

**Bound**

Artificial Intelligence 2022/2023

**First CheckPoint**

**Group 17**:

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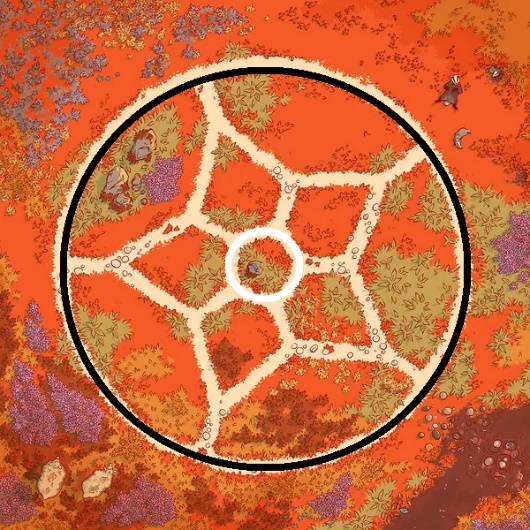
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**Project Specification:**

***Bound*** is a two player strategy game normally played on a single sheet of paper.

- First, the oldest player places 4 black pieces in the outer circle, while the youngest player places 4 pieces in the middle hexagon.



-Each turn, move one of your four standing stones in an attempt to encircle an opponent's stone.



-In the end, whoever manages to encircle the opponent, making it impossible to change a piece, wins.



Completed, the explanation of the game, we begin by explaining how the game is made, as requested in the script, we developed 3 features, Player vs Player, Player vs Computer and Computer vs Computer.

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Descrição gerada automaticamente

Inside the computer, we have developed 3 difficulties, Easy, Medium and Hard that

Uma imagem com texto

Descrição gerada automaticamentediffer from each other through the depths of the developed algorithm (MiniMAX).

**Formulation of the problem as a search problem:**

**State Representation:** LIST ‘POSITIONS’ containing all positions from the board stored in tuples with x and y coordinates. Arrays ‘black\_pieces’ and ‘white\_pieces’ storing the positions of the black and white pieces.

**Initial State:** Empty board (list ‘black\_pieces’ and ‘white\_pieces’ empty).

With the board empty, you start by placing 8 pieces, 4 white and 4 black, both white and black have to be placed in their designated positions and will be saved in another list. A list of initial positions (start\_bpositions and start\_wpositions) was created which contains the 5 positions where they will have to b

**Objective Test:** The objective of the game, which is the same as the game created, is to corner an enemy piece, making it impossible to move. For this, we created a function, called verify, which checks in each move if there is any cornered piece, if not, it allows the game to continue.

**Operators:**

A piece after being placed, can only be moved to its adjacent positions, that is, its closest position that is empty. To make it more intuitive, after selecting the piece that you want to change, display the positions in which it is possible to move it.

For this we create a function called make\_move().

**Algorithms:**

**Implementation work already carried out:**

**Programming language:** Python, with visualization using pygame package.

**Development environment:** Visual Studio Code, GitHub.

**Data Structures:** Nodes and Graphs.

**Reference and Materials:**

- <https://boardgamegeek.com/boardgame/375975/bound>

- Python,with pygame package.

- Visual Studio Code, GitHub.