**Third homework assignment** announced 2. 4. 2023, due 21. 4. 2023 (prior to the lecture as a zip file in Brute)

In the fourth lecture, we have seen that a simulator of a Turing machine can be written in a couple of lines of Python. In the second homework assignment, you have hopefully produced your own simulator of a Turing machine. In the sixth lecture, you have seen the algorithms of Deutsch and Simon. In this homework assignment, you can get 10 points for all of:

- implementing Deutsch's algorithm in your simulator,
- implementing Simon's algorithm in your simulator,
- running the simulator on both algorithms for $n = 1$
- presenting the evolution of the state (as per the choices you made as to the model of computation you chose) in some intelligible fashion.

Only if you skipped the second homework assignment, you are allowed to use a standard simulator (such as `https://github.com/Qiskit/qiskit-aer/tree/main/src/simulators/statevector`).

You can also get up to 10 additional points, if you produce production-ready illustrations for the connection between the infraction pattern of the double-slit experiment and amplitude amplification (e.g. in Deutsch) and release them under permissive license (e.g., Creative Commons Attribution 4.0 International – CC BY 4.0). The points will be given for the depth of understanding into the connection, as well as the usability of the illustrations in some future version of the lecture notes. These points are optional, in that you can collect 100 points without collecting these 10.