

# CS-581: Theory of Computation

## HW #5

**Due Date:** March 2, 2016.

Exercises/Problems for Chapter 5 (page 239 in Third Edition)

**5.3**

**5.4**

Here is a Turing Machine:

$$Q = \{ A, B, C, D \}$$

$$\Sigma = \{ 0, 1 \}$$

$$\Gamma = \{ 0, 1, \_ \}$$

$\delta =$

$$\delta ( A, 0 ) = ( B, 1, R )$$

$$\delta ( A, 1 ) = ( A, 1, R )$$

$$\delta ( A, \_ ) = ( C, \_, L )$$

$$\delta ( B, 0 ) = ( D, 0, L )$$

$$\delta ( B, 1 ) = ( A, 0, R )$$

$$\delta ( B, \_ ) = ( D, \_, L )$$

$$q_0 = A$$

$$q_{ACCEPT} = C$$

$$q_{REJECT} = D$$

**Problem 1.** Convert this into an instance of the PCP.

**Problem 2.** Show that the string "01" is in the language recognized by this TM by showing a solution to your instance of the PCP.