



CS217: Computer Programming Language: Nested loop lab

Instructor: Jakramate Bootkrajang

Exercise 1

- Write a function that takes an integer n as input, and print the following pattern upto n lines

```
1
12
123
1234
12345
```

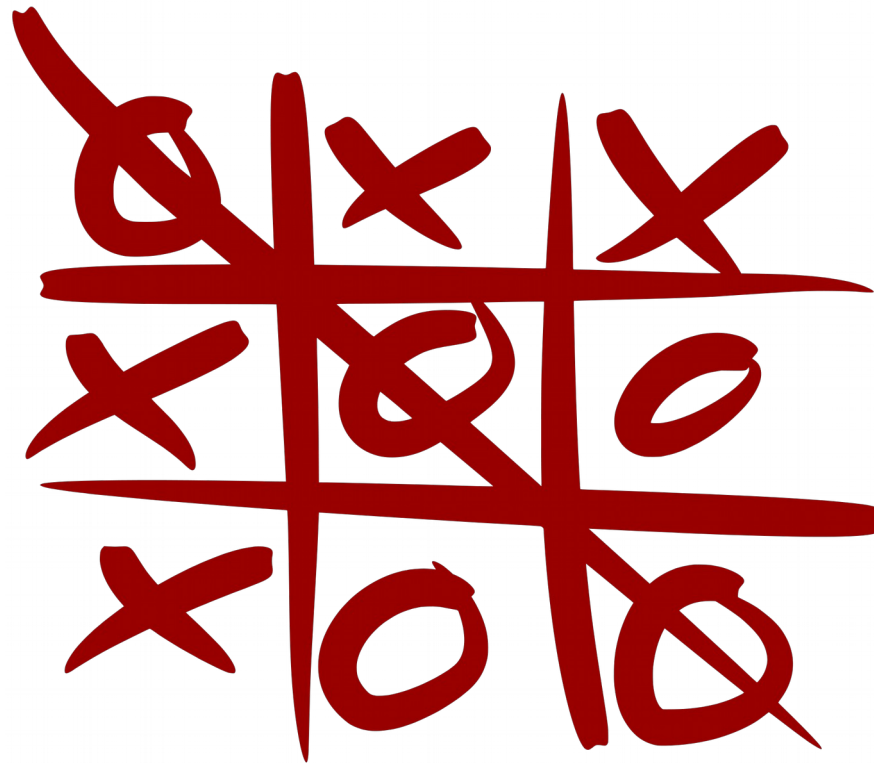
Exercise 2

- Write another function that takes as input an integer n and do the opposite of the previous function, that is

```
54321
4321
321
21
1
```

Exercise 3: Tic-Tac-Toe

- We will try to implement the famous game of Tic-Tac-Toe





Specs

- A turn-based game with 2 players
- The program will ask each player in turn where to make a move
- After receiving input from each player, the program update the board and print the current game state

Game design questions

- How do we represent the board ?
- How do we refer to each square on the board ?
 - 1,2,3,4...9 or (1,1),(1,2),(1,3),(2,1),(2,2)...
- How do we represent a move by a player ?
 - 'X' or 'O' or what ?

The board

- We could use list to represent board's state
- List in Python is a collection of objects
- List can be constructed using square brackets
 - $A = [1, 2, 3, 4, 5]$ or
 - $B = ["a", "b", "c", "d"]$
- List is string's cousin
 - Element can be accessed by $A[\text{index}]$
 - Eg., $A[0]$ is 1, $B[3]$ is "d"
 - List is mutable
 - $B[3] = "z" \rightarrow B$ is now $["a", "b", "c", "z"]$ 7 / 12

Our board

- We will use list to store board's state
 - board = [0, 0, 0, 0, 0, 0, 0, 0, 0]
- Zero represents empty cell
- 'X' may represent one player and '0' the other

Exercise 3.1

- Define a board and
- Write a function named `print_board()` to print current board's state
- Example

```
0 0 0
0 0 0
0 0 0
```

Exercise 3.2

- Write a function which takes as input a character representing player and an integer representing a cell, and simulate a move
- We may consider indexing a cell by number 1 to 9

1 2 3
4 5 6
7 8 9

- Your function should modify board's state

Exercise 3.2 (cont)

- Suppose your board is
 - board = [0, 0, 0, 0, 0, 0, 0, 0, 0]
- move('x', 3)
- The board will be
 - board = [0, 0, 'x', 0, 0, 0, 0, 0, 0]



Exercise 3.3

- Write the game's main loop which
 - Print current board's state
 - Ask user for the move
 - Until no more move can be made