Problem sheet:
Unix Fundamentals: Remote Machine

Part 1. SSH Connect (2 tasks)

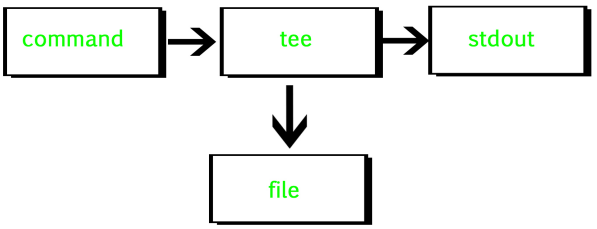
If there's no remote, try to use https://labs.play-with-docker.com/

1. ssh-keygen
    a. Generate a **ed25519** key with 1024 bits and store it to files with **new_key_ed25519** prefix
    b. Change the passphrase of this key
2. ssh-copy-id
    a. Do a dry-run of writing the new ssh key to a remote
    b. Run copy id on the remote

Part 2 (2 tasks)

3. Use the nohup program to run a long computation (for example use "sleep 100; echo complete").
    a. Enter the remote CLI and set up a program to write logs to a file
    b. Disconnect from the remote server immediately without waiting for the computation to complete, but not interrupting its work and saving the output and error logs.

4. Working with `stdout` and `stderr`
    a. Redirect standard output stream to standard error, and echo to standard error stream. You can choose any program to generate messages, for example `ls -lh`
    b. Now, the more complex task. Write a command that:
        i. displays the output and error streams as is and
        ii. redirect them into separate respective files (that means it prints error message to the *stderr* and to a file, and prints other outputs to *stdout* and to a file)
    c. Use the *tee* program (it reads from the standard input and writes to both standard output and one or more files at the same time)



    d. Use Process Substitution (https://tldp.org/LDP/abs/html/process-sub.html)
    (it creates a FIFO and lets tee listen on it. Then, it uses `>` (file redirection) to redirect the `stdout` of command to the FIFO that your first tee is listening on)

Part 3. Copying and Downloading Data (3 tasks)

5. Copy all files from some local *`/directory_local`* to the remote `/directory_remote` only if their size is between 10MB and 20MB. And show the progress
6. Copy all files from some local *`/directory_local`* to the remote `/directory_remote` only if their names don't start with *"a"* and don't end with *"z"*. And show the progress
7. Copy the directory structure without copying files from a local *`/directory_local`* to the remote `/directory_remote`. Hint: use -f flag and regular expression pattern

Part 4.

Use SSH to resolve the following problems on the remote and retrieve results locally:

8. From the files in logs.tar.xz output the top 3 most frequent IP addresses that performed the GET method from 10 to 17 hours 2015-01-13.
The answer for this task will be the top 3 most frequent IP addresses and their frequencies. And commands that you've used to obtain it

9. In the same archive find a list of all files with the .tsv extension that are larger than 5 MB and start archiving in the background.

The answer for this task will be the number of items (.tsv files) an archive contains. And commands that you've used to obtain it

10. The data_for_science.tar.xz directory contains files of the following format: target class, tab, comma-separated list of keywords. Your task is to find unique words for the *bad* class, which are contained in the three largest files. Remember, *DOG* and *dog* are the same word.

The answer for this task will be 10,11 and 12 entries in a sorted set of unique words. And commands that you've used to obtain it