# Artificial intelligence Final Project

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## Connect four

Connect 4 is a very simple two player game that can entertain you for hours!!  To win this game, it is enough to place 4 discs of the same color in a row or column. Each of the players takes one color of the beads and places them in the game board in turn. The first person to get 4 pieces of the same color in a row or column wins.

You can read the rules of the game on Wikipedia

**1- Implemented the logic of the game (20 points):**
> At first, you have to implement the general logic of the game, so that the player can play with any strategy he wants.

**2- Implementation of the game interface (10 points):**
> The game page has 6 rows and 7 columns.
> You have 2 ways to show the shape of the page and the location of the pieces in the game:

- Using the terminal environment
- Using graphic libraries (10 points)

## 3- Building a Mini-Max tree for the game (30 points):

Construct an appropriate mini-max tree with appropriate depth k for the game. Use logical simplifications to increase the depth of your tree. It is obvious that the depth of the tree has an effect on increasing your working ability.

In your report, explain why you chose the number k.

## 4- Implement of the minimax with alpha beta pruning for the game (20 points)

## 5- Define the heuristic with appropriate parameters for the game (20 points)

Check which parameters are effective for your operator's performance.

Explain your heuristic function in the report.

## 6- reports (5 points):

There is no need to explain the code line by line in the project report. Explain your main functions and general approach.

## 7- Implementing Q-learning Agent and training the model (30 points):

In this section, you have to train an agent with the Qlearning approach.

## Tips:

- The project is done individually.
- If there is a similarity between the codes available on the Internet or a similarity with the code of other students, a score of 0 will be given for your project.
- Scored sections are written in **red**.

What you need to deliver:

Source code of the project and Report.

Good Luck 😊