# CS 3530: Assignment 1h

Fall 2023

## Problem 1.46a (10 points)

### Problem

Prove that that the following languages are not regular. You may use the pumping lemma and the closure of the class of regular languages under union, intersection, and complement.

**b.** $\{0^n 1^m 0^n | m, n \geq 0\}$

### Solution

$q = P - K$

$xy^0z = 0^q 10^P$

$P - K! = P$

## Problem 1.53 (10 points)

### Problem

Let $\Sigma = \{0, 1, +, =\}$ and ADD= $\{x = y + z | x, y, z$ are binary integers, and $x$ is the sum of $y$ and $z\}$. Show that ADD is not regular.

### Solution

$i = 2$

$1111 = 100 + 11$

Contradiction proves it is not regular