ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING (A.A. 2019/202019)

POLITECNICO DI BARI
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Surname _____ **Name** _____ **Student ID (Matricola)** _____

We want to model a game where we have two agents MAX and MIN moving on a 2D board. The board is composed by a $N \times N$ grid where the two agents can move freely. Within the board there are $\frac{N \times N}{4}$ *special* cells giving points to MAX **when they are visited for the first time**. Every time MAX visits a *special* cell for the first time it gets 1 point.

The game ends either when the position of MAX is equal to the position of MIN, $position(MAX) = position(MIN)$, or when MAX has visited all the $\frac{N \times N}{4}$ *special* cells: $points(MAX) = \frac{N \times N}{4}$.

The initial position of MAX is the cell (0,0) while the initial position of MIN is (N-1, N-1).
The position for the *special* cells is selected randomly at the beginning of the game.

Consider a cut-off test with a fixed depth of 10 and a utility function for a given state n defined as the distance of MAX from MIN within the board. Feel free to select the distance you like the most (straight line distance, Manhattan distance, etc.).

Optional: Implement alpha-beta pruning to the tree game.