CPSC:435 Algorithms Introduction

Algorithm- A procedure for solving computational problem (ex. sorting a set of integers) in a finite number of steps. More specifically: a step-by-step procedure for solving a problem or accomplishing something (especially using a computer).

Solving a Computational Problem

- Problem definition and specification
  - Specify input, output, and constraints
- Algorithm analysis & design
  - Devise a correct & efficient algorithm
- Implementation planning
- Coding, testing, and verification

Figure 1: Algorithm Diagram

Examples

- RSA
  - Cryptography
- Quicksort
  - Databases
- FFT
  - Signal processing
- Huffman codes
  - Data compression
- Network flow
  - Routing internet packets
- Linear programming
  - Planning, decision-making

What is CPSC:435?

- Learn well-known algorithms and the design and analysis of algorithms.
- Examine interesting problems
- Devise algorithms for solivng them
- Data structures and core algorithms
- Analyze running time of programs