

Unit 1 Homework

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2020 年 10 月 4 日

1. The computer model based on the von Neumann architecture consists of a CPU(including ALU and CU), a memory, input and output(sometimes external storage involved). Both data and programs are stored in memory using binary patterns, which can help programs run more efficiently.
2. Program based on the von Neumann model contains a finite number of instructions that are executed sequentially, and has the role of executing a sequence of commands, controlling hardware of the computer to finish calculating tasks, using input and data to produce output.
3. B
4. C
5. A
6. D
7. C
8. No. Because in the von Neumann model, hard disk belongs to the external storage rather than input or output. (But actually files in hard disk can be input and output)
9. Lightweight microcomputer and high performance computer.
10. Supercomputer is a kind of high performance computer that performs calculation at the highest operational rate. The supercomputer is Sunway TaihuLight from China.

11. According to the NIST, cloud computing is a model of enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources. The characteristics of cloud computing include virtualized resources, elasticity, scalability, flexibility of services, on-demand delivery of resources, efficiency, parallel processing, cost saving, etc.
12. The characteristics of big data are called 4Vs, namely, volume, variety, velocity and value.
13. IoT, Internet of Things, is a network of items, each embedded with sensors connected to the Internet.
14. The major fields of computer science are various, including:
 - Mathematical foundations.
 - Theory of computation.
 - Algorithms and data structures.
 - System architecture.
 - Concurrent, parallel, and distributed systems.
 - Programming languages and compilers.
 - Software engineering.
 - Databases.
 - Artificial intelligence.
 - Computer graphics.
 - Human computer interaction.
 - Telecommunication and networking.
 - Scientific computing.