CS 276: Homework 1

Due Date: Fri. Sept. 6th, 2024 at 8:59pm via Gradescope

One-Way Functions

Let $f : \{0,1\}^* \to \{0,1\}^*$ be a one-way function, and let g be defined as follows:

$$g(x) = \begin{cases} f(x), & |x| \text{ is even} \\ x, & |x| \text{ is odd} \end{cases}$$

In our notation, $|x|$ is the bitlength of x. Note that g is not one-way because when $|x|$ is odd, g is easy to invert.

Question: Using g as a black box, construct a one-way function h and prove that h is one-way. This means that h can make calls to g, but it cannot call f directly.