Informatics for Astronomers - WS2021

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Exercise sheet 4 - Internet

The following will be also part of the assessment:

(1) Try to present exercises in a way that everyone can understand (even those who didn't do the exercises), so please explain the vital parts of your solution in a clear way.

(2) Try to also include some background information where applicable, and/or explain the possible context/motivation for the given exercise.

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1. In moodle you can find a `python` script called `portscanner.py` which scans the ports of a host to find out if any of them are open. Execute it, providing `localhost` as a input. How many ports are open?

   - Now open a session of `jupyter notebook` and execute the script again. Do you see a difference?
   - In a separate terminal execute: `python -m http.server` and execute the script again.

   What is happening?

2. Use the command `traceroute` to a website of your preference. Describe the output of that command. Use the IP address listed in the output to find out the "physical" route that the packages followed using a geolocation service (e.g. ipinfo.io).

3. Use `ssh` to connect a server to `login.univie.ac.at` or any other server

   - Use `scp/sftp` to download/upload files
   - What `ssh/scp/sftp` stands for? Why?

4. Look in `PyPi` for a `python` package that can perform (text) encryption. Install it in your system and encrypt (and decrypt) the text generated by `import this`

   - After seeing the results, what is encryption useful for?
   - Using the function to calculate the entropy from the previous exercise, evaluate the *entropy* before and *after* the encryption

5.