

## Introduction & Design

- Polya's Problem Solving Process
  - † know the 4 steps in the process
- Algorithm Definition
  - † Know the properties
  - † Be able to distinguish: algorithm  $\Leftrightarrow$  program
- Language Levels
  - † know the 3 levels
- Program Translation
  - † know the steps & process
- Program Design
  - † Be able to compose top-down designs:
    - ‡ **Outlines, Module (Structure) Charts, Pseudocode**
- Program Proofs
  - † Be able to state simple assertions & loop invariants

## C/C++ Fundamentals

- Language Elements
  - † Basic Statements
    - ‡ Be able to code short C programs
    - ‡ Interpret syntax 'railroad' diagrams
    - ‡ declare & initialize variables & constants
    - ‡ Evaluate, trace & execute C code segments
    - ‡ Perform stream (file) I/O
  - † Program Errors
    - ‡ Be able to identify and give examples
- Selection
  - † Boolean Expressions & Conditions
    - ‡ Be able to compose & evaluate
    - ‡ Eliminate short-circuiting
  - † if else
    - ‡ Be able to compose & evaluate
    - ‡ identify dangling elses
  - † switch
    - ‡ Be able to compose & evaluate

### C/C++ Fundamentals (cont)

- Iteration (looping)
  - † while
    - ‡ Be able to compose & evaluate
    - ‡ Be able to identify the different types of loops
      - ‡ count-controlled, event-controlled, eof, end-of-line, flag
  - † for
    - ‡ Be able to compose & evaluate
  - † do { } while
    - ‡ Be able to compose & evaluate
  - † loop control
    - ‡ break & continue
      - ‡ know the affected loop behavior