

Fourth homework assignment announced 21. 4. 2023, due 5. 5. 2023
(prior to the lecture as a zip file in Brute)

In the seventh week, we have learned about quantum Fourier transform. There are many beautiful illustrations of the workings of Fourier transforms (<https://www.youtube.com/watch?v=jsuvaibdKg4> developed using <https://github.com/MathAnimation1198/ManimTutorial>, for example, and its 28-minute long cousin <https://www.youtube.com/watch?v=h7ap07q16V0>), but very few for the discrete Fourier transform of quantum Fourier transform. (The longer cousin has some material starting at minute 16, cca.) In this homework assignment, you can get 10 points for all of:

- watching the two tutorials linked above
- an animated introduction to the quantum Fourier transform for some low N .

The demonstration needs to be correct, but the “artistic impression” is more of a bonus level.

You can also get up to 10 additional points, if you produce a YouTube video based on the animation and “artistic impression”. We very much recommend <https://www.manim.community/>. 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. Please ping Jakub, Johannes, or Georgios before you release the video publicly, to check for correctness. These points are optional, in that you can collect 100 points without collecting these 10.