Introduction: Why Study Algorithms?

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Algorithmic Design and Techniques
Algorithms and Data Structures at edX

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.
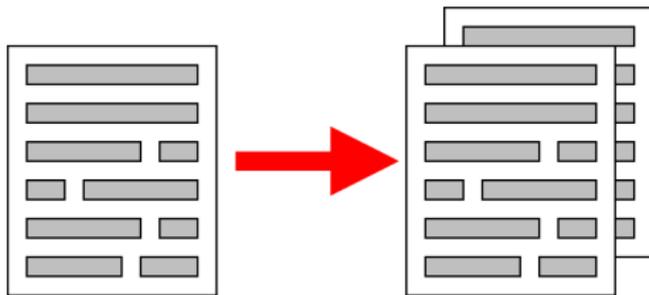
Straightforward Programming Problems

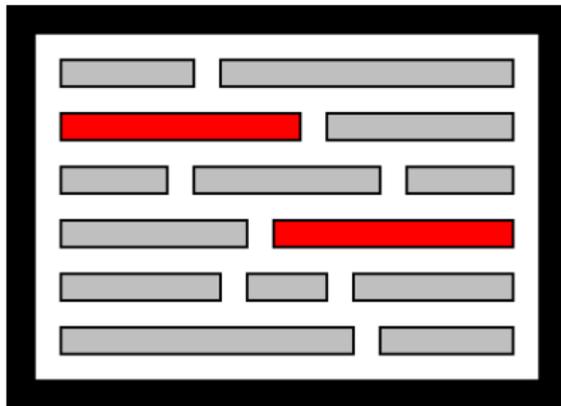- Has straightforward implementation.
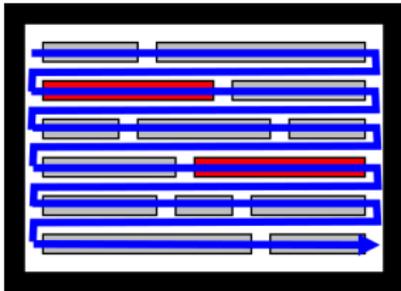- Natural solution is already efficient.

Display given text
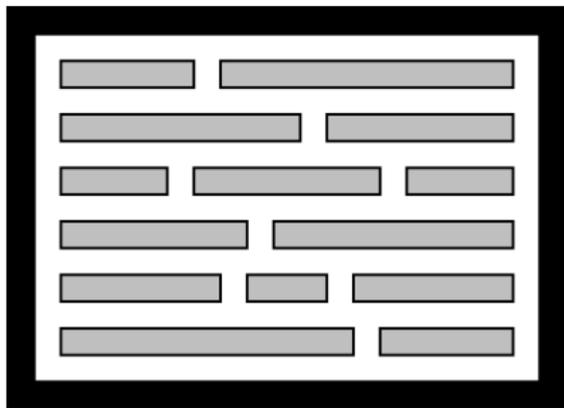
Copy a File

Search for a Given Word
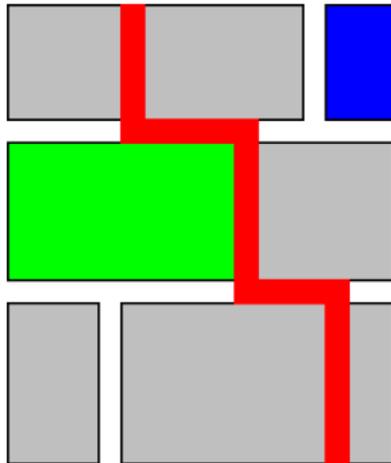
Search for a Given Word

Linear Scan.

Simple Programming Problems

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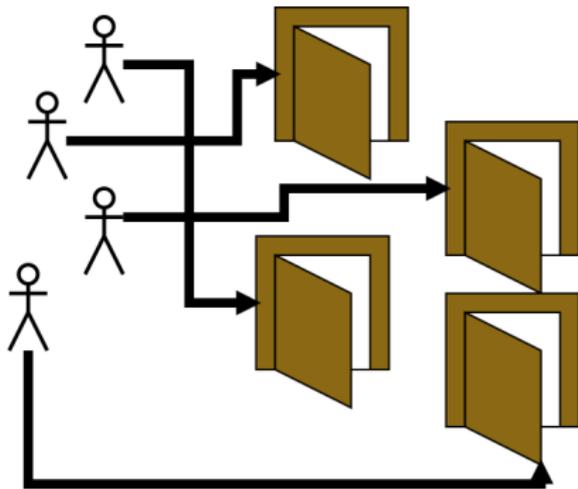- Cannot do much better.
- The obvious program works.
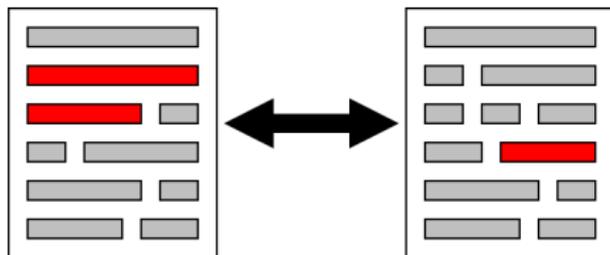
Algorithms Problems

Not so clear what to do.

Find the Shortest Path Between Locations

Find the Best Assignment of Students to Dorm Rooms
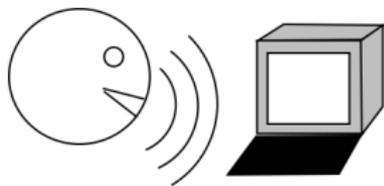
Measure Similarity of Documents

Algorithms Problems

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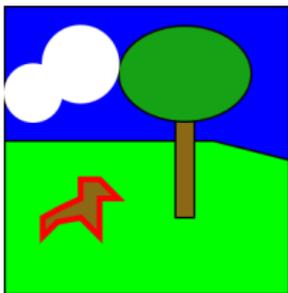- Simple ideas too slow
- Room for optimization

Artificial Intelligence Problems
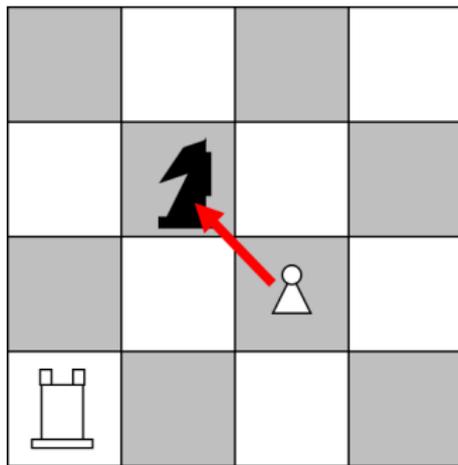
Hard to even clearly state.

Understand Natural Language

Identify Objects In Photographs

Play Games Well

What We'll Cover

Focus on algorithms problems.

- Clearly formulated.
- Hard to do efficiently.