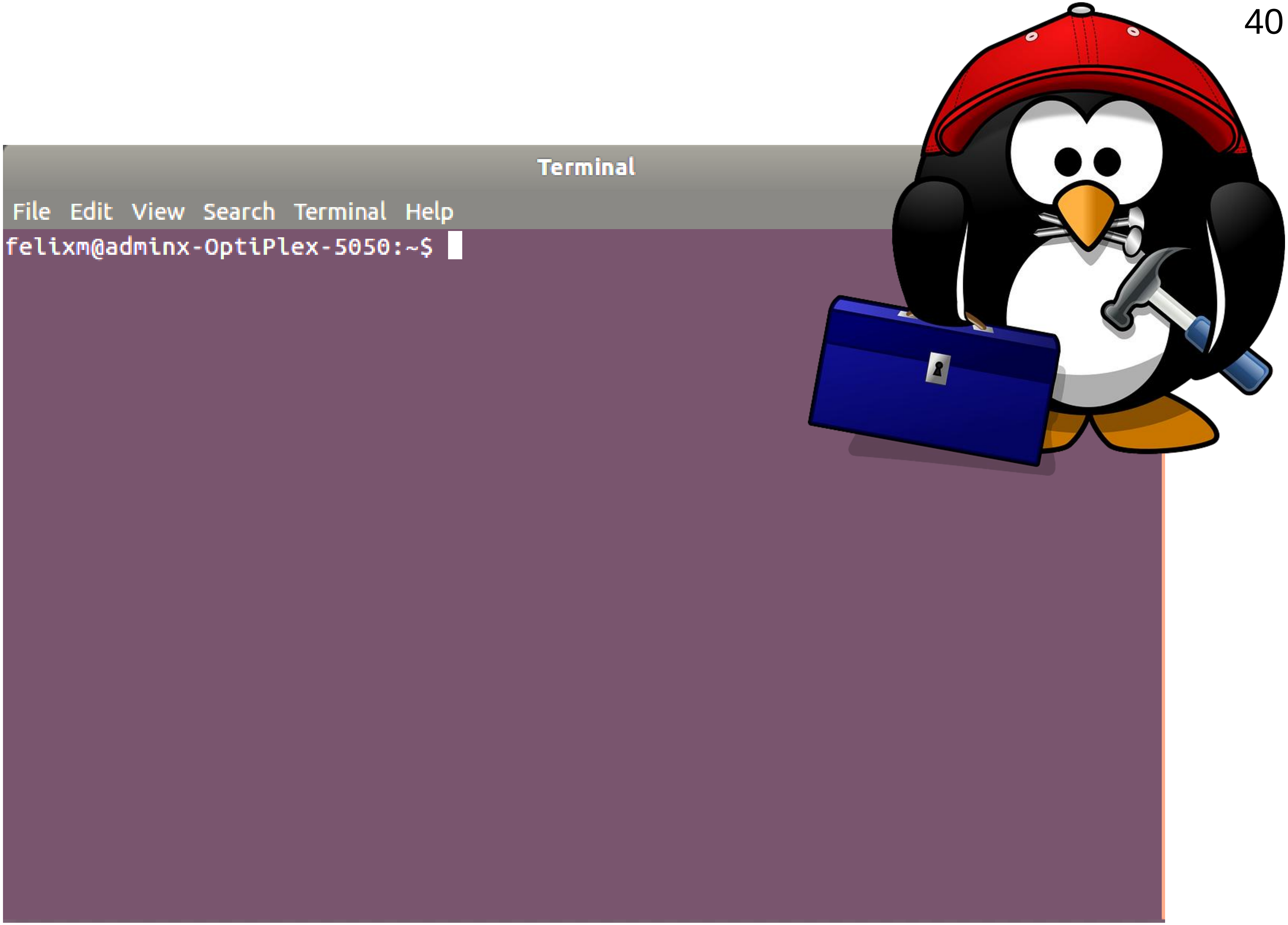
E.g.:

1) list all files in seq

2) consider only fasta files

3) sort by file size

```
ls -l seq/ | grep “.fasta” | sort –k5,5nr
```



```
felixm@adminx-OptiPlex-5050:~$ 
```

OpenClipart-Vectors (Pixabay)

E.g.:

ryanstutorials.net
/linuxtutorial
/navigation.php

computerhope.com
/unix.htm

DariuszSankowski (Pixabay)

THANK YOU!