

Starting to program in Python for Data science - the essentials -

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Week 2 of the DAPOM course (1)

What you did last week

- Set up your programming environment (Python for the language, Atom with Teletype for editing, and Gurobi for optimization)
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- Learned how to execute a simple Python program
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- Learned how to open and read the content of a text file
- A few elements of the Python language

What we do this week

- Learning how to read and write a .csv file

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- Learning the basics about lists in Python

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- Learning about the iteration “for” statement in Python and how to apply it on lists

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- Learning about the conditional “if” statement in Python

What we will do in general: learn programming

...What is programming?

- For those who start to learn programming: A **different way** of thinking (problem solving oriented)
 - **Using** existing algorithms (easy)
 - Building and using **data structures** (medium hard)
- An **attitude** (don't give up)
- Writing **effective** code (easy)
- Conceiving **algorithms** (hard)
- **Testing** and debugging (hard)

What is an algorithm?

- Specifically for Python, an Algorithm is: A **procedural** way (step by step, with iterations and choices, depending on the context) to solve a problem

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- Example of a typical OM/OR problem: Vehicle routing (**optimization**)

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- Necessary mechanism for such an algorithm: investigate **alternatives**
- To get **all** the possible alternatives, one has generate routes via **all** permutations of the points to visit