CS 1511 Homework 5

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11 a.

With an input I = 101 for a Turing machine M, here is one valid computation history H. In this computation history H, space = *, q_0 = q_y, q_1 = q_p .

#q_y101*#1q_p01*#11q_p1*#111q_p*#111q_h*

This configuration thus ends in the halting state.

11 b.

To begin, here are some defined macros for this problem.

BASE = 7

BASE = 7 is true in this problem because the sum of the number of states, alphabet size, and # are equal to 7.

PLACE(j) = (H div(base)$^{i+1}$ mod(base)^{i})

In this case, H is a number that exists which one can interpret as a computation history of M on I.

SAME(i, j, k, l) = (H div(base)^{j} mod(base)^{i}) = (H div(base)^{l} mod(base)^{k})