

BIG DATA & ANALYTICS.

Lab01: Sequential-solving Programming Exercise

BACKGROUND.

The Irish Collegiate Programming Contest (IrlCPC) is a programming competition organised by the UCC's ACM Student Chapter and sponsored by Google, Microsoft, Workday, The Insight Centre for Data Analytics and the School of Computer Science and Information Technology (UCC).

This contest is open to student teams with 2-3 members from Irish third level institutions and will test the participating teams on their combined knowledge of algorithms, programming and problem solving abilities.

For more information in the event:

<https://www.ucc.ie/en/compsci/events/irish-collegiate-programming-competition-irlcpc.html>

In this first lab we are going to solve one of the problems proposed in the 2017 edition. The problem was proposed by my former colleague Milan de Cauwer and is presented in the next section.

You can see the whole set of problems proposed on that edition in the following link:

<http://multimedia.ucc.ie/Public/training/cycle2/IrlCPC-ProblemSet2017.pdf>

LAB EXERCISE.

Implement the following functions in the Python file P1.py to come up with a solution for the problem being proposed.

1. parse_in

- The function receives as input the name of the file to be parsed (e.g., “input_1.txt”) and returns as output the tuple (num_rows, num_columns, matrix).

For example, if “input_1.txt” is passed as input then the tuple being returned is:

■ num_rows => 3

■ num_columns => 5

■ matrix => [['o', 'x', 'o', 'x', 'o'], ['o', 'o', 'o', 'x', 'x'], ['o', 'o', 'o', 'o', 'o']]

2. solve

- The function receives as input the tuple (num_rows, num_columns, matrix) and returns as output the tuple (num_rows, num_columns, sol_matrix).

For example, if “input_1.txt” is passed as input the tuple being returned is:

■ num_rows => 3

■ num_columns => 5

■ matrix => [['1', 'x', '3', 'x', '3'], ['1', '1', '3', 'x', 'x'], ['0', '0', '1', '2', '2']]

3. parse_out

- The function receives as input the tuple (num_rows, num_columns, sol_matrix) and generates the output file “output.txt”.