

## Assignment 4

This assignment must be solved in Python 3.

### Problem 4.1 *Abstract Player Class* Points: 1

Write an abstract class `Player` for a Tic Tac Toe player. It should have

- a constructor that
  - takes the name of the player and stores it in an attribute
- a method `getName` that takes no arguments (except for `self`, of course) and returns the name of the player
- an abstract method `getMove` whose arguments are
  - a board (an instance of the `Board` class)
  - an integer (1 or 2) that indicates whose turn it is
- comments that explain the purpose of the abstract method, namely
  - the meaning of the arguments
  - the expected return value: the pair `(row, column)` representing the move that the player wants to make

### Problem 4.2 *Concrete Player Classes* Points: 1

Import your solution from the above problem.

Implement three different classes that inherit from `Player` and implement the abstract method:

- a class `RandomPlayer` that makes a random move
- a class `SmartPlayer` that makes a good move (try to make as good a move as possible)
- a class `HumanPlayer` that asks the user for moves (using the `input` function)

### Problem 4.3 *A Better Game Class* Points: 1

Change your class `Game` from Problem 3.3 as follows:

- the constructor should take two objects of class `Player` as arguments instead of two names
- the method `run` should not ask for moves; instead, it should call the method `getMove` to obtain the moves

**Problem 4.4** *A Competition*

Points: 1

Import your solutions from the above problems.

Write a program that creates one instance each of `RandomPlayer` and `SmartPlayer` and lets them play 20 games against each other. (Each player should go first 10 times.) At the end, the program should print the statistics of which player won how many games.

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You have to submit your solutions via *Grader* at <https://grader.eecs.jacobs-university.de>

**Unless mentioned otherwise, all problems are due  
Tuesday, February 23th, 18:00 h**

After the deadline it will not be possible to submit solutions. It is useless to send solutions then by mail because they will not be accepted.