

Algorithmic Methods of Data Mining

Homework 1

Due: 18/10/2026, 23:59

Instructions

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

The homework has to be done by each **person individually**. It will **not** be graded but it must be done if you want to do the short exam.

The goal of the homework is to teach you some basic programming. You need to know programming it both for the written exam (1 question is going to be about programming) as well as in your professional life. If you give it to an LLM you can provide an excellent solution, but you will not learn; this will cost you later in the exam, in the data-science program and professionally.

Handing in:

Instructions for handing in the homework will be provided soon.

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.

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

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>