

# Figure 0.2 The Euclidean algorithm

**Description:** This algorithm assumes that its input consists of two positive integers and proceeds to compute the greatest common divisor of these two values.

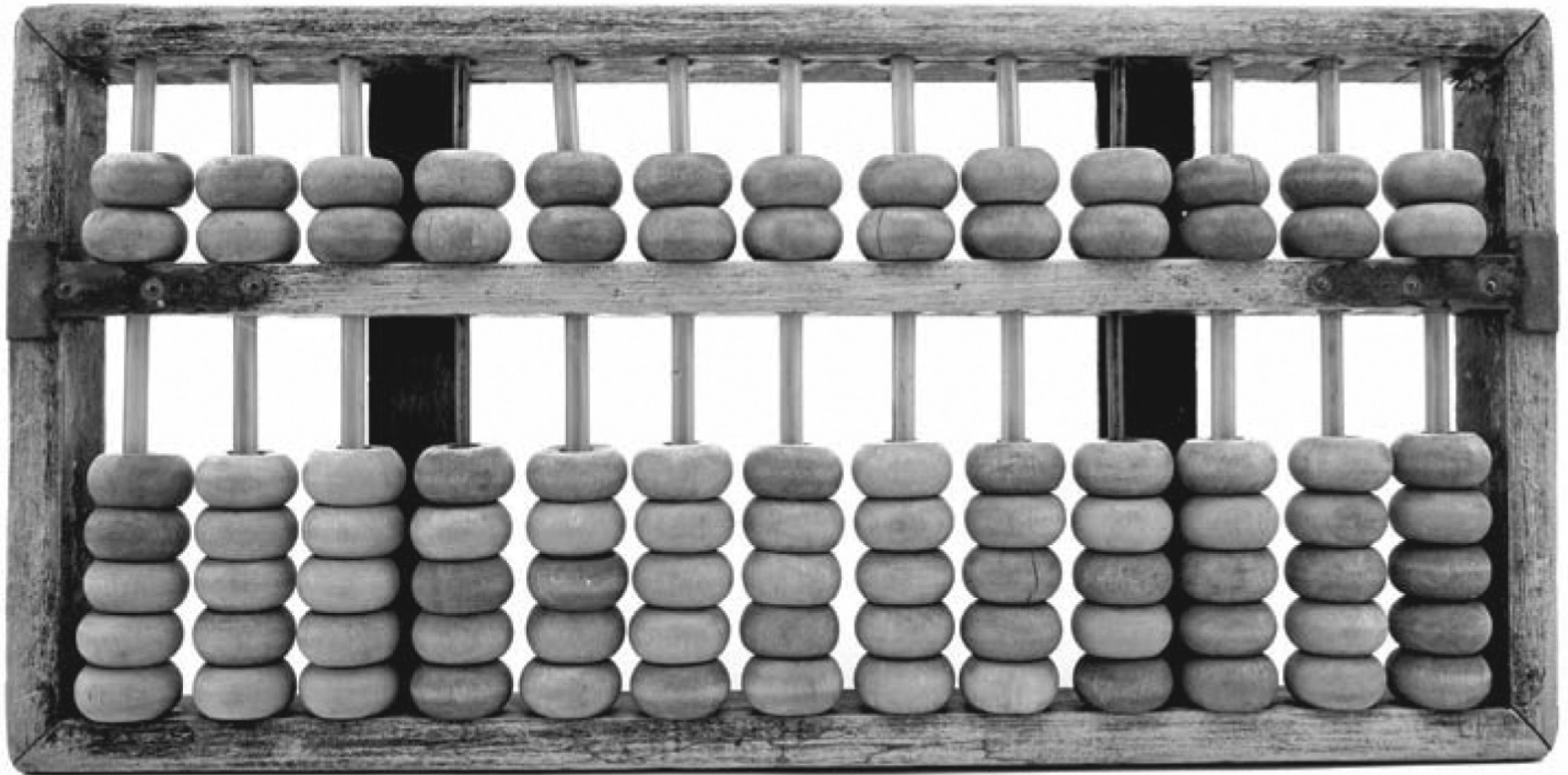
**Procedure:**

- Step 1. Assign M and N the value of the larger and smaller of the two input values, respectively.
- Step 2. Divide M by N, and call the remainder R.
- Step 3. If R is not 0, then assign M the value of N, assign N the value of R, and return to step 2; otherwise, the greatest common divisor is the value currently assigned to N.

# History of Computing

- Early computing devices
  - Abacus: positions of beads represent numbers
  - Gear-based machines (1600s-1800s)
    - Positions of gears represent numbers
    - Blaise Pascal, Wilhelm Leibniz, Charles Babbage

# Figure 0.3 Chinese Wooden Abacus



# Early Data Storage

- Punched cards
  - First used in Jacquard Loom (1801) to store patterns for weaving cloth
  - Storage of programs in Babbage's Analytical Engine
  - Popular through the 1970's
- Gear positions

# Early Computers

- Based on mechanical relays
  - 1940: Stibitz at Bell Laboratories
  - 1944: Mark I: Howard Aiken and IBM at Harvard
- Based on vacuum tubes
  - 1937-1941: Atanasoff-Berry at Iowa State
  - 1940s: Colossus: secret German code-breaker
  - 1940s: ENIAC: Mauchly & Eckert at U. of Penn.

# Figure 0.4 The ENIAC computer



# Personal Computers

- First used by hobbyists
- IBM introduced the PC in 1981.
  - Accepted by business
  - Became the standard hardware design for most desktop computers
  - Most PCs use software from Microsoft

# Into the Millennium

- Internet revolutionized communications
  - World Wide Web
  - Search Engines (Google, Yahoo, and Microsoft)
- Miniaturization of computing machines
  - Embedded (GPS, in automobile engines)
  - Smartphones