Informatics for Astronomers - WS2021

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Exercise sheet 1 - Basics

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. Take the string *abracadabra*. Calculate its entropy.
2. Look up the different classifications for state-machines. How do they differ?
3. What is the difference between a finite state machine and a Turing machine? What is the historic importance of the Turing machine?
4. Explain binary and hexadecimal representation of bytes and the differences of each system. Show the binary/hexadecimal correspondence for the following characters/numbers: *3, C, c, E, 7, y, =*
5. Explain the difference between an interpreted and a compiled programming language. Name a few of each category.
6. What does the `python` "Global Interpreter Lock" do and why is it needed. What are its drawbacks.