

Intro: Why Study Algorithms?

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Data Structures and Algorithms
Algorithmic Toolbox

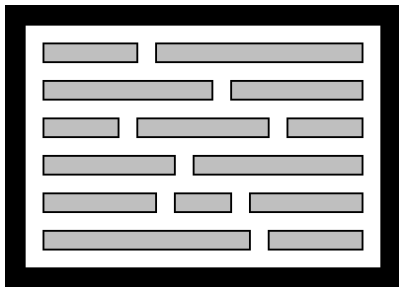
Learning Objectives

- Understand the type of problem that will be covered in this class.
- Recognize some problems for which sophisticated algorithms might not be necessary.
- Describe some artificial intelligence problems which go beyond the scope of this course.

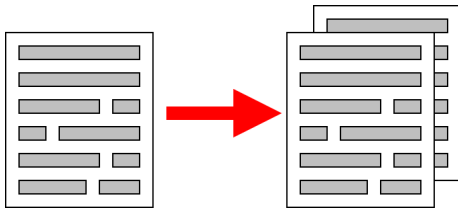
Straightforward Programming Problems

- Has straightforward implementation.
- Natural solution is already efficient.

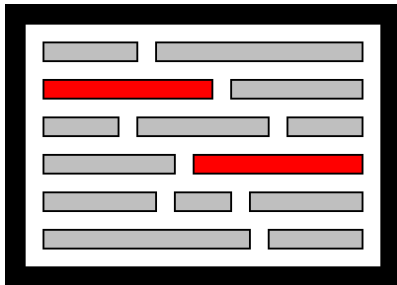
Display given text



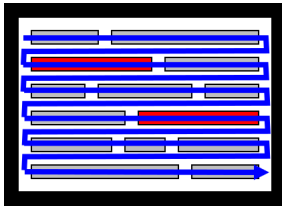
Copy a File



Search for a Given Word



Search for a Given Word



Linear Scan.

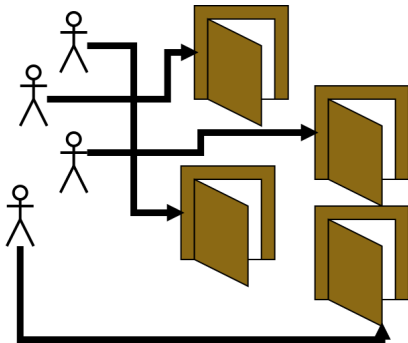
Simple Programming Problems

- Has linear scan.
- Cannot do much better.
- The obvious program works.

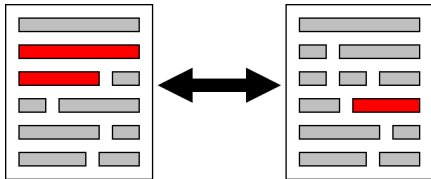
Algorithms Problems

Not so clear what to do.

Find the Best Assignment of Students to Dorm Rooms



Measure Similarity of Documents



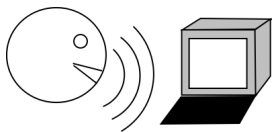
Algorithms Problems

- Not clear how to do
- Simple ideas too slow
- Room for optimization

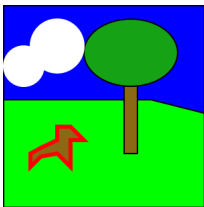
Artificial Intelligence Problems

Hard to even clearly state.

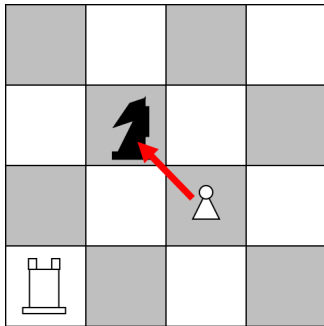
Understand Natural Language



Identify Objects In Photographs



Play Games Well



What We'll Cover

Focus on algorithms problems.

- Clearly formulated.
- Hard to do efficiently.