

# Introduction: Why Study Algorithms?

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Algorithmic Toolbox  
Data Structures and Algorithms

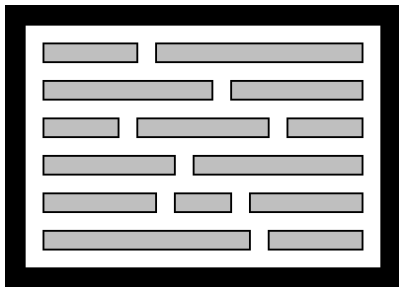
# Learning Objectives

- 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.

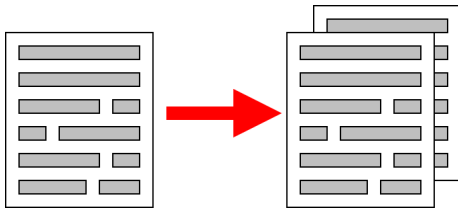
# Straightforward Programming Problems

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

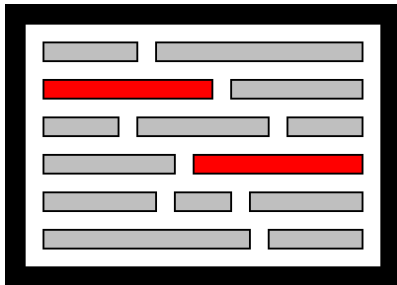
# Display given text



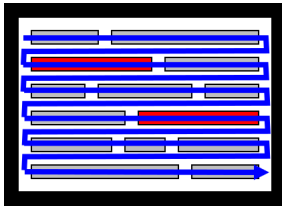
# Copy a File



# 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.

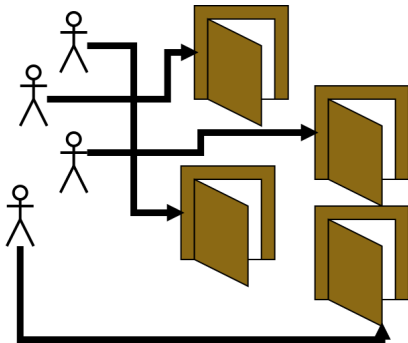


# Algorithms Problems

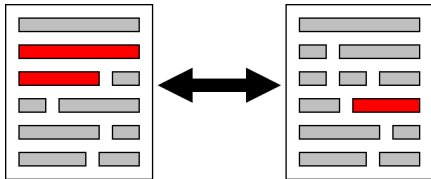
Not so clear what to do.



# Find the Best Assignment of Students to Dorm Rooms



# Measure Similarity of Documents



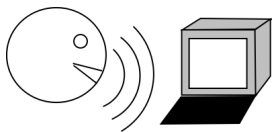
# Algorithms Problems

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

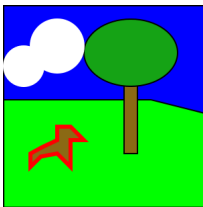
# Artificial Intelligence Problems

Hard to even clearly state.

# Understand Natural Language

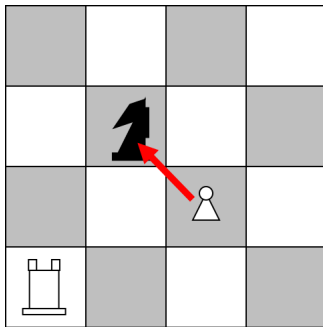


# Identify Objects In Photographs





# Play Games Well



# What We'll Cover

Focus on algorithms problems.

- Clearly formulated.
- Hard to do efficiently.