

CHAPTER 11

- **Alphabet:** A finite set of the symbols used in a Turing machine.
- **Church–Turing Thesis:** A thesis that states that if there exists an algorithm to do a symbol manipulation task, then there exists a Turing machine to do that task.
- **Computability:** The capability to do something by symbol manipulation algorithms.
- **Halting problem:** A problem that asks you to decide, given any collection of Turing machine instructions together with any initial tape contents, whether a Turing machine will ever halt if started on that tape.
- **Incrementer:** A Turing machine that adds 1 to any number.
- **Model:** A simplified version of something that captures the essence of the real thing, probably differs in scale from the real thing, suppresses some of the details of the real thing, and lacks the full functionality of the real thing.
- **Odd parity bit:** An extra bit attached to the end of a string of bits and set so that the number of 1s in the whole string of bits, including the parity bit, is odd.
- **Proof by contradiction:** An approach to proving that something does not exist, in which we assume that such a thing does exist and then show that this assumption leads to an impossible situation.
- **State diagram:** A visual representation of a Turing machine algorithm, where circles represent states and arrows represent transitions from one state to another.
- **Turing machine program:** A set of Turing machine instructions that allow a Turing machine to carry out a certain task.
- **Turing machine:** A model of a computing agent proposed by the British mathematician Alan Turing in 1936; includes a (conceptual) tape, divided into cells, that extends infinitely in both directions.
- **Unary representation of numbers:** A representation of numbers that uses only one symbol.
- **Uncomputable problem:** A problem that has no algorithmic solution; also called an unsolvable problem.
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