Master 1 informatique
UFR mathématique et informatique
Université de Paris

Université de Paris

Programmation avancée - Project

Language : Python or C++

Start 9th November, Due 29th November, 23h59 (strict deadline, the project must be validated on before 23h59)

This project is strictly individual (any copying from other students or online sources will be strongly penalized).

If there is any problem or something is not clear, contact Sylvain Lobry by e-mail (@u-paris.fr).

On moodle, you need to send:

- the files of your project. You are free to divide your work in one or several files, but your program should be launched by executing python on main.py or compiling main.cpp (if the compilation line requires more input, please indicate it in the pdf report),

- a pdf report of 5 pages maximum (no minimum) describing and documenting your work.

In addition, we will organize a small individual presentation of your project after the deadline.

You are free to import any module/library you would like as long as it is necessary for your project and it does not fully implement one of the functionalities.

Good luck!

Project: Let's play chess!

In this project, you will program a chess game. If you do not know the rules, they are well covered on Wikipedia. You have a set of requirements to implement to obtain a passing grade. You are rather free in the way you chose to implement them, but it should be documented in the report. There are improvements, which if all correctly implemented would give a perfect grade. Finally, some bonuses are proposed (but you are free to implement other functionalities which could be considered as bonuses).

The goal of this project is to demonstrate that you are able to implement a reasonably complex program in Python or in C++. As such, a particular attention will be put while grading on the quality of the code (including coding style and comments) and the usage of the languages' functionalities seen in class. This should also be shown in your report. **In addition, your report should precise which and how functionalities have been implemented**, and how they can be used.

Required:

At minimum, your program should be able to let two local players to play a game, by showing the board, asking the players for movements and allow for capturing pieces until a king is captured. The implementation should follow the basic rules for movements (i.e. no castling, no en passant nor pawn promotion necessary).

It should also be able to write the game history to a file (in a human-understandable format that you can choose) given as a parameter to the program.

As an example (that you do not have to follow!), an output of a game is given here (where "br" is a black rook, "bk" is a black knight, "bb" is a black bishop, "bQ" is the black queen, "bK" is the black king, "bp" is a black pawn and wr, wk, wb, wQ, wK and wp respectively for white pieces).

Improvements:

- Implement all of the rules (castling, en passant, pawn promotion)
- Implement a clock system
- Allow to draw and to resign
- Detect a check
- Detect a checkmate
- Allow to choose between text notation for the board, or using the Unicode characters for chess pieces
- Write the game history in the PGN Format
- Add the ability to save and load a game
- Add the ability to start a game in a given configuration

Bonuses:

- Add a GUI
- Allow to play online games
- Add an AI
- Rate moves (in the file report)