

Project 2: Shobu Presentation

LINFO1361 - Intelligence Artificielle

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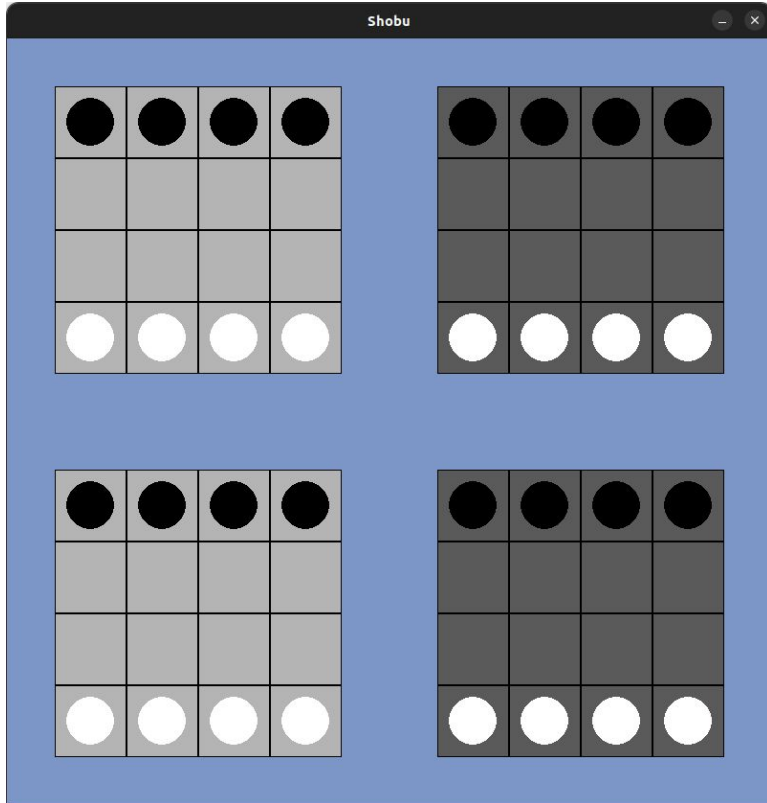
Summary

- How to play Shobu
- Project and grading details

Summary

- **How to play Shobu**
- Project and grading details

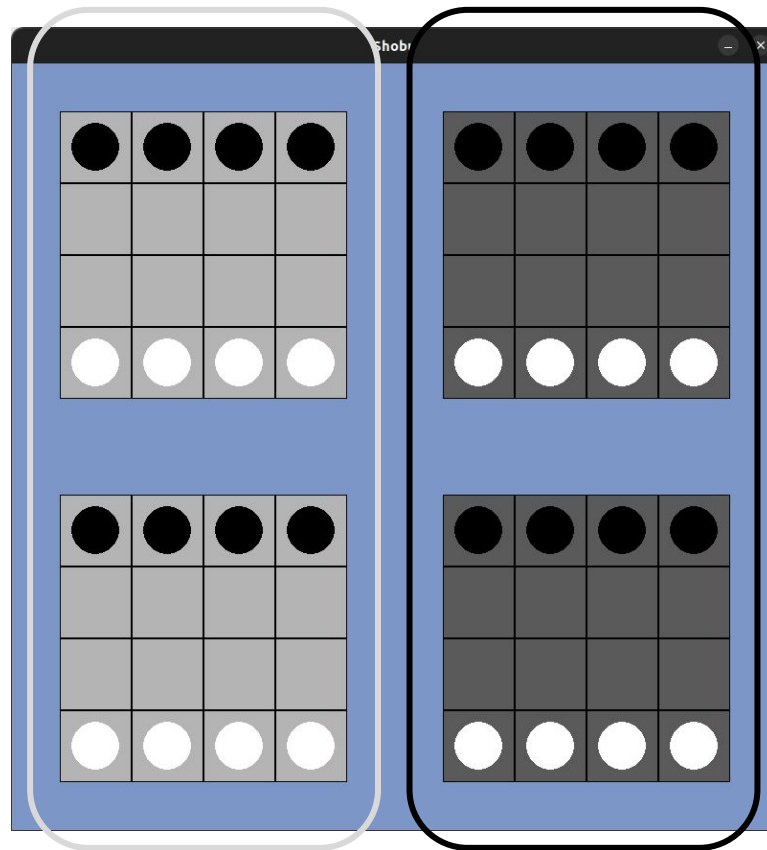
How to play shobu: the boards

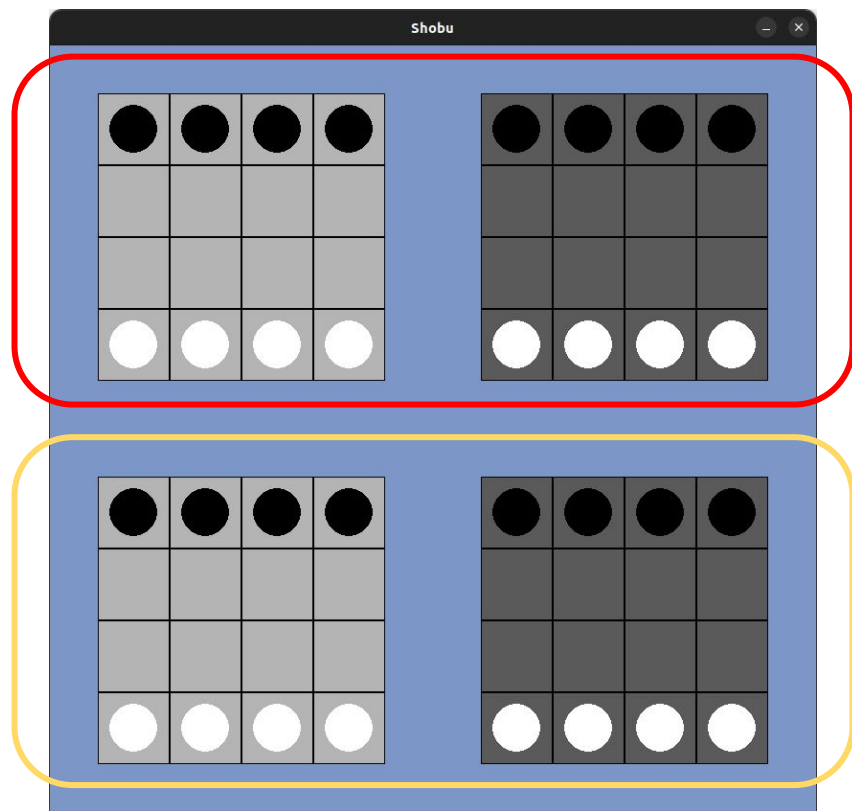


- 2 players
 - white
 - black
- 4 boards
 - 2 light boards
 - 2 dark boards
- 4 pieces per board for each player

Light boards

Dark boards





Opponent's boards

Home boards

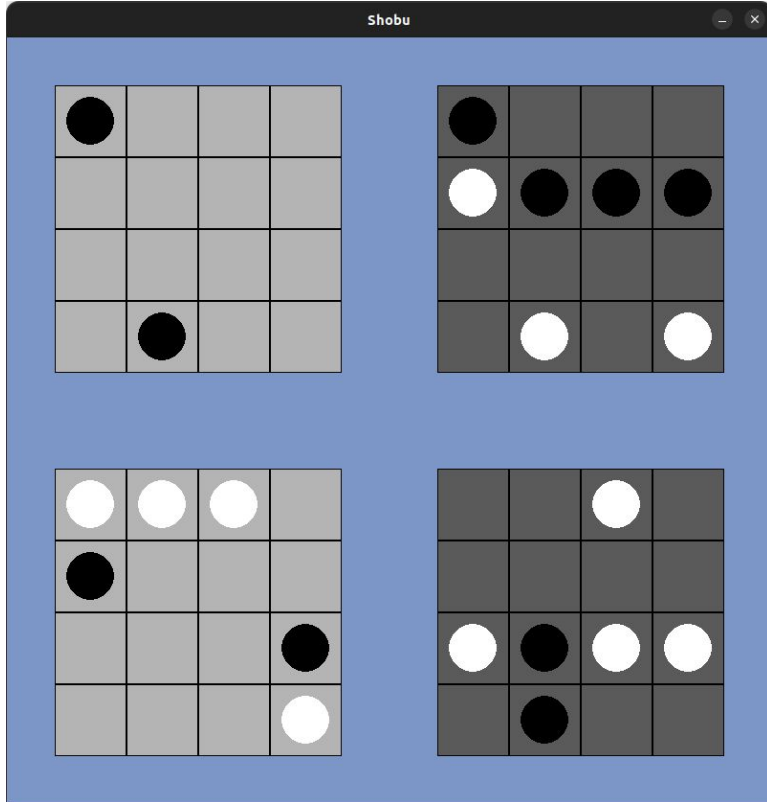
(Playing as white)

How to play shobu: win condition

2 ways to win:

- a player wins when there is no more opponent's piece on 1 of the 4 boards
- a player loses if they can not move while having at least one piece on each board

How to play shobu: win condition



Here, black wins
because white has lost
all his pieces in the top
left board

How to play shobu: movements

An action is made of 2 moves:

- passive move
- active move

How to play shobu: movements

An action is made of 2 moves:

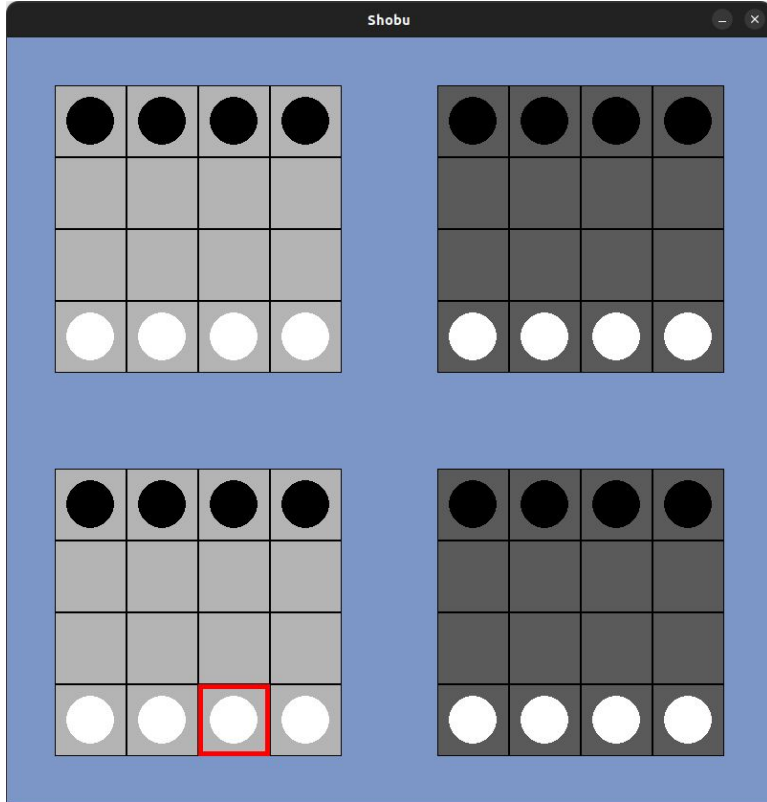
- **passive move**
 - On one of your home boards, light or dark
 - In any direction, by 1 or 2 squares
 - Can **not** push opponent's piece
 - Can **not** jump over your own pieces or push them
 - Can **not** leave the board
- active move

How to play shobu: movements

An action is made of 2 moves:

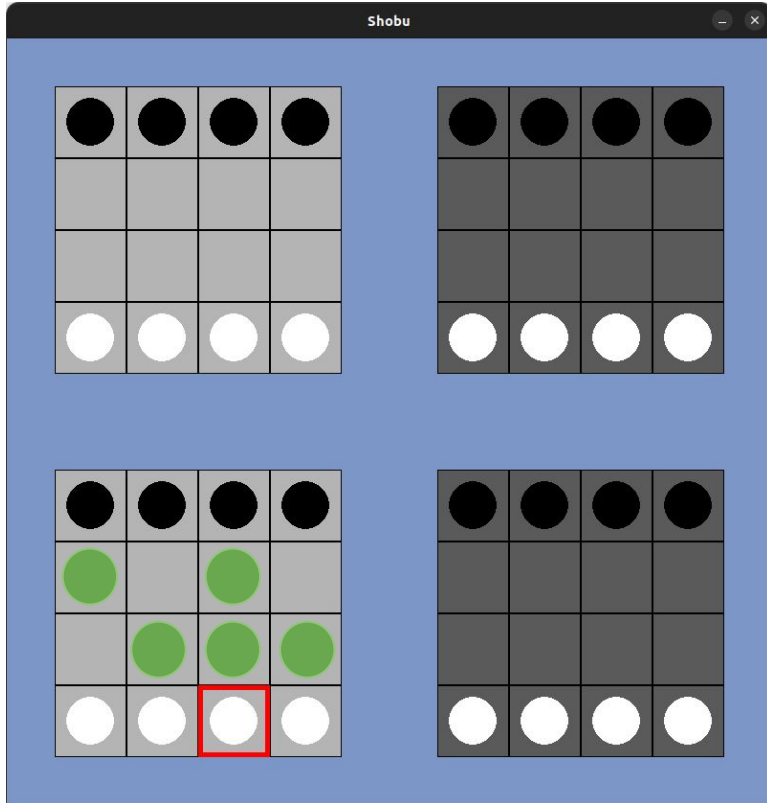
- passive move
- **active move**
 - On a board with the opposite color from the board with the passive move
 - With the same direction and the same length as the passive move
 - Can be any piece on the wanted board, not necessarily one with the same position than the one used in the passive move
 - Can push only **1** opponent's piece
 - Can **not** push your own pieces

How to play shobu: movements



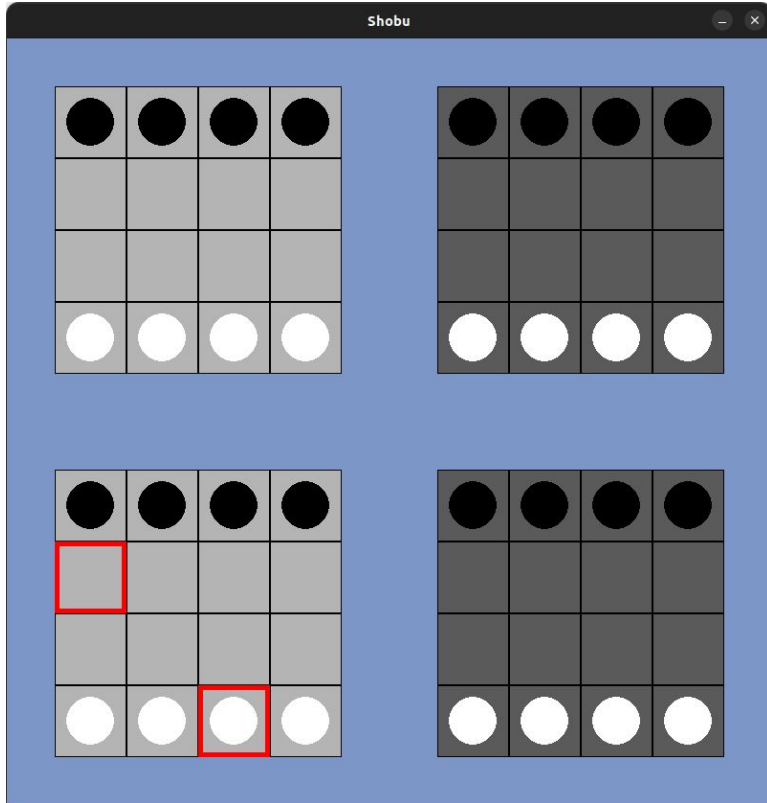
1. Select your passive piece

How to play shobu: movements



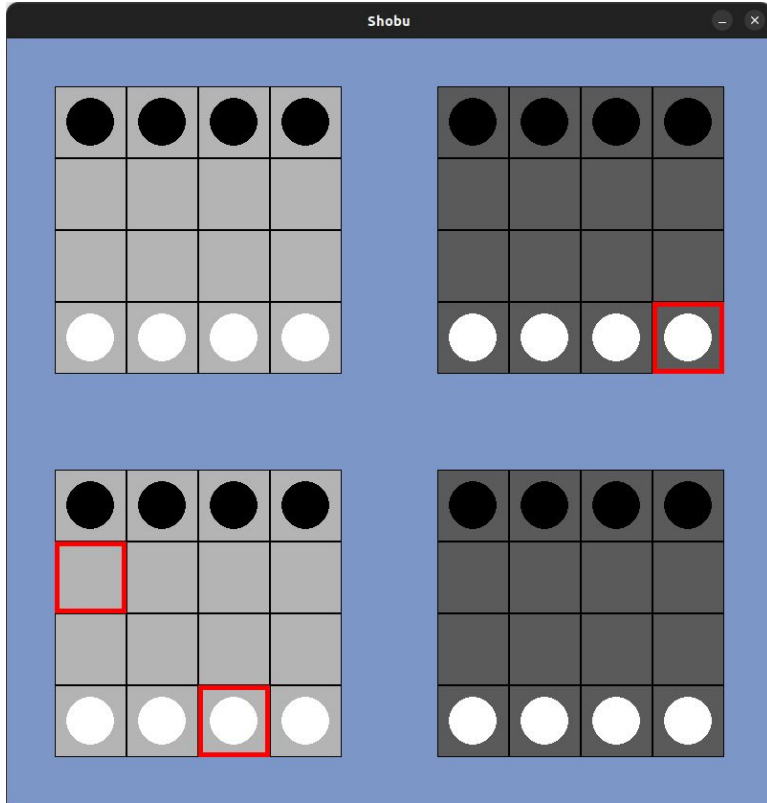
1. Select your passive piece
2. Select your passive move (thus giving the direction and the length)

How to play shobu: movements



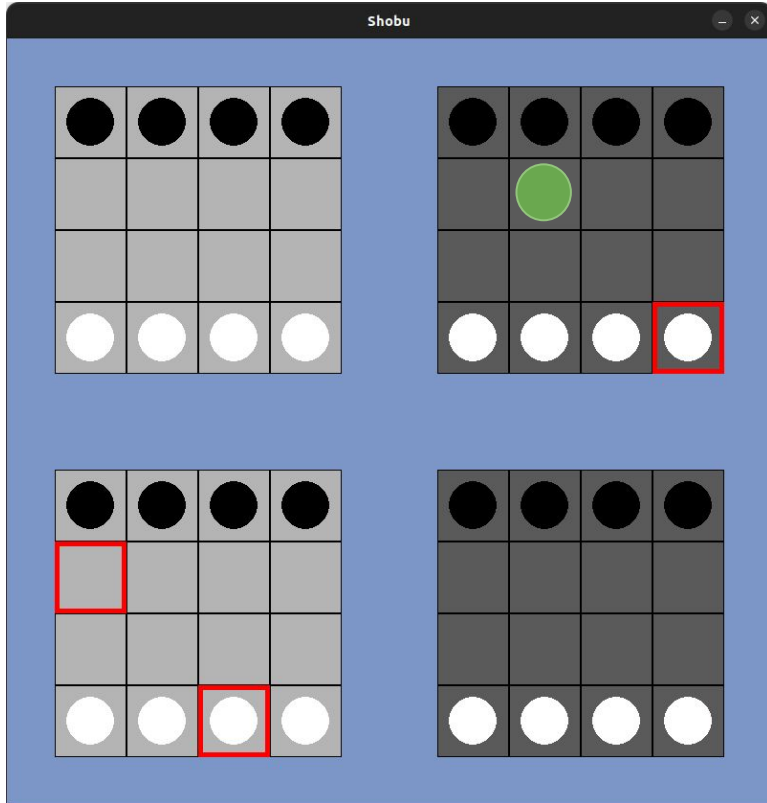
1. Select your passive piece
2. Select your passive move (thus giving the direction and the length)

How to play shobu: movements



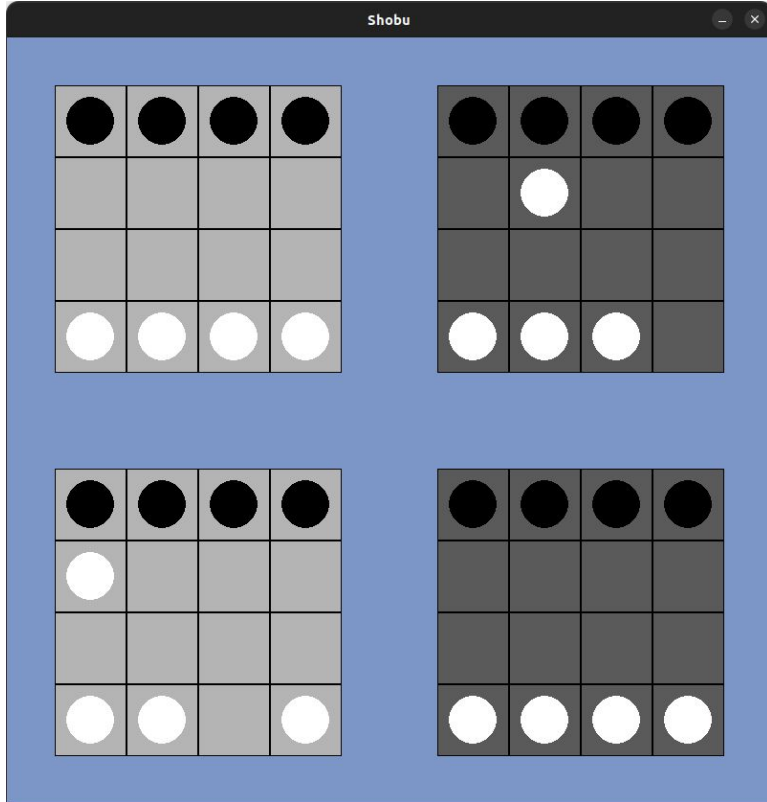
1. Select your passive piece
2. Select your passive move (thus giving the direction and the length)
3. Select your active piece on a board with the opposite color

How to play shobu: movements



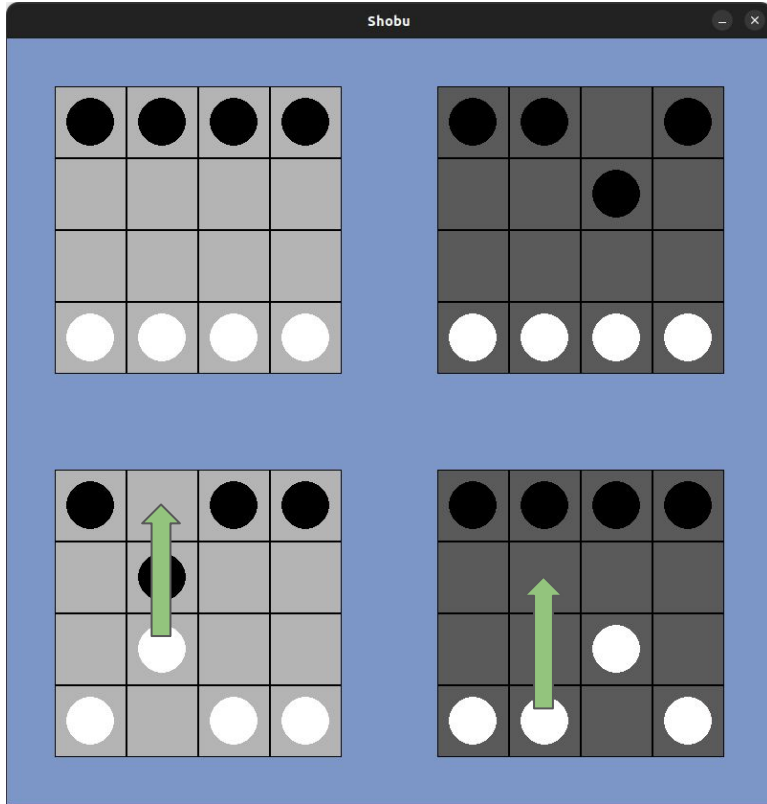
1. Select your passive piece
2. Select your passive move (thus giving the direction and the length)
3. Select your active piece on a board with the opposite color
4. Only one possible active move in this case!

How to play shobu: movements



Done!

How to play shobu: movements

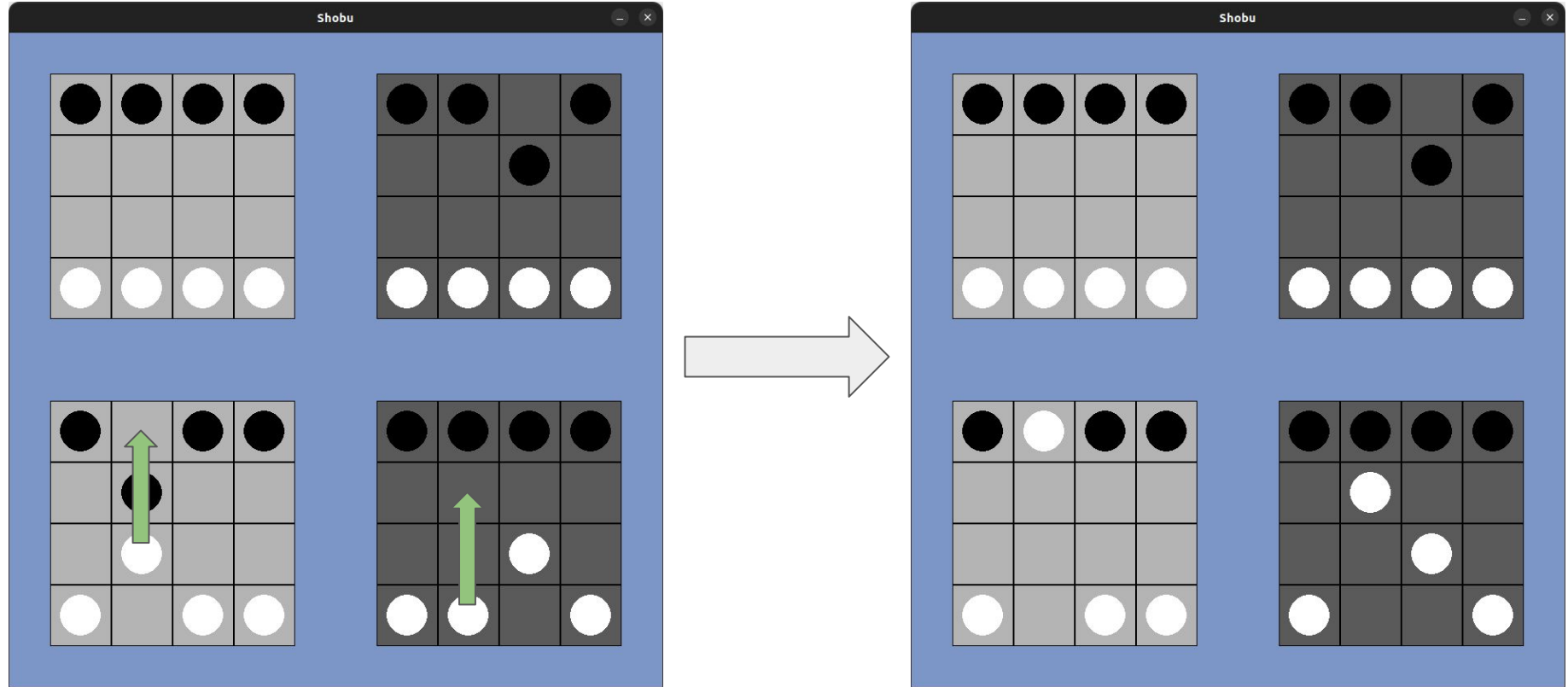


To get rid of the opponent's pieces, just push them off the board

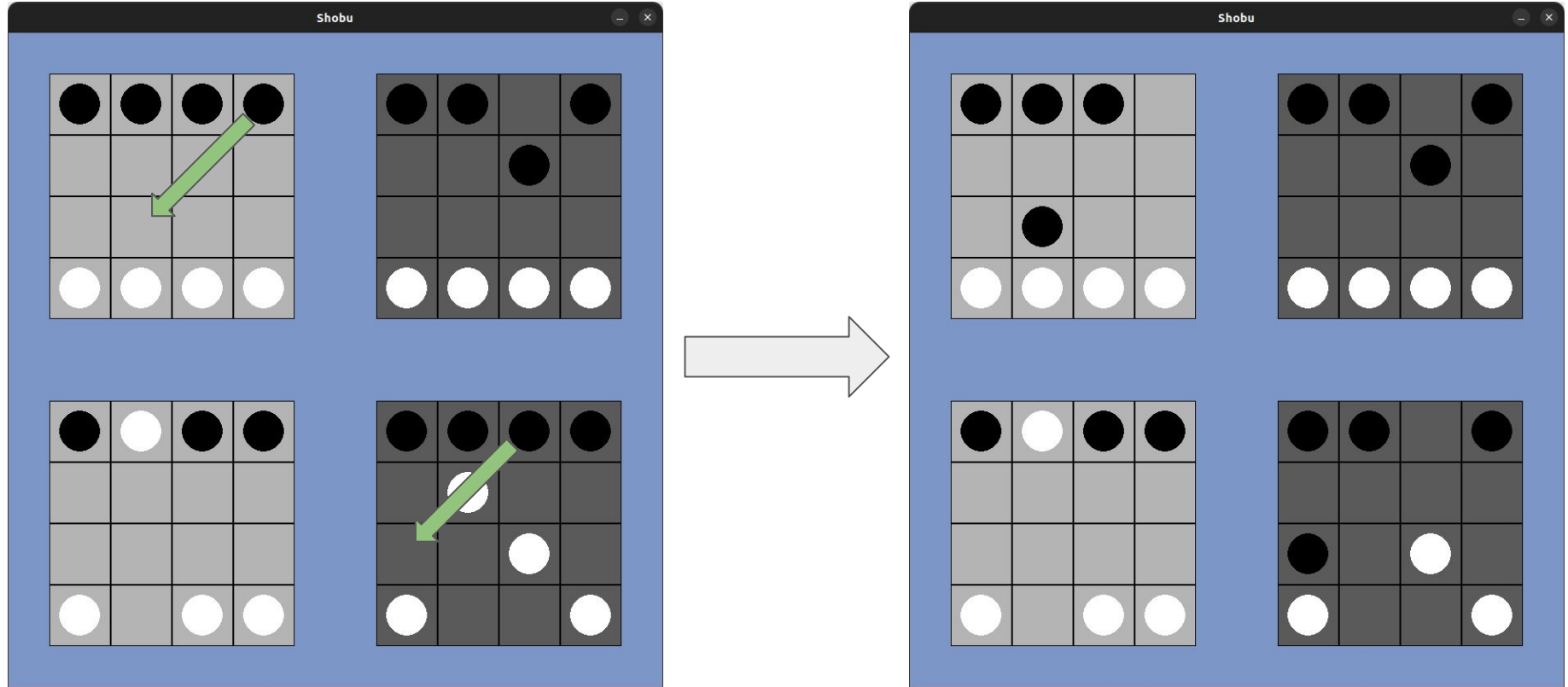
Can push opponent's pieces not matter the length and the direction of the move

Can only push one opponent's piece during the active move

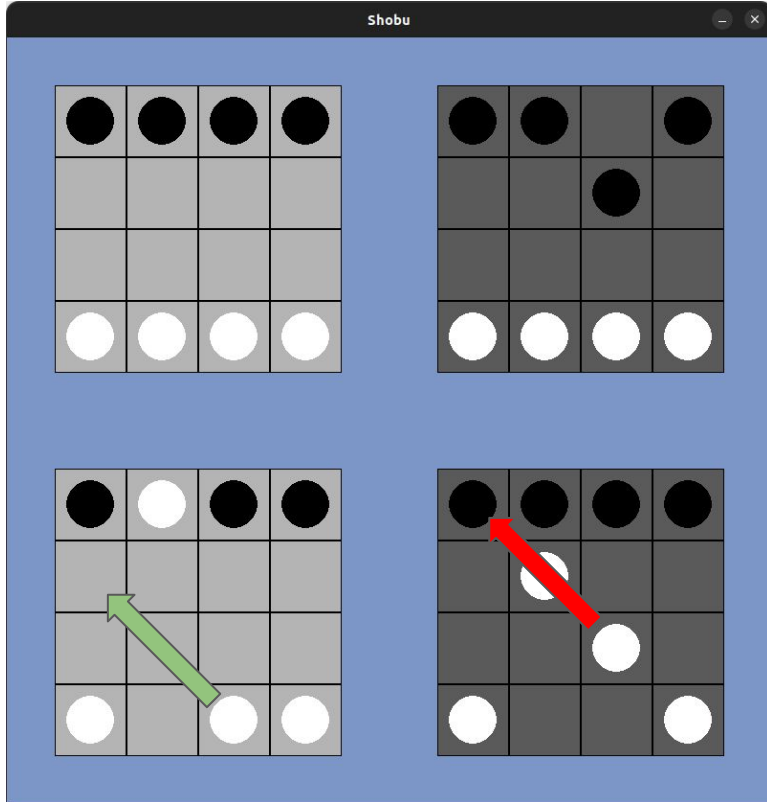
How to play shobu: movements



How to play shobu: movements

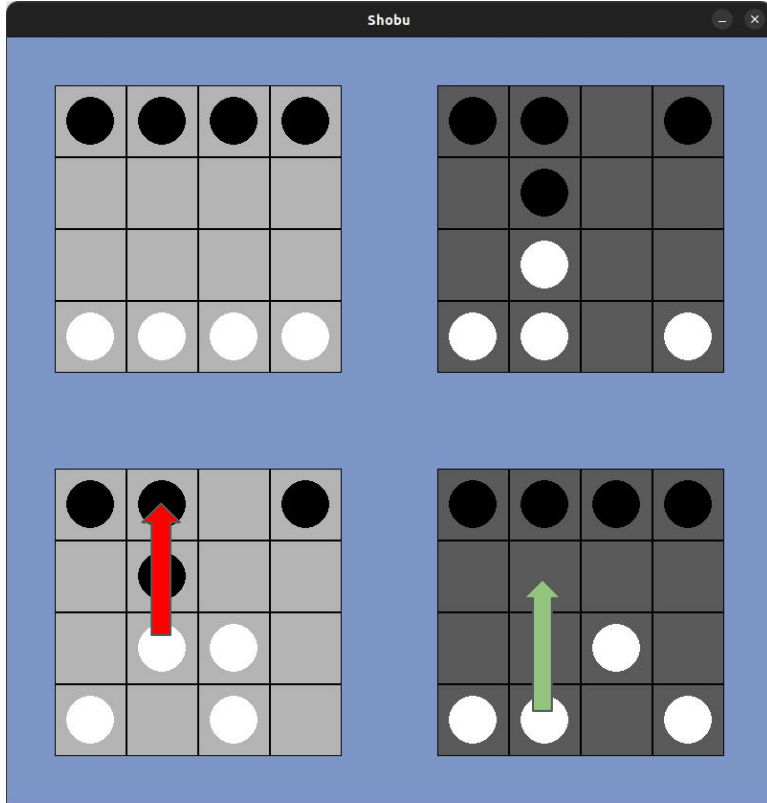


How to play shobu: movements



You can not push your own pieces

How to play shobu: movements



You can not push two opponent's pieces during your active move

How to play shobu



Questions?

Summary

- How to play Shobu
- **Project and grading details**

Project and grading details

Project is split in 3 parts:

- Exercises /5
- Agents /25
- Contest /10

Project and grading details: agents /9

- Alpha-Beta implementation /4
- Monte-Carlo Tree Search implementation (MCTS) /5

For each of them, parts of the implementation is imposed

The heuristic for Alpha-Beta is **imposed**

Each function is evaluated on Inginiuous for each agent

Grading includes theoretical questions in the report

Project and grading details: your agent /16

You can use any implementation, algorithms, ... you want!

BUT - should only be **one** Python file (to submit on Inginious)

- and use the same interface as before

We expect:

- A full explanation of your agent /11
- A comparison between several agents /5

Project and grading details: explanation of your agent /11

You should consider this part as a report like any other project!

Explain your original approach to improve the basic approaches developed before

Did you use another algorithm than Alpha-Beta or MCTS? Explain it.

Did you improve the evaluate function with your own heuristic? Explain it

Did you optimize something in your code for this game specifically? Explain it

Your explanation should be complete. You will receive points for this part according to what you have tried and implemented.

Project and grading details: agents comparison /5

We expect a statistical comparison of at least these 4 agents:

Random, Alpha-Beta, MCTS, your agent

You are free to proceed as you want as long as your method makes sense!

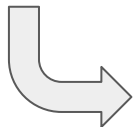
We ask you to draw conclusions based on the results you observe

You will be graded based on your comparison method and the conclusions you draw for the agents on this specific game

Project and grading details: contest /10

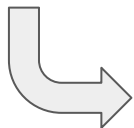
You submit the agent you want (hopefully your custom agent)

If you beat an easy agent



1 point

If you beat an easy and a medium agents



2 points

If you beat an easy, a medium and a hard agents



3 points

Coming soon
on Ingenuous!

Project and grading details: contest /10

**The higher you are in the contest,
the more points you will receive!**

Project and grading details: summary

Total /40

Exercises /5

Basic agents /25

Alpha-Beta /4

MCTS /5

Explanation of your agents /11

Comparison of the agents /5

Contest /10

Project and grading details: dates and deadlines

- 29/02: start
- 07/03: Q&A session
- 14/03: Q&A session + **deadline** Alpha-Beta and MCTS agents
- 21/03: Q&A session
- 28/03: project **deadline**