**ĐẠI HỌC QUỐC GIA THÀNH PHỐ HỒ CHÍ MINH**
**TRƯỜNG ĐẠI HỌC KHOA HỌC TỰ NHIÊN**
**KHOA CÔNG NGHỆ THÔNG TIN**


# BÁO CÁO LAB 2

## BỘ MÔN CƠ SỞ TRÍ TUỆ NHÂN TẠO

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# I. Introduce about the algorithm

## a. Idea

- Create the board game with amount of the ROWS appropriate the map
- Create the function check win for the game and it can work with each map
- Starting with the function for the user's turn can play
- Now we starting to find how can make the computer auto play with the user by the algorithm:
  + 3x3 map: use Alpha-beta pruning algorithm. First, we check if we have the winner, game stop and if the player is the AI return 1, is the user return -1 and if draw return 0. After that, check all location can play in the board to find the best way with the algorithm by guess the way user can go.
  + 5x5 map: This like the 3x3 map but because it is bigger than 3x3 and need long time to find so it has two values the represent highest and lowest score respectively for the computer and the user. It can be seen as a ceiling to limit the number of moves the AI have to consider
- Finally, to finish the tic tac toe, draw the board and show the moves of player on it by pygame.

## b. Completeness

- With the 3x3 map: The AI can always be the winner if it has the first turn but not mean it lose the user, it is smart enough to make the game draw
- With the 5x5 map: The AI is still possible win but just sometimes because it has the limit time consider and this is big map so it can't always draw like the 3x3

## c. Time – Space Complexity:

- 3x3:

$$O(b^{m/2})$$

- 5x5:

$$O(b^{m})$$

# II. References


The document in the Computer Science Department at the University of Science, Vietnam National University, Ho Chi Minh City

python-tictactoe-yt/tictactoe.py at master · AlejoG10/python-tictactoe-yt · GitHub

TIC TAC TOE 5x5 In Python With Source Code - Source Code & Projects (code-projects.org)

# III. Link demo

https://youtu.be/FnomF7fiISQ