Programming fundamentals with Python

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Plan for today

Computational thinking

Pattern matching

Algorithms

Decomposing

Computational thinking

If you can't solve a problem without programming, you can't solve it with programming

- Victor Klang

Computational thinking

In order to solve a problem with programming, we need to know what's that problem, and what rules it follows.

Only then we will be able to solve it usign programming.

Computational thinking

Example: Chess

Do you know how chess works?

- When is a chess match won?
- How many types of pieces there are?
- How do they move?
- How do they capture other pieces?

Decomposing

The first step in order to solve a problem is to know which are the steps we want to do

Decomposing

What do we need to do in order to create a program to play chess?

- Create a board
- Place the pieces on the board
- How do pieces move? and when?
- How do pieces capture?
- When is the game considered finished?

Pattern matching

When pattern matching we want to identify similarities between the different entities that interact in the problem.

Pattern matching

What similarities do we find in chess?

Movement? capture? turns?

Algorithms

The final step of computational thinking is modeling the algorithm to resolve the problem.

Algorithms

What algorithm (process) should we follow each turn in chess?