Homework 2

Deadline: Monday, 5 May, 23.59

An undirected graph is 2-colorable if its vertices can be colored with two colors in such a way that the ends of each edge have different colors.

Show that 2-colorability of graphs is in non-uniform AC_1; that is, it can be decided by a family of polynomial circuits of logarithmic depth and arbitrary branching.

Assume that graphs are coded as adjacency matrices, written row by row. For a graph with n vertices, say $1, 2, \ldots, n$, the circuit has input gates $x_{i,j}$ and negated input gates $\bar{x}_{i,j}$, for each pair of vertices i, j.