Chapter 1 Hardware
Unit 1.2 Computer Architecture
备课时间：2019-09-05

词汇与词组

1. **Architecture 建筑学，建筑艺术；建筑(样式、风格)；建筑物；构造，结构**

   ➤ 词根词缀:-arch-统治 + -i- + tect(-techn-)技术 + -ure 名词词尾

2. **Series[ˈsɪəriːz]：系列，单复数同形**

   ➤ A series of: 一系列，后+复数名词

3. **Assembler [əˈsemblə(r)]：汇编程序，汇编器**

   ➤ a computer program that automatically converts instructions written in assembly language into machine language

4. **Kernel /ˈkɜːn(ə)l/ 操作系统内核**

   ➤ kern-,核，谷物，词源同 corn,-el,小词后缀。引申词义果仁,核，核心。

   ➤ The kernel is the central module of an operating system (OS). It is the part of the operating system that loads first, and it remains in main memory.

   ➤ Because it stays in memory, it is important for the kernel to be as small as possible while still providing all the essential services required by other parts of the operating system and

applications.

➢ The kernel code is usually loaded into a protected area of memory to prevent it from being overwritten by programs or other parts of the operating system.

➢ Typically, the kernel is responsible for memory management, process and task management, and disk management.

➢ The kernel connects the system hardware to the application software.

➢ Every operating system has a kernel. For example the Linux kernel is used numerous operating systems including Linux, FreeBSD, Android and others.

5. Perform /pə'fɔːm/: 运行，执行，表现

➢ Each object contains both the data and processing operations necessary to **perform** a task.

➢ Computer program consisting of step-by-step instructions, directing the computer on each task it will **perform**.

➢ These programs can **perform** a variety of tasks, from providing easy access to your cloud services to making it easier to capture information on a web page.

➢ The arithmetic-logic unit, usually called the ALU, **performs** two types of operations: arithmetic and logical.

6. Category：类别

➢ Every computer system has **two basic categories** of buses. **One category**, called system buses, connects the CPU to memory on the system board. **The other category**, called expansion buses, connects the CPU to other components on the system board, including expansion slots.

➢ Subcategory：子类别

前缀 sub 含义

①"在…下面", "在…下方", "后面"等；

subway(地铁)

②"轻微地", "不完整", "近乎"等。

suberect(几乎直立的)

③"次要的", "次要的", "附属的"

subordinate(下级的，辅助的)

➢ Subsequent：happening or coming after sth else 随后的；后来的；之后的；接后的

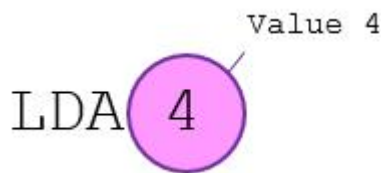①These skills were passed on to **subsequent** generations.

这些技能代代相传。

②The explosion of the Internet and **subsequent** globalization of computing have led to a new character encoding called Unicode, which uses 16 bits.

7. Memory address mode：

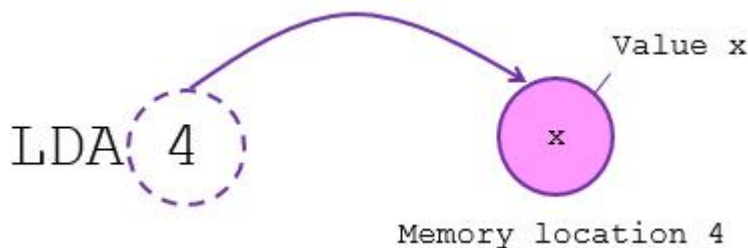➤ Memory address modes determine the method used within the program to access data either from the Cache or the RAM.

① **Immediate Addressing 立即数**

    a) means that the data to be used is hard-coded into the instruction itself.

Value 4

LDA 4

    b) This is the fastest method of addressing as it does not involve fetching anything from the main memory at all.
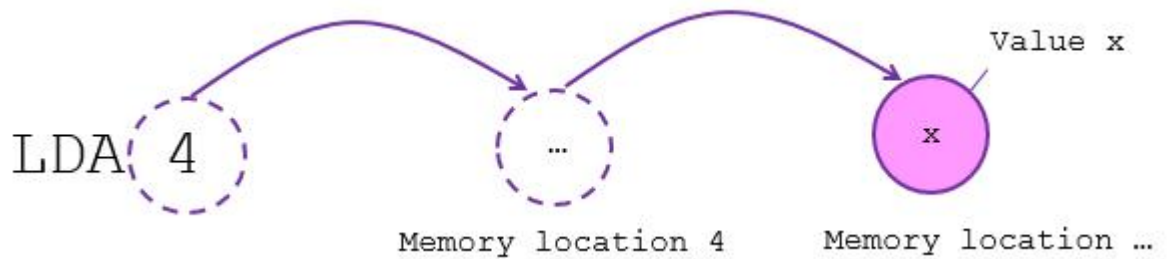
② **Direct Addressing(直接地址)** is a very simple way of addressing memory – it means that the operand of an instruction refers directly to a location in memory.
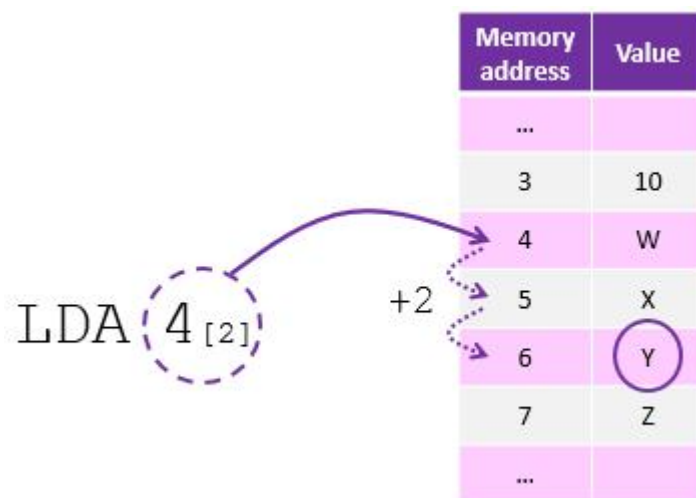

Value x

LDA 4   x

Memory location 4

③ **Indirect Addressing(间接地址)**

    a) means that the address of the data is held in an intermediate location so that the address is first 'looked up' and then used to locate the data itself.

b) Indirect addressing mode is a two steps process: the operand is an address towards a memory location that contains an address where the value can be fetched from.

④ **Indexed(索引/变址) Addressing** means that the final address for the data is determined by adding an offset to a base address.

8. Computer organization 计算机组成

9. Cache

➤ The **Cache Memory** (Pronounced as "cash") is the volatile computer memory which is very nearest to the CPU so also called CPU memory, all the Recent Instructions are Stored into the Cache Memory.

➤ It is the fastest memory that provides high-speed data access to a computer microprocessor.

10.   Off-load：卸载

Direct Memory Access (DMA) 直接内存存取

➤ is a method of transferring data from the computer's RAM to another part of the computer without processing it using the CPU.

➤ While most data that is input or output from your computer is processed by the CPU, some data does not require processing, or can be processed by another device.

11.   **Multi-processing：**   the running of two or more programs or sequences of instructions simultaneously by a computer with more than one central processor.

12. Speed critical：速度攸关的，对速度要求高的

> Safety critical：安全攸关的

Safety-critical systems are those systems whose failure could result in loss of life, significant property damage, or damage to the environment.

13. Floor-plan: 平面布置图

14. Trade off（动词短语：权衡）

➤ Economic policy is about **trading off** costs against benefits.
经济政策是以成本与效益相权衡.

➤ **Trade-off(名词：权衡，取舍):** a situation in which you must choose between or balance two things that are opposite or cannot be had at the same time.
Life is full of trade-offs. You cannot have your cake and eat it too. 生活充满了取舍。鱼与熊掌不可兼得。

15. Throughput：吞吐量

the amount of something (such as material, data, etc.) that passes through something (such as a machine or system)

16. consumption: 消费，消耗

con 共同+sumpt 拿,取+ion 表名词→全拿完→消耗

17. **scheme：方案，计划**

18. **MHz: megahertz，1 million cycles per second**

19. **GHz: gigahertz，1 thousand million cycles per second**

20. **refer to：指的是，参考**
    - I **was referring to** Paris, Texas, not Paris, France.
    - The first pie chart **refers to** the company's various expenditures（支出），while the second **refers to** our sources of revenue（收入）.
    - Please **refer to** your employee handbook if you have any questions about these policies.

21. **Machinery：机械装置**
    - agricultural/industrial machinery 农业／工业机械

22. **Anti-lock Breaking System**
    - 防抱死制动系统，俗称 ABS。
    - 用于保持车辆在制动情况下仍具可控能力的装置。
    - 在车辆制动时，由电控单元来调节驾驶者的刹车力度，防止车轮被抱死

23. **CPU bound 计算密集型**
    - In computer science, a computer is CPU-bound (or compute-bound) when the time for it to complete a task is determined principally by the speed of the central processor: processor utilization is high, perhaps at 100% usage for many seconds or minutes. Interrupts generated by peripherals may be processed slowly, or indefinitely delayed.

24. **Power consumption 功耗，能耗，耗电量**

25. **Power efficiency 能效**

26. **Power density 功率密度**

27. **Criteria [kraɪ'tɪərɪə]**

   ➢ A criterion is a factor on which you judge or decide something. (判断的) 标准

   ➢ Factor

   ①one of several things that cause or influence sth 因素；要素

   ②to include or admit as a factor —used with in or into

28. **trade for：换取**