CS 100
Scientific Computing

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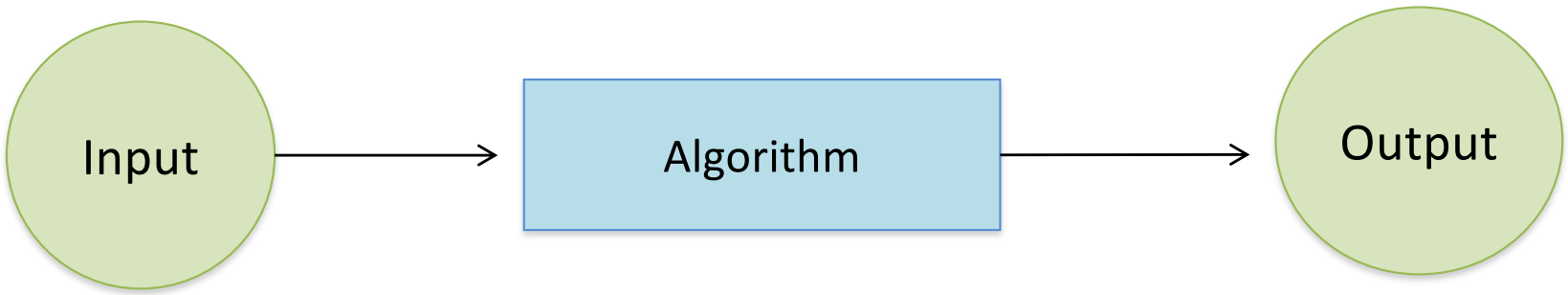
Adapted from a Slide Deck by Dr. Heather Guanera

What is computer science (CS)?

E. Dijkstra: "The term *computer science* is like referring to surgery as *knife science*."

- Computer science is the study of algorithms and how to solve problems.

- An algorithm is a step-by-step procedure for performing some task (think of a recipe from a cookbook) in a finite amount of time.



Where is computer science? Everywhere!

- Information sharing: google, word processors, presentations, image editing
- Social media
- Video games
- Mobile applications (GPS, calls, texting, pictures, etc.)
- Car
- Household appliances (fridge, washer/dryer, TV, home assistant)
- Wrist watch / smart watch
- Traffic light control
- Databases
  - Banking
  - Academic
  - Employment
- Health & Medical devices
  - Pacemakers
  - MRI machines
  - CAT scans
  - Glucose monitoring

How we'll study computer science

- **Write many small to medium sized programs**
- Programs solve a variety of (mainly scientific) problems
  - Plotting functions and data
  - Approximating Pi
  - Encryption
  - Statistics
  - Binary Operations
  - Create simulations to model complex behavior
    - Firefly synchronization
    - Predator-Prey relationships
    - Fractals to generate trees and snowflakes
  - Image manipulation
  - Game development

Administrative info

- Tools
  - Language: Python
  - IDE: (Interactive Development Environment) Thonny
- Teams
- Course Website & Moodle
- Syllabus
- Thonny
  - Interactive Python Interpreter