

1) Use sed to replace all uppercase characters of the text with lowercase characters

```
axoy@AxoyUX5401: ~/hw2
axoy [16:18:40]:~/hw2$ pwd
/home/axoy/hw2
axoy [16:18:43]:~/hw2$ ls
names_sed.txt
axoy [16:18:46]:~/hw2$ ls practical2/
example.sh  journalctl-2021sep.log  names_sed.txt  testfile_sed.txt
axoy [16:18:48]:~/hw2$ head -n 5 practical2/testfile_sed.txt

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Dr. Naomi Elster - Dr. of Breast Cancer and WriterbyDr. Naomi Elster - Dr. of Breast Cancer and Writer  April 6, 2017 in Politic
s & Foreign Affairs, Society
axoy [16:19:31]:~/hw2$ sed 's/[A-Z]/\L&/g' practical2/testfile_sed.txt > tolowercase.txt
axoy [16:20:00]:~/hw2$ head -n 5 tolowercase.txt

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s & foreign affairs, society
axoy [16:20:05]:~/hw2$ |
```

2) Use sed to Replace the word 'danger' on 2nd occurrence of every line from whole file, use

```
axoy@AxoyUX5401: ~/hw2
axoy [16:23:01]:~/hw2$ ls practical2/
example.sh  journalctl-2021sep.log  names_sed.txt  testfile_sed.txt
axoy [16:23:04]:~/hw2$ cat practical2/testfile_sed.txt | grep 'danger'
Hate speech is usually considered in context of it being used against people on the basis of their ethnicity, nationality or religion, but it can in theory be used against any
group. Puzzlingly and alarmingly, hate speech in the context of gender is often not considered as such or given as much weight as it should be, particularly in light of context
s such as rape, where victims often face disbelief and even blame, either direct or implied ("What was she wearing?" "Was she drunk?"), and abortion stigma, where often already
vulnerable women are threatened and harassed, and can be victims of violence. As Katie Gillum of Inroads; an international campaign against abortion stigma, said to me in an i
nterview for another piece on the influence of the US on abortion rights worldwide, "In practice abortion stigma makes seeking or providing abortion a more complicated or dange
rous activity, and stigma makes talking about a personal experience more uncomfortable or dangerous."
Susan Benesch, Harvard associate professor and founder of Dangerous Speech Project, studies how, what she refers to as 'dangerous speech', can incite mass violence. A former wa
r journalist, she's traveled to faraway places more likely to be found on a Foreign and Commonwealth Office official 'essential travel only' list than a holiday brochure, but l
ast October, she expressed concerns about the situation closer to home.
According to the Dangerous Speech Project, which studies dangerous speech and how to prevent violence by counteracting it, 'Dangerous Speech' is 'uncannily similar' across diff
erent languages and cultures. The example they gave is of people often being referred to as insects, vermin, aliens, threats, or pollution. They contend that; "Inflammatory pub
lic speech rises steadily before outbreaks of mass violence, suggesting that it is a precursor or even a prerequisite for violence, which makes sense: groups of killers do not
form spontaneously." There is some historical support for this claim. Jews were called rats and vermin by Nazis before the Holocaust. Tutsi people were called cockroaches by th
e Hutu before the horrendous 1994 Rwanda genocide.
How, then, does speech become dangerous?
The Dangerous Speech Project believes that countering dangerous speech must not impinge on freedom of speech, and so careful efforts must be made to distinguish it from speech
that is merely distasteful. Professor Benesch has developed a framework for identifying when speech stops being merely offensive and becomes dangerous. For that escalation to h
appen, two of the following five factors must be true:
Trump, like many politicians, has been difficult to pin down, as many of the things he says are ambiguous. However, Benesch did have concerns that some of his more memorable ca
mpaign statements sit a little too comfortably within her framework. It doesn't take a massive stretch of the imagination to read his suggestion that 'the second Amendment peop
le' 'do something', about Hilary Clinton for example, as 'a call to violence.' "It seems to me, impossible that people didn't understand that as a reference to violence," Benes
ch said to the Washington Post in October. Trump's influence over his audience isn't in doubt. His claim in a debate that Obama and Clinton were founders of the Islamic State w
as, she said in the same interview, a "hallmark of dangerous speech to describe an in-group member as the enemy."
The issue is knowing which speech to curtail, and when someone should be denied a platform. Benesch's framework is potentially valuable, as it lays out when speech stops being
merely distasteful and becomes dangerous. It is also more subjective than, for example, a politician censoring his opponents. The Dangerous Speech Project website states that;
"Efforts [to curtail dangerous speech] must not infringe upon freedom of speech, however, since that is a fundamental right and since free speech itself may help to prevent vio
lence. Before acting to limit 'dangerous speech'-speech that catalyzes violence-we must have a means to distinguish it from other speech, even that which is controversial or re
pugnant."
axoy [16:23:35]:~/hw2$ sed 's/danger/fse2023/2' practical2/testfile_sed.txt > danger2.txt
axoy [16:23:53]:~/hw2$ cat danger2.txt | grep 'fse2023'
Hate speech is usually considered in context of it being used against people on the basis of their ethnicity, nationality or religion, but it can in theory be used against any
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epugnant."
axoy [16:24:07]:~/hw2$ |
```

3) Use sed to add a new line with some content after every pattern match

```
axoy@AxoyUX540t: ~/hw2
axoy [16:24:41]:~/hw2$ head -n 5 practical2/testfile_sed.txt
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axoy [16:24:59]:~/hw2$ sed '/Society/a in new line' practical2/testfile_sed.txt > sedaddline.txt
axoy [16:25:59]:~/hw2$ head -n 5 sedaddline.txt
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in new line
More than Hurt Feelings: The Real Danger of Hate Speech
axoy [16:26:05]:~/hw2$ head -n 8 sedaddline.txt
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in new line
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in new line
speech-protest-equality-freedom
axoy [16:26:10]:~/hw2$ |
```

4) Sed allows running multiple commands in one call. Chain the sed commands with multiple -e flags. Change each occurrence of “danger” to “safety” and “hate” to “love”.

```
axoy@AxoyUX540t: ~/hw2
axoy [16:39:26]:~/hw2$ head -n 15 practical2/testfile_sed.txt
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EDITOR'S NOTES: THIS PIECE IS AUTHORED BY Naomi Elster. Naomi has a PhD in Breast Cancer, and is an author of fiction, non-fiction and scripts. Her work has been widely publish
ed, including; The Establishment, The Guardian and Crannog Magazine.
Now that Trump is president, I'm going to shoot you and all the blacks that I can find.

These words were spoken to a twelve-year-old girl.

In the first week following the election of a candidate endorsed by the Ku Klux Klan, 437 racist, sexist or xenophobic incidents took place, most of them against groups Trump h
ad viciously denigrated during his campaign; people of color, women, LGBTQ people and immigrants. It's not unreasonable to suppose that the extreme rhetoric used in Trump's cam
paign may have incited at least some of those incidents. The night after the result was announced, I sat in a bar in Europe with an American friend who wondered aloud about goi
ng home for Christmas. "Is this result going to make all those extreme racists who've felt they had to be silent for years feel validated?" she asked. "To the point, they feel
comfortable putting their hoods back on?"

My friend wouldn't have been comforted by the words of Richard Cohen, president of the Southern Poverty Law center. Quoted in the New Yorker, he said; "White supremacists are c
elebrating, and it's their time, the way they see it," referring to a survey of teachers which reported that more than half of them had seen an increase in hostile speech durin
g the campaign, and that students of color have wondered aloud if their parents will be deported.

axoy [16:39:47]:~/hw2$ sed -e 's/danger/safety/g' -e 's/hate/love/g' practical2/testfile_sed.txt > dangerhate.txt
axoy [16:40:34]:~/hw2$ head -n 15 dangerhate.txt
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g the campaign, and that students of color have wondered aloud if their parents will be deported.
```

5) Use sed to replace all numeric sequences in the file to “%” symbol

```
axoy@AxoyUX5401: ~/hw2
axoy [16:47:22]:~/hw2$ ls practical2/
example.sh journalctl-2021sep.log names_sed.txt testfile_sed.txt
axoy [16:47:26]:~/hw2$ grep -Eo '[0-9]+' practical2/testfile_sed.txt | wc -w
38
axoy [16:48:10]:~/hw2$ sed 's/[0-9]\+/%/g' practical2/testfile_sed.txt > numtopercentage.txt
axoy [16:48:13]:~/hw2$ grep -Eo '[0-9]+' numtopercentage.txt | wc -w
0
axoy [16:48:20]:~/hw2$ grep -Eo '%' numtopercentage.txt | wc -w
38
axoy [16:48:29]:~/hw2$
```

6) Switching pairs of words. Let's suppose you have a file containing a tab separated table, full names in the format First name, Last name are in the second column. To adequately process the file, you may want to switch Last name and First name. Switch the name pairs and preserve other columns

```
axoy@AxoyUX5401: ~/hw2
axoy [18:11:08]:~/hw2$ head -n 5 practical2/names_sed.txt
Governor of Alabama      Kay Ivey      Republican      April 10, 2017
Governor of Alaska       Mike Dunleavy Republican      December 3, 2018
Governor of American Samoa Lemanu Palepoi Mauga Democratic      January 3, 2021
Governor of Arizona      Doug Ducey    Republican      January 5, 2015
Governor of Arkansas     Asa Hutchinson Republican      January 13, 2015
axoy [18:11:08]:~/hw2$ sed -E 's/(.*)\t(.*) (.*)\t(.*)\t(.*)/1\t3 \2\t4\t5/' practical2/names_sed.txt > namecolswap.txt
axoy [18:11:11]:~/hw2$ head -n 5 namecolswap.txt
Governor of Alabama      Ivey Kay      Republican      April 10, 2017
Governor of Alaska       Dunleavy Mike Republican      December 3, 2018
Governor of American Samoa Mauga Lemanu Palepoi Democratic      January 3, 2021
Governor of Arizona      Ducey Doug    Republican      January 5, 2015
Governor of Arkansas     Hutchinson Asa Republican      January 13, 2015
axoy [18:11:21]:~/hw2$
```

7) Use vim to write a Python script (with a shebang) that reads the platform.system(), print that “Checking in progress...” and if it's “Windows” then politely ask to switch to “Linux”. Define a function check_platform()

```
#!/usr/bin/python3

import platform

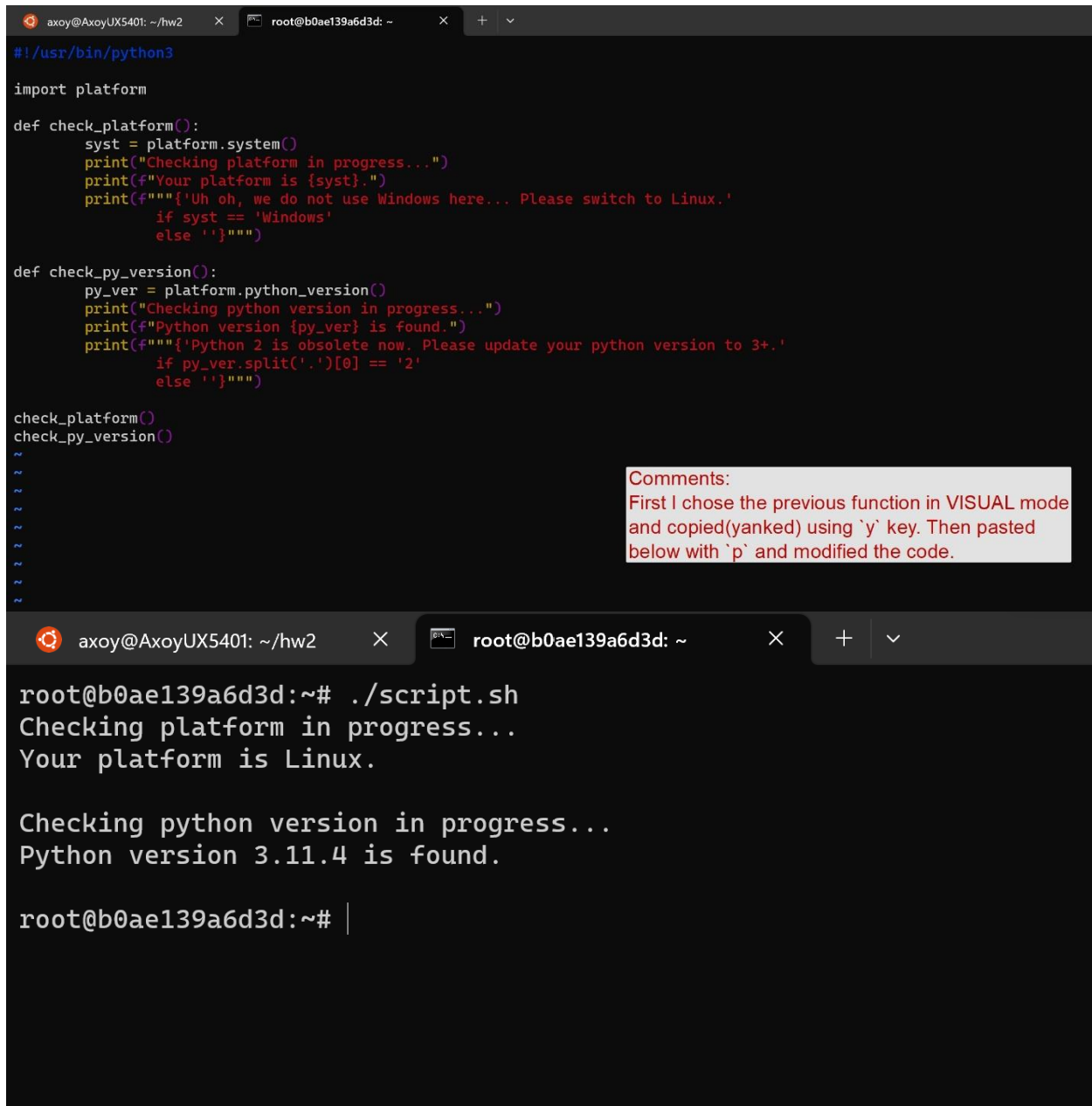
def check_platform():
    print("Checking in progress...")
    print(f'{"Uh oh, we do not use Windows here... Please switch to Linux." if platform.system() == "Windows" else ""}')

check_platform()
~
~
~

root@b0ae139a6d3d:~# ./script.sh
Checking in progress...

root@b0ae139a6d3d:~#
```

8) In vim, yank and paste the function and redefine it to check `platform.python_version()`, if it's version "2" politely ask to switch to "3"



The screenshot shows a terminal window with two tabs. The first tab, titled 'axoy@AxoyUX5401: ~/hw2', contains a vim script. The script defines two functions: `check_platform()` and `check_py_version()`. `check_platform()` uses `platform.system()` to check the OS and prints a message if it's Windows. `check_py_version()` uses `platform.python_version()` to check the Python version and prints a message if it's 2.x, suggesting an update to 3.x. The script then calls both functions. The second tab, titled 'root@b0ae139a6d3d: ~', shows the output of running `./script.sh`. It displays the messages from the script: 'Checking platform in progress...' followed by 'Your platform is Linux.', and 'Checking python version in progress...' followed by 'Python version 3.11.4 is found.'.

```
#!/usr/bin/python3

import platform

def check_platform():
    syst = platform.system()
    print("Checking platform in progress...")
    print(f"Your platform is {syst}.")
    print(f"{'Uh oh, we do not use Windows here... Please switch to Linux.' if syst == 'Windows' else ''}")

def check_py_version():
    py_ver = platform.python_version()
    print("Checking python version in progress...")
    print(f"Python version {py_ver} is found.")
    print(f"{'Python 2 is obsolete now. Please update your python version to 3+.' if py_ver.split('.')[0] == '2' else ''}")

check_platform()
check_py_version()
~
~
~
~
~
~
~
~
```

Comments:
First I chose the previous function in VISUAL mode and copied(yanked) using `y` key. Then pasted below with `p` and modified the code.

```
root@b0ae139a6d3d:~# ./script.sh
Checking platform in progress...
Your platform is Linux.

Checking python version in progress...
Python version 3.11.4 is found.

root@b0ae139a6d3d:~# |
```

9) Use vim to write a Python script “process.py” that 1) reads data from standard input, splits it into an integer, string, and floating-point comma-separated fields (variables “id”, “name”, and “age”), 2) sets “id” to be “id + 2” for positive “id”, replaces any spaces encountered in “name” by underscores and lowercases the “name”, and multiplies “value” by a factor of 0.5, and 3) prints the results into the standard output. Example input data: 1, Yuri Gagarin, 32.5 2, Albert Einstein, 88.3 3, notausser, notanumber, notanumber -1, root, 0.0 Example output data: 3, yuri_gagarin, 16.25 4, albert_einstein, 44.15 Do: make the script executable from the command line by changing file permissions and adding a shebang. Do: capture any exceptions encountered on the input (e.g., “id” not being a positive integer, empty lines, etc.), and print meaningful output to standard error.

```
#!/usr/bin/python3
import sys

def main():
    data = sys.stdin.readlines()

    for i in range(len(data)):
        tmp = data[i].replace("\n", "").split(',')

        try:
            data[i] = ', '.join([
                str(int(tmp[0]) + 2 if int(tmp[0]) > 0 else int(tmp[0])),
                tmp[1].replace(" ", "_").lower(),
                str(float(tmp[2]) * 0.5)
            ])
        except Exception as e:
            print(f"\033[91mThere's an error on line {i+1}.\nError: {e}.\nCheck if you entered correct data for 'id,name,age'.\033[00m")

    print(f"\033[92m{data[i]}\033[00m")

main()
```

```
root@b0ae139a6d3d:~# ls -l
total 8
-rwxr-xr-x 1 root root 643 Oct 12 13:51 process.py
-rwxr-xr-x 1 root root 602 Oct 12 07:56 script.sh
root@b0ae139a6d3d:~# ./process.py
1, Yuri Gagarin, 32.5
2, Albert Einstein, 88.3
3, notausser, notanumber
-1, root, 0.0
3, yuri_gagarin, 16.25
4, albert_einstein, 44.15
There's an error on line 3.
Error: could not convert string to float: 'notanumber'.
Check if you entered correct data for 'id,name,age'.
-1, root, 0.0
root@b0ae139a6d3d:~#
```

10) In vim, comment out the initial function using a shortcut and save the file.

```
#!/usr/bin/python3
import platform

#def check_platform():
#    syst = platform.system()
#    print("Checking platform in progress...")
#    print(f"Your platform is {syst}.")
#    print(f"{'Uh oh, we do not use Windows here... Please switch to Linux.'
#          if syst == 'Windows'
#          else ''}")

def check_py_version():
    py_ver = platform.python_version()
    print("Checking python version in progress...")
    print(f"Python version {py_ver} is found.")
    print(f"{'Python 2 is obsolete now. Please update your python version to 3+.'
          if py_ver.split('.')[0] == '2'
          else ''}")

check_platform()
check_py_version()
~
~
~
```

```
Steps:
1) Put the marker to the beginning of the function
2) Put the editor in the VISUAL BLOCK mode and select the necessary lines
3) Shift + I to get in the INSERT mode and type #.
4) Press ESC and Voila!
```

11) Search for a “check” using a command inside the script and replace it to “inspect”

```
axoy@AxoyUXS401: ~/hw2 X root@b0ae139e6d3d: ~ X + v
#!/usr/bin/python3

import platform

#def check_platform():
#    syst = platform.system()
#    print("Checking platform in progress...")
#    print(f"Your platform is {syst}.")
#    print(f"""Uh oh, we do not use Windows here... Please switch to Linux.'
#           if syst == 'Windows'
#           else ''""")
#
def check_py_version():
    py_ver = platform.python_version()
    print("Checking python version in progress...")
    print(f"Python version {py_ver} is found.")
    print(f"""Python 2 is obsolete now. Please update your python version to 3+.'
           if py_ver.split('.')[0] == '2'
           else ''""")

check_platform()
check_py_version()

:s/check/inspect/g
```

```
axoy@AxoyUXS401: ~/hw2 X root@b0ae139e6d3d: ~ X + v
#!/usr/bin/python3

import platform

#def inspect_platform():
#    syst = platform.system()
#    print("Checking platform in progress...")
#    print(f"Your platform is {syst}.")
#    print(f"""Uh oh, we do not use Windows here... Please switch to Linux.'
#           if syst == 'Windows'
#           else ''""")
#
def inspect_py_version():
    py_ver = platform.python_version()
    print("Checking python version in progress...")
    print(f"Python version {py_ver} is found.")
    print(f"""Python 2 is obsolete now. Please update your python version to 3+.'
           if py_ver.split('.')[0] == '2'
           else ''""")

inspect_platform()
inspect_py_version()
```

12) Recap tasks for find. In the current directory create two files with permissions `rwrxwrx-x` and `r--r--r--`. Then using `find` search for `rwrxwrx-x` file

```
axoy@AxoyUX5401: ~/hw2 X root@b0ae139a6d3d: ~ + v
root@b0ae139a6d3d:~# ls -l
total 8
-rwxr-xr-x 1 root root 643 Oct 12 13:51 process.py
-rwxr-xr-x 1 root root 602 Oct 12 14:00 script.sh
root@b0ae139a6d3d:~# chmod 775 process.py
root@b0ae139a6d3d:~# chmod 444 script.sh
root@b0ae139a6d3d:~# ls -l
total 8
-rwxrwxr-x 1 root root 643 Oct 12 13:51 process.py
-r--r--r-- 1 root root 602 Oct 12 14:00 script.sh
root@b0ae139a6d3d:~# find . -type f -perm 775
./process.py
root@b0ae139a6d3d:~# |
```

13) Recap tasks for find. Create multiple files in both directories “foo” and “bar” which are named 0.txt...9.txt. Then find all odd files in both directories and remove them

```
axoy@AxoyUX5401: ~/hw2 X root@b0ae139a6d3d: ~ + v
root@b0ae139a6d3d:~# mkdir foo; for i in {0..9}; do touch "foo/$i.txt"; done
root@b0ae139a6d3d:~# mkdir bar; for i in {0..9}; do touch "bar/$i.txt"; done
root@b0ae139a6d3d:~# tree
.
|-- bar
|   |-- 0.txt
|   |-- 1.txt
|   |-- 2.txt
|   |-- 3.txt
|   |-- 4.txt
|   |-- 5.txt
|   |-- 6.txt
|   |-- 7.txt
|   |-- 8.txt
|   `-- 9.txt
|-- foo
|   |-- 0.txt
|   |-- 1.txt
|   |-- 2.txt
|   |-- 3.txt
|   |-- 4.txt
|   |-- 5.txt
|   |-- 6.txt
|   |-- 7.txt
|   |-- 8.txt
|   `-- 9.txt
|-- process.py
`-- script.sh

3 directories, 22 files
root@b0ae139a6d3d:~# find foo bar -type f -name "[13579].txt" -delete
root@b0ae139a6d3d:~# tree
.
|-- bar
|   |-- 0.txt
|   |-- 2.txt
|   |-- 4.txt
|   |-- 6.txt
|   `-- 8.txt
|-- foo
|   |-- 0.txt
|   |-- 2.txt
|   |-- 4.txt
|   |-- 6.txt
|   `-- 8.txt
|-- process.py
`-- script.sh

3 directories, 12 files
root@b0ae139a6d3d:~# |
```

14) Recap tasks for find. Find all the files which are accessed in the last 1 hour

```
axoy@AxoyUX5401: ~/hw2  ×  root@b0ae139a6d3d: ~  ×  +  ▾  
root@b0ae139a6d3d:~# find -type f -amin -60  
./foo/2.txt  
./foo/6.txt  
./foo/4.txt  
./foo/0.txt  
./foo/8.txt  
./bar/2.txt  
./bar/6.txt  
./bar/4.txt  
./bar/0.txt  
./bar/8.txt  
./script.sh  
./viminfo  
root@b0ae139a6d3d:~# |
```


15) Recap tasks for find. Create three files of different sizes with at least one of size between 50 and 100MB. Find all the files which are greater than 50MB and less than 100MB

```
axoy@AxoyUX5401: ~/hw2 X root@b0ae139a6d3d: ~ X + v
root@b0ae139a6d3d:~# dd if=/dev/zero of=small_file bs=1M count=10
10+0 records in
10+0 records out
10485760 bytes (10 MB, 10 MiB) copied, 0.00499795 s, 2.1 GB/s
root@b0ae139a6d3d:~# dd if=/dev/zero of=medium_file bs=1M count=70
70+0 records in
70+0 records out
73400320 bytes (73 MB, 70 MiB) copied, 0.0582922 s, 1.3 GB/s
root@b0ae139a6d3d:~# dd if=/dev/zero of=large_file bs=1M count=120
120+0 records in
120+0 records out
125829120 bytes (126 MB, 120 MiB) copied, 0.0648208 s, 1.9 GB/s
root@b0ae139a6d3d:~# ls
bar foo large_file medium_file process.py script.sh small_file
root@b0ae139a6d3d:~# ls -la
total 204844
drwx----- 1 root root      4096 Oct 12 14:58 .
drwxr-xr-x 1 root root      4096 Oct  5 06:33 ..
-rw-r--r-- 1 root root      3106 Oct 17  2022 .bashrc
-rw-r--r-- 1 root root       161 Oct 17  2022 .profile
-rw----- 1 root root         0 Oct 12 06:56 .python_history
-rw----- 1 root root     10642 Oct 12 14:39 .viminfo
drwxr-xr-x 2 root root      4096 Oct 12 14:45 bar
drwxr-xr-x 2 root root      4096 Oct 12 14:45 foo
-rw-r--r-- 1 root root 125829120 Oct 12 14:58 large_file
-rw-r--r-- 1 root root  73400320 Oct 12 14:58 medium_file
-rwxrwxr-x 1 root root       643 Oct 12 13:51 process.py
-r--r--r-- 1 root root       602 Oct 12 14:00 script.sh
-rw-r--r-- 1 root root 10485760 Oct 12 14:58 small_file
root@b0ae139a6d3d:~# ls -lash
total 201M
4.0K drwx----- 1 root root 4.0K Oct 12 14:58 .
4.0K drwxr-xr-x 1 root root 4.0K Oct  5 06:33 ..
4.0K -rw-r--r-- 1 root root 3.1K Oct 17  2022 .bashrc
4.0K -rw-r--r-- 1 root root 161 Oct 17  2022 .profile
0 -rw----- 1 root root  0 Oct 12 06:56 .python_history
12K -rw----- 1 root root 11K Oct 12 14:39 .viminfo
4.0K drwxr-xr-x 2 root root 4.0K Oct 12 14:45 bar
4.0K drwxr-xr-x 2 root root 4.0K Oct 12 14:45 foo
120M -rw-r--r-- 1 root root 120M Oct 12 14:58 large_file
70M -rw-r--r-- 1 root root 70M Oct 12 14:58 medium_file
4.0K -rwxrwxr-x 1 root root 643 Oct 12 13:51 process.py
4.0K -r--r--r-- 1 root root 602 Oct 12 14:00 script.sh
10M -rw-r--r-- 1 root root 10M Oct 12 14:58 small_file
root@b0ae139a6d3d:~# find -type f -size +50M -size -100M
./medium_file
root@b0ae139a6d3d:~# |
```

16) Recap tasks for find. Search for all PY files in a directory and output lines with import

```
axoy@AxoyUX5401: ~/hw2 X root@b0ae139a6d3d: ~ X + v
root@b0ae139a6d3d:~# find -type f -name "*.py" | xargs grep "import"
import sys
root@b0ae139a6d3d:~# |
```

17) Create a local variable nr_files and assign the number of lines found in the /etc/passwd file. Hint: Look into the command wc and command substitution and don't forget about quotation marks

```
axoy@AxoyUX5401: ~/hw2 X root@b0ae139a6d3d: ~ X + v
root@b0ae139a6d3d:~# nr_files=$(wc -l < /etc/passwd)
root@b0ae139a6d3d:~# echo "nr_files: $nr_files"
nr_files: 19
root@b0ae139a6d3d:~# |
```