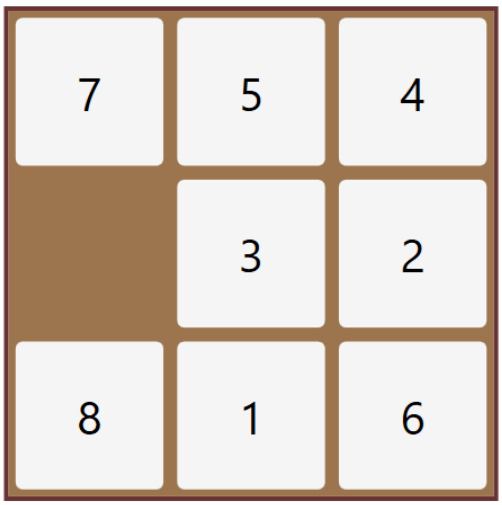
Assignment #1

The purpose of this assignment is to create an AI program that can masterfully play 8-puzzle or Connect 4. You may choose one of them.

8-Puzzle

The 8-puzzle is a square board with 9 positions, filled by 8 numbered tiles and one gap. At any point, a tile adjacent to the gap can be moved into the gap, creating a new gap position. In other words, the gap can be swapped with an adjacent (horizontally and vertically) tile. The objective in the game is to begin with an arbitrary configuration of tiles and move them to get the numbered tiles arranged in ascending order either running around the perimeter of the board or ordered from left to right, with 1 in the top left-hand position.



You need to develop a tool to solve the 8-puzzle problem. Your program should allow the user to:

- Identifies the start and end points
- Choose from two different heuristics
- Choose from two different algorithm (A* & greedy)

You can design the graphical user interface (GUI) as you like, but make sure that your program is user friendly, and its display the tested and solution path.

Connect 4

Is a two-player connection board game, in which the players choose a colour and then take turns dropping coloured discs into a seven-column, six-row vertically suspended grid. The pieces fall straight down, occupying the lowest available space within the column. The objective of the game is to be the first to form a horizontal, vertical, or diagonal line of four of one's own discs. Connect Four is a solved game. The first player can always win by playing the right moves.

You need to develop a tool that allows the computer to play connect 4 Game.
Your program should allow:

- Two player games.
- One player game (Human vs. Computer (**alpha-beta AI**)).
- Level difficulty (Easy, Normal, Hard)

Your program should use:

- Game strategy
  - Use utility and evaluation functions of your choice
  - The better your game strategy, the better your grade in the project.

You can design the graphical user interface (GUI) as you like, but make sure that your program is user friendly.
More information on how to play the game can be found here:

https://www.cbc.ca/kids/games/all/connect-4

Languages

You may use the programming language that you prefer, except python
Note: Zero scores will be given for any code from the internet

Marking scheme

Look and feel of interface	1-5	Algorithm implementation	1-5
Quality of design and coding	1-5		