Homework 9

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2014.12.23

Problem 1

We suppose that the function **copy** would insert the zeroes at the right end of the string like this:

$$copy(q_a, q_b) : q_a 10^m 1w \vdash^* q_b 10^m 1w0^m (w \in \{0,1\}^*)$$

And we try to construct the Turing Machine, here is the list below.

$$\delta(q_0, 1) = \{(q_1, 1, R)\}$$

$$\delta(q_1, 0) = \{(q_2, 2, R)\}$$

$$\delta(q_2, 0) = \{(q_2, 0, R)\}$$

$$\delta(q_2, 1) = \{copy(q_2, q_3)\}$$

$$\delta(q_3, 1) = \{(q_4, 1, L)\}$$

$$\delta(q_4, 0) = \{(q_4, 0, L)\}$$

$$\delta(q_4, 2) = \{(q_1, 0, R)\}$$

$$\delta(q_3, 2) = \{(q_f, 0, R)\}$$

So, we just do it.