# Prüfungsaufgabe S2020.1

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Galileo Galilei
Isaac Newton
William Thomson
James Clerk Maxwell
Ludwig Boltzmann
Max Planck
Marie Curie
Albert Einstein
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- Die Datei befindet sich im Verzeichnis "/home/phys/people", welches zugleich das aktuelle Ar- beitsverzeichnis darstellt und keine weiteren Dateien oder Verzeichnisse enth¨alt. Das Home- Verzeichnis ist "/home/phys" und enth¨alt nur "/home/phys/people". Erkl¨aren Sie die Wirkungen der folgenden UNIX Befehle, welche der Reihe nach ausgefu¨hrt werden (es wird vorausgesetzt, dass Sie s¨amtliche Berechtigungen besitzen). Wenn ein Befehl etwas auf den Bildschirm oder in eine Datei schreibt, mu¨ssen Sie exakt angeben, was geschrieben wird.

1. cat physicists.dat | head -1 > ~/list.dat
2. cat physicists.dat | grep M | sort | tail -1 >> ~/list.dat
3. chmod 751 physicists.da
4. cp ../list.dat ./list.txt
5. pwd > log
6. ls *.*t
7. rm *

# Rescue Boat

- [https://ethz.ch/content/dam/ethz/special-interest/chab/physical-chemistry/csms-dam/doc/InfoI_exe-res/infoI_rescueboat_HS16.pdf](https://ethz.ch/content/dam/ethz/special-interest/chab/physical-chemistry/csms-dam/doc/InfoI_exe-res/infoI_rescueboat_HS16.pdf)
- Falls ihr euch nicht fit in c++ fühlt, dann ist jetzt der richtige Zeitpunkt, die Theorie etwas aufzufrischen.
- Das Rescue Boat ist dazu da, euch zu helfen die Theorie bis exercise 3 zu verstehen. Es ist **nicht** verpflichtend.

# Lösung

1. The cat command writes the content of the file physicists.dat to the standard output. The pipe "|" redirects this standard output to the standard input of the following command, which in this case is head -1. Consequently, the command cat physicists.txt | head -1 (equiv- alent to head -1 physicists.dat) outputs the first line of the file physicists.dat. However, nothing is printed to the screen, as the ">" redirects this output to the file ~/list.dat, which corresponds to the absolute path /home/phys/list.dat. After the command is executed, this file consists of a single line, which is "Galileo Galilei".

2. The grep command selects the lines from the file physicists.dat which contain the charac- ter 'M'. These are "James Clark Maxwell", "Max Planck" and "Marie Curie". Because the search is case-sensitive, lines containing only a lower-case 'm' are not selected. Next, these lines are sorted alphabetically, and the last of them is appended with ">>" to the file ~/list.dat, which contains "Galileo Galilei" from task a. After the command is executed, this file contains two lines: "Galileo Galilei" and "Max Planck".

3. The permissions of the file physicists.dat are changed to 751. The three digits represent the permissions of the owner (first digit), of the group (second digit) and of others (third digit). The digits are encoded in octal format: 4 → read, 2 → write and 1 → execute. The command chmod 751 therefore changes the file permissions to readable (4), writable (2) and

executable (1) for the owner (i.e. 4 + 2 + 1 = 7), readable (4) and executable (1) for members of the group (i.e. 4 + 1 = 5), and only executable (1) for everyone else.

4. A copy of the file /home/phys/list.dat is made in the directory /home/phys/people, which is named /home/phys/people/list.txt. Remember that the current directory is /home/phys/people, that the "." stands for the parent directory (which is /home/phys), and the "." for the current directory. Note that ./list.txt could be replaced simply by list.txt in this command.

5. The command pwd outputs the absolute path of the current directory (i.e. the text line "/home/phys/people"), which is redirected with ">" to a newly created file /home/phys/people/log.

6. All the plain files in the current directory with names containing a '.' and ending with a 't' are listed on the screen (remember that the wildcard '*' matches any string of characters, possibly also an empty string). The output reads

   list.txt physicists.dat

The file log is not listed as it does not match the pattern "$*.*t$". The file ~/list.dat is not listed because it is not located in the current directory.

7. All plain files (not directories) inside the current directory are removed. The removed files are list.txt, physicists.dat and log.