Assignment 2 - Question 1

due Friday, January 29, 2021

(from DPV) Here’s a problem that occurs in automatic program analysis. For a set of variables $x_1, x_2, \ldots, x_n$ you are given some equality constraints of the form “$x_i = x_j$” and some disequality constraints of the form “$x_i \neq x_j$”. Is it possible to satisfy all of them?

For example, the constraints

$$x_1 = x_2, x_2 = x_3, x_3 = x_4, x_1 \neq x_4$$

cannot be satisfied. Give an algorithm that takes as input $m$ constraints over $n$ variables and decides whether the constraints can be satisfied.