

Chapter 1 Hardware

Unit 1.3 Microprocessor

备课时间：2019-09-14

词汇与词组

1. The circuitry in a typical computer that performs **operations** (such as addition and subtraction) on data is not directly connected to the storage cells in the machine's **main memory**.

➤ **Operation:**运算

➤ **Main memory:**主存储器

2. General-purpose registers **serve as** temporary holding places for data being manipulated by the microprocessor.

➤ **serve as:**用作，充当

3. **It is** the control unit's **responsibility to** transfer the data from memory into the general-purpose registers, **to** inform..., **to** activate..., **and to** tell....

➤ **It is ... responsibility to ...:** 这是...的责任/任务

➤ **It is your responsibility to** present clean and accurate information.

➤ **It is our responsibility to** act now.

4. **It is instructive to** consider registers in the context of a machine's overall memory **facilities**.

➤ **It is instructive to...:** 这对 ... 是有益的

➤ **It is instructive to** physical experiment teaching.

➤ **Facility:** 设备、设施、工具；附加功能

One of the new models has the **facility** to reproduce speech as well as text.

新款型中的一款有重现言语和文本的附加功能。

5. In many machines, an additional level, called **cache** memory, is added to this **hierarchy**.

➤ **Cache:** 缓存

➤ **Hierarchy:** 层次结构（见图）

6. **For the purpose of** transferring **bit patterns** between a machine's microprocessor and main memory, those units are connected by a collection of wires called a bus.

➤ **For the purpose of:** 为了...目的

➤ A **bit** can be 0 or 1. With one bit there are two possible patterns.

➤ How many patterns can be formed with two bits?

0 0
0 1
1 0
1 1

Looks like 4 patterns.

Number of possible patterns of N bits = 2^N

7. Pertinent /'pɜː tɪnənt/ : 相关的

- **Pertinent memory cell:** 相关存储单元
- **Relevant:** 相关的; 相关性

Do you have the **relevant experience**?

你有相关的经历吗?

By web **relevant mining**, we can contact the source web to its similar webs and find useful knowledge ultimately.

通过网页文本的相关性挖掘, 可以将网页文本集合中相似的文本联系起来, 便于从中发现有用的知识。

8. The complete process of adding two values stored in memory might be broken down into the five steps **listed in Figure 1.6.**

- **List:** 列出, 列入
- **Present:** 呈现出来, 展示

We spend the time collating and **presenting** the information in a variety of chart forms.

我们把时间花在以各种图表形式比照和展示信息上。

➤ **Illustrate:** 表明、显示、阐明

Let me give another example to **illustrate** this difficult point.
让我举另一个例子来阐明这个难点。

9. Activate the addition circuitry with the registers used in Step 1 and 2 as inputs and another register **designated to** hold the result.

➤ **designated bank:** 指定银行

➤ **designated location:** 指定位置

Some of the rooms were **designated as** offices.
其中一些房间是被指定用作办公室的。

10. The steps in Figure 1.6 **provide** examples of the types of instructions a typical microprocessor must be able to follow.

➤ **Provide:** 提供

They would not **provide** any details.
他们不肯提供任何细节。

provide service: 提供服务

➤ **Provide:** 规定

The treaty **provides** that, by the end of the century, the United States must have removed its bases.

这项条约规定，到本世纪末，美国必须撤走其基地。

➤ **Follow:** 接受，遵循，听从（忠告、指示等）

Take care to **follow** the instructions carefully.

注意严格遵循说明。

to **follow** a diet/recipe

按照规定饮食；采用规定食谱

Why didn't you **follow** my advice ?

你为什么不听我的劝告？

11. **In other words**, beyond a certain point, additional features may ...

➤ **In other words**: 换言之

➤ **put another way, that is, that is to say**

例句:

Put another way, socializing over the internet fosters shallow relationships.

换言之，互联网社交培养的是肤浅的友谊。

12. When discussing the instructions in a machine's **repertoire**, it is helpful to recognize that they can **be classified into** three categories.

➤ **Repertoire** /'repətwa: /: 计算机指令表/系统；全部节目/本领

➤ **Repertory**: 仓库；指令系统/表；库存；储备；

Machine instructions used in 8086 microprocessor

1. **Data transfer** instructions– move, load exchange, input, output.

- **MOV** :Move byte or word to register or memory .
- **IN, OUT**: Input byte or word from port, output word to port.
- **LEA**: Load effective address
- **LDS, LES** Load pointer using data segment, extra segment .
- **PUSH, POP**: Push word onto stack, pop word off stack.
- **XCHG**: Exchange byte or word.
- **XLAT**: Translate byte using look-up table.

2. **Arithmetic** instructions – add, subtract, increment, decrement, convert byte/word and compare.

- **ADD, SUB**: Add, subtract byte or word
- **ADC, SBB** :Add, subtract byte or word and carry (borrow).
- **INC, DEC**: Increment, decrement byte or word.
- **NEG**: Negate byte or word (two's complement).
- **CMP**: Compare byte or word (subtract without storing).
- **MUL, DIV**: Multiply, divide byte or word (unsigned).
- **IMUL, IDIV**: Integer multiply, divide byte or word (signed)
- **CBW, CWD**: Convert byte to word, word to double word
- **AAA, AAS, AAM, AAD**: ASCII adjust for add, sub, mul, div .
- **DAA, DAS**: Decimal adjust for addition, subtraction (BCD)

numbers)

3. **Logic** instructions – AND, OR, exclusive OR, shift/rotate and test

- **NOT** : Logical NOT of byte or word (one's complement)
- **AND**: Logical AND of byte or word
- **OR**: Logical OR of byte or word.
- **XOR**: Logical exclusive-OR of byte or word
- **TEST**: Test byte or word (AND without storing).
- **SHL, SHR**: Logical Shift rotate instruction shift left, right byte or word? by 1 or CL
- **SAL, SAR**: Arithmetic shift left, right byte or word? by 1 or CL
- **ROL, ROR**: Rotate left, right byte or word? by 1 or CL .
- **RCL, RCR**: Rotate left, right through carry byte or word? by 1 or CL.

4. **String manipulation** instruction – load, store, move, compare and scan for byte/word

- **MOVS**: Move byte or word string
- **MOVSB, MOVSW**: Move byte, word string.
- **CMPS**: Compare byte or word string.
- **SCAS** S: scan byte or word string (comparing to A or AX)
- **LODS, STOS**: Load, store byte or word string to AL.

5. **Control transfer** instructions – conditional, unconditional, call subroutine and return from subroutine.

- **JMP**: Unconditional jump. it includes loop transfer and subroutine and interrupt instructions.
- **JNZ**: jump till the counter value decreases to zero. It runs the loop till the value stored in CX becomes zero

6. **Loop control** instructions-

- **LOOP**: Loop unconditional, count in CX, short jump to target address.
- **LOOPE (LOOPZ)**: Loop if equal (zero), count in CX, short jump to target address.
- **LOOPNE (LOOPNZ)**: Loop if not equal (not zero), count in CX, short jump to target address.
- **JCXZ**: Jump if CX equals zero (used to skip code in loop).
- **Subroutine and Interrupt instructions-**
- **CALL, RET**: Call, return from procedure (inside or outside current segment).
- **INT, INTO**: Software interrupt, interrupt if overflow. **IRET**: Return from interrupt.

7. **Processor control** instructions-

Flag manipulation:

- **STC, CLC, CMC**: Set, clear, complement carry flag.

- **STD, CLD**: Set, clear direction flag.
- **STI, CLI**: Set, clear interrupt enable flag.
- **PUSHF, POPF**: Push flags onto stack, pop flags off stack.

13. Steps 1, 2 and 4 in Figure 1.6 **fall into** this category.

➤ **fall into: be included in or classified as; 落入, 陷入, 陷于, 河流注入**

Some carbs **fall into** the "starch" and "simple sugar" category.

一些碳水化合物落入（归入）“淀粉”和“单糖”一类。

She **fell into** the swimming pool.

她掉进了游泳池。

14. The process **involved in** a transfer instruction is more like copying the data into another location **rather than** moving it.

➤ **Involved in:** 卷入, 涉及, 牵涉进, 参与

Repeat this step for each agent involved in collecting the data.

对涉及收集数据的每个代理重复这个步骤。

➤ **Rather than:** 而不是

15. In this sense, the popular transfer or move **terminology** is actually a **misnomer**.

➤ **Misnomer:** 误称, 用词不当

Herbal "tea" is something of a **misnomer** because these drinks contain no tea at all.

花草“茶”是个误称, 因为这类饮料里根本不含茶。

➤ **Terminology:** The terminology of a subject is the set of **special words** and **expressions** used in connection with it.

术语

➤ **-logy**

● **Anthropology** /,æθrə'pɒlədʒɪ/: 人类学

● **Anthropologist** /,æθrə'pɒlədʒɪst/: 人类学家

● **Biology** /baɪ'ɒlədʒɪ/: 生物学

● **Biologist** /baɪ'ɒlədʒɪst/ : 生物学家

● **Geology** /dʒɪ'ɒlədʒɪ/ : 地质学

- **Ethnology** /eθ'nɒlədʒɪ/ : 民族学，人种学；人类文化学
- **Lithology** /lɪ'θɒlədʒɪ/ : 岩石学
- **Anesthesiology** /,ænəs,θɪzɪ'ælədʒi/ : 麻醉学

16. **Clone**: (动植物的) 克隆；复制

- **Shallow clone** is “default implementation” in Java. In overridden (重写) clone method, if you are not cloning all the object types (not primitives), then you are making a shallow copy.
- **Deep clone** is the desired behavior in most the cases. In the deep copy, we create a clone which is independent of original object and making changes in the cloned object should not affect original object.

17. **As its name suggests**, the arithmetic/logic unit is capable of performing operations other than the basic arithmetic operation.

- **As its name suggests**: 顾名思义

SimpleXML, as its name suggests, was created to provide a very simple interface to accessing XML.

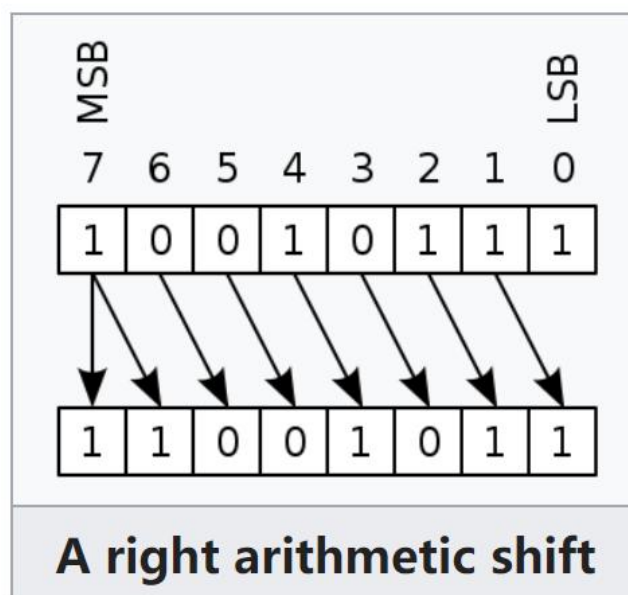
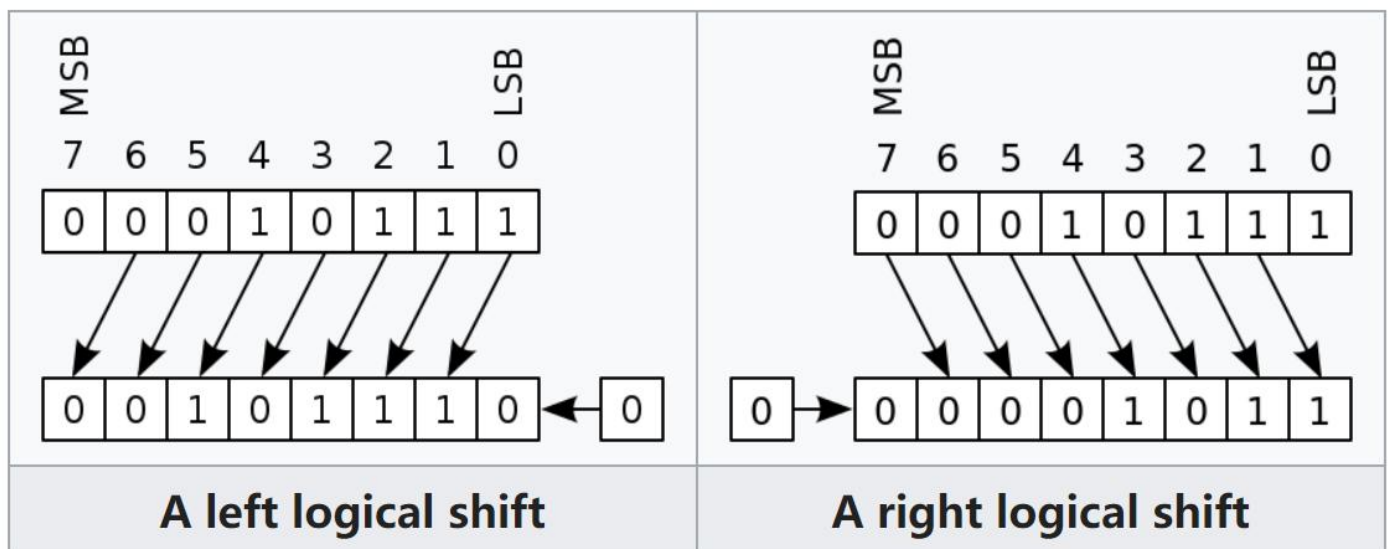
顾名思义，SimpleXML 旨在提供一个非常简单的接口来访问 XML。

➤ is capable of: 有能力...

The best teacher in the world is Yourself. Each normal person is **capable of** learning all the subjects taught in school. All they need is motivation.

世界上最好的老师是你自己。每一个正常的人都有能力把学校里所有的科目学好，他们唯一需要的只是动力。

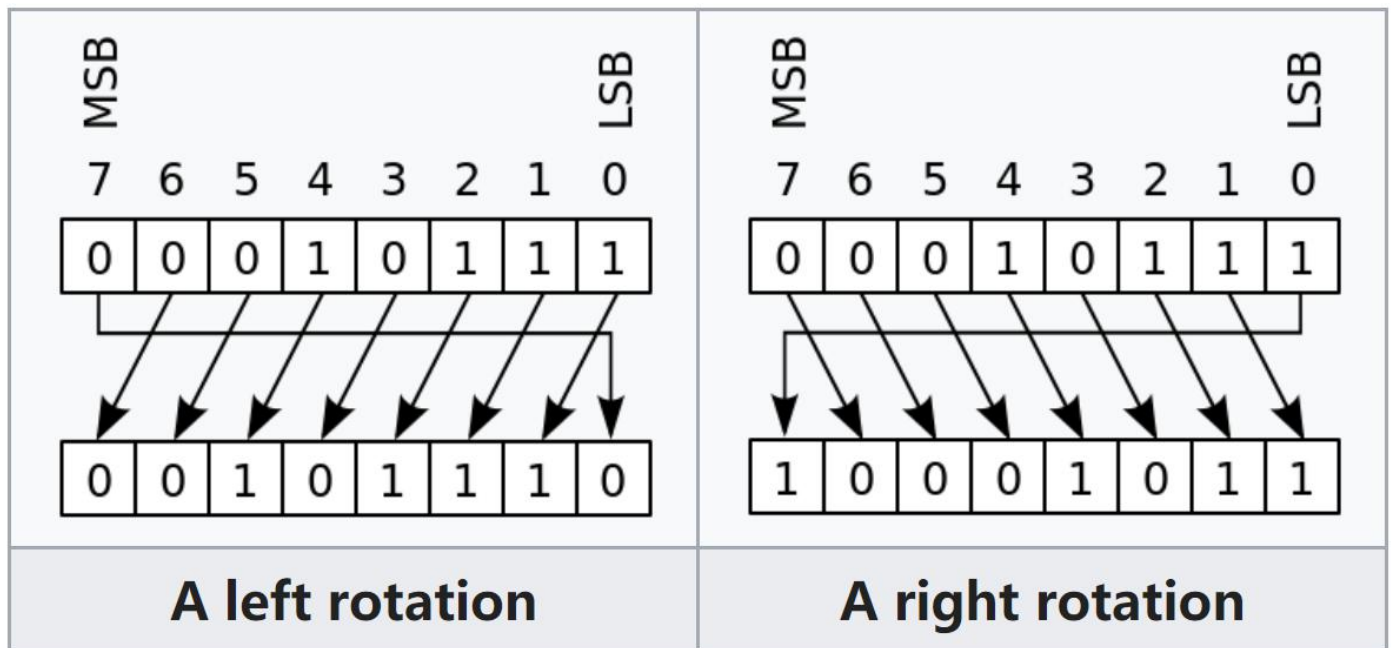
18. SHIFT



MSB: Most Significant Bit

LSB: Least Significant Bit

19. ROTATE



A **rotation** is like a shift, except the bit shifted off the end of the register is then shifted into the new spot.

20. Venue['venju:] : 犯罪地点, 案发地点; 会场; (尤指) 体育比赛场所; 审判地
- Change of venue: 控制变更