Algorithms, February 2021 at CIS

Homework 3

1. Suppose we have a two-player zero-sum game where each player has two actions, and the payoff matrix is:

$$\begin{bmatrix} (-1/2, 1/2) & (3/4, -3/4) \\ (1, -1) & (-3/2, 3/2) \end{bmatrix}$$

   Compute the minimax-optimal strategies of the row and column players, and the value of the game.

2. Give an example of a linear program with d variables, $O(d)$ constraints, and 2^d vertices. Please explain your construction.

3. Consider the linear program: maximize $8x + 6y$ subject to $x + 2y \leq 6$, $5x + 2y \leq 20$ and $x, y \geq 0$. Calculate the optimal solution (x, y).