Algorithm Analysis

Slides by Christopher M. Bourke
Instructor: Berthe Y. Choueiry

Fall 2007

Computer Science & Engineering 235
Section 3.3 of Rosen
cse235@cse.unl.edu

Introduction

Algorithm Analysis

CSE235

Analysis of Algorithms

Mathematical Analysis of Algorithms

Examples

Useful Tools

How can we say that one algorithm performs better than another?

Quantify the resources required to execute:

- Time
- Memory
- I/O
- circuits, power, etc

Time is not merely CPU clock cycles, we want to study algorithms *independent* or implementations, platforms, and hardware. We need an objective point of reference. For that, we measure time by "the number of operations as a function of an algorithm's *input size*."

Input Size

For a given problem, we characterize the input size, n, appropriately:

- Sorting – The number of items to be sorted
- Graphs – The number of vertices and/or edges
- Numerical – The number of bits needed to represent a number

The choice of an input size greatly depends on the *elementary operation*; the most relevant or important operation of an algorithm.

- Comparisons
- Additions
- Multiplications