Advanced Programming in Python   Course: JTSK-350112
Jacobs University Bremen   February 11th, 2016
Dr. Florian Rabe   .

Assignment 1

This assignment must be solved in Python 3.

Material These assignments do not involve new material. You should be able to solve them based on your knowledge from the previous lab. Use them to test whether you need to revise the material of the first lab.

Tic Tac Toe Boards We represent a Tic Tac Toe board as a list of lists like

```
board = [ [a, b, c], [d, e, f], [g, h, i] ]
```

where the fields are

```
 a | b | c
-----------
 d | e | f
-----------
 g | h | i
```

The values `a, b, c, d, e, f, g, h, i` are integers using `0` for empty fields, `1` for fields of player 1 and `2` for fields of player 2.

Problem 1.1 *Printing*   Points: 1

Write a function that takes as input a Tic Tac Toe board and prints it. It should use print X for player 1 and O for player 2.
For example, if you call your function with `[ [1, 0, 2], [0, 1, 0], [2, 0, 1] ]`, the function should print

```
 X |   | O
-----------
   | X |
-----------
 O |   | X
```

Write a program that calls your function with an example board.

Problem 1.2 *Checking for a Winner*   Points: 1

Write a function that takes as input a Tic Tac Toe board and returns
- 0 if all fields are filled
- 1 if there is an empty field and it's player 1's turn
- 2 if there is an empty field and it's player 2's turn

Write a function `hasWon` that takes as input a Tic Tac Toe board and an integer i that is either `1` or `2`. It should return
- `True` if player i has won
- `False` otherwise

Problem 1.3 *Tic Tac Toe Program*   Points: 2

Write a program for 2 players to play Tic Tac Toe.
- It should ask for the names of the players. Then it should alternate between the players each time asking for their moves.
- After every move, it should print the current board like above.
- After every move the program should check whether someone has won and if so announce the winner. Otherwise, it should announce a draw at the end.

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

Unless mentioned otherwise, all problems are due
Tuesday, February 16th, 24:00 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.