
CHAPTER 1

Introduction

(Solutions to Odd-Numbered Problems)

Review Questions

1. Turing proposed that all kinds of computation could be performed by a special kind of a machine. He based the model on the actions that people perform when involved in computation. He abstracted these actions into a model for a computational machine that has really changed the world.
3. Based on the Turing model a program is a set of instruction that tells the computer what to do.
5. The subsystems of the von Neumann model are memory, the arithmetic/logic unit (ALU), the control unit, and the input/output.
7. The arithmetic/logic unit (ALU) is where calculations and logical operations take place.
9. The input subsystem accepts input data and the program from outside the computer; the output subsystem sends the result of the processing to the outside.

Multiple-Choice Questions

11. b 13. a 15. d 17. d 19. a 21. a
23. d 25. c

Exercises

27. According to Turing, any problem that can be solved by a big computer can also be solve by a small computer but a big computer can solve the problem faster.
29. In the Turing model, a computer consists of input data, output data and a program. Leibnit's wheel is not a computer according to this model because it lacks the program component.
31. The Analytical Engine has all four components of the von Neumann model: a mill (ALU), a store (memory), an operator (control unit), and output (input/output), but

the program was not stored in the memory. Therefore, it is not a computer according to the von Neumann model.

33. The first keyboard appear with time sharing, multi-user system by 1964 which is end of the second generation and the beginning of the third generation.
35. The hard disk of today may be used as either an input device or an output device. When data or programs are read from the disk, the disk is considered an input device. When data or programs are written to the disk, the disk is considered an output device.
37. Data are the most valuable assets of most organizations. An organization can replace its hardware and software if they are lost (due to theft, fire, etc.) and usually they do it every few years as hardware or software become obsolete, but the data are indispensable.