Algorithmic Methods of Data Mining

Homework 1

Due: 25/10/2020, 23:59

Instructions

You must hand in the homeworks electronically and before the due date and time.

The first homework has to be done by each **person individually**.

Handing in:
You have to create a public Github repository, that you are going to share with us filling this Google Form (compulsory, otherwise we will not be able to correct your homework). The content of the repository is up to you. The mandatory files are:

- **README.md**: a Markdown file that explains the content of your repository. This is an example. It is important that for each file/folder you say what it contains. Here a cheatsheet to use Markdown.

- **scripts.py**: a .py file that contains any solution of the exercise you completed. Alternatively, you can also produce a Jupyter Notebook, where each cell contains an exercise.

- **stamps/**: a folder that contains all the screenshot that assess the successful exercises you did. You can find all of your submissions in your Hackerrank profile.

For information about collaboration, and about being late check the web page.

Problem 1. The goal of the first assignment focuses on building up your skills on Python. The assignment is done electronically using the HACKERRANK online service available from the following URL:

`https://www.hackerrank.com`

You must create an account and complete as many challenges as you can from the list included below. When you are finished and want to submit your assignment, from the `hackerrank` site, go to the *submissions* page under your profile and produce a PDF printout. This is available from the following url:

`https://www.hackerrank.com/submissions/all`

Your solutions must include as attachment:

- The pdf file that you created.

- The Python code of your solutions, clearly organized.

Don't forget to check the collaboration policy at the course web page. To summarize, you can discuss with each other, but the writing at the end should be yours. In addition, you should preferably not look at the solutions provided by HACKER-RANK; if you do so, you should explicitly mention it in the corresponding response.

Let's go to the homework. The Python challenges that you need to complete are the following:

- Introduction (all – total: 7 - max points: 75)
  `https://www.hackerrank.com/domains/python/py-introduction`

- Data types (all – total: 6 - max points: 60)
  https://www.hackerrank.com/domains/python/py-basic-data-types

- Strings (all – total: 14 - max points: 220)
  https://www.hackerrank.com/domains/python/py-strings
  https://www.hackerrank.com/domains/python/py-strings/2

- Sets (all – total: 13 - max points: 170)
  https://www.hackerrank.com/domains/python/py-sets
  https://www.hackerrank.com/domains/python/py-sets/2

- Collections (all – total: 8 - max points: 220)
  https://www.hackerrank.com/domains/python/py-collections

- Date and Time (all – total: 2 - max points: 40)
  https://www.hackerrank.com/domains/python/py-date-time

- Exceptions (only 1 - max points: 10)
  https://www.hackerrank.com/challenges/exceptions

- Built-ins (only 3 - max points: 80)
  https://www.hackerrank.com/challenges/zipped
  https://www.hackerrank.com/challenges/python-sort-sort
  https://www.hackerrank.com/challenges/ginorts

- Python Functionals (only 1 - max points: 20)
  https://www.hackerrank.com/challenges/map-and-lambda-expression

- Regex and Parsing challenges (all – total: 17 - max points: 560)
  https://www.hackerrank.com/domains/python/py-regex
  https://www.hackerrank.com/domains/python/py-regex/2

- XML (all – total: 2 - max points: 40)
  https://www.hackerrank.com/domains/python/xml

- Closures and Decorations (all – total: 2 - max points: 60)
  https://www.hackerrank.com/domains/python/closures-and-decorators

  Numpy (all – total: 15 - max points: 300)
  https://www.hackerrank.com/domains/python/numpy
  https://www.hackerrank.com/domains/python/numpy/2

Problem 2. We continue in this question with the implementation of some algorithms in Python.

As before, when you are finished and want to submit your assignment, from the hackerrank site, go to the *submissions* page under your profile and produce a PDF printout. This is available from the following url:

https://www.hackerrank.com/submissions/all

Your solutions must include as attachment:

- The pdf file that you created.

- The Python code of your solutions, clearly organized.

Let's go to the homework. The Python challenges that you need to complete are the following:

- `https://www.hackerrank.com/challenges/birthday-cake-candles`

- `https://www.hackerrank.com/challenges/kangaroo`

- `https://www.hackerrank.com/challenges/strange-advertising`

- `https://www.hackerrank.com/challenges/recursive-digit-sum`

- `https://www.hackerrank.com/challenges/insertionsort1`

- `https://www.hackerrank.com/challenges/insertionsort2`