

Finishing the DP algorithm

Given starting condition x, y with $0 \leq x, y$ and $x + y > 0$, we fill out the matrix $M[., .]$ as follows:

- ▶ We set $M[0, 0]$ to 2
- ▶ We set $M[1, 0], M[2, 0], M[0, 1],$ and $M[0, 2]$ all to 1 (these are the cases where Player 1 wins immediately).
- ▶ For all other pairs i, j with $i \leq x$ and $j \leq y$, we set $M[i, j]$ to 1 if and only if at least one of the following is set to 2:
 - ▶ $M[i - 1, j]$
 - ▶ $M[i - 2, j]$
 - ▶ $M[i, j - 1]$
 - ▶ $M[i, j - 2]$

Otherwise, we set $M[i, j] = 2$.

Class exercise: Fill out the matrix for $x = 4, y = 3$.