

HOMEWORK 4 — DUE FEBRUARY 24 IN CLASS

1. Define the Kolmogorov complexity of a pair of strings $x, y \in \{0, 1\}^*$ as follows: $K(x, y)$ is equal to the least possible value of $|\langle M, w \rangle|$, where M is a Turing Machine, $w \in \{0, 1\}^*$, and $M(w)$ halts with its tape contents equal to the string $x\#y \in \{0, 1, \#\}^*$.

Prove or disprove: There is a fixed constant c such that $K(x, y) \leq K(x) + K(y) + c$ for all $x, y \in \{0, 1\}^*$.