

**Start Time:**

**Your name:**

**Stop Time:**

**Integrity signature:**

Suggested time limit 15 minutes, not counting download and upload. Please add explanation if over 20 minutes.

1. Explicitly describe a Turing machine that computes the function  $n \mapsto n + 1$ , with  $n \in \Sigma^*$  and  $n \in \Sigma^*$  the binary representations of non-negative integers (possibly with extra leading zeros). Describe the Turing machine with a state diagram (preferred) or a transition function. (You can get partial credit by describing the overall idea of how it works.)