

讲座 1

整个课程在线: <https://learn.bcit.ca/d2l/home/742403>

杰森把东西放在内容部分下

每节课测验: 活动-> 测验基于上周

作业有时: 活动-> 作业

录制的讲座: 活动-> 虚拟课堂

Jason_Harrison@bcit.ca

如何在这门课程中表现良好:

专注于数学和图表

提前阅读

不要落后

提问, 尤其是在课堂上

典型课程: 问答、课程、测验

Official grades are at my.bcit.ca

课程大纲: <https://www.bcit.ca/outlines/20212057039>

专注于教科书中的这些图表:

第一章: 页数 5, 18, 50*

第二章: 57, 66, 75*, 82

第三章: 161*, 164, 165, 167, 173, 176, 193, 195

第四章: 245, 292, 307**

第五章: 366

期末考试只涵盖期中考试后的内容。

快速计算机: 多个核心, 快速时钟速度的 CPU, 快速频率的 RAM 主板, 具有大量线程, 高总线速度.

您的计算机是许多妥协的结果: 我们想要简单、便宜, 向后兼容。

约翰·冯·诺依曼。与伙伴合作, 然后回来告诉我关于 JvN 的事。

定义:

比特 0 或 1 1b = 1 比特

字节 8 位字 1B = 1 字节

字 可能是 64 位大小; 这取决于寄存器的大小

注册 CPU 内存: 根据定义, 它存储一个字 (这个字可以是一个地址、一个指令、指令的操作数等...)

32 位与 64 位: $2^{64} = 2^{32} * 2^{32}$

1000000 比 1000 大多少倍? 1000

中央处理器 中央处理单元: FDE 周期: 获取、解码和执行指令

内存 主内存即 RAM

总线在设备之间传输数据的常见电气通路

$2^7 = 128$

$2^3 = 8$

$2^{10} = 1024$ 也称为 1k

$2^{17} = 2^7 * 2^{10} = 128k$

$2^{20} = 1$ 兆

$2^{30} = 1G$

$2^{40} = 1T$

$2^{32} = 2^2 * 2^{30} = 4G$

$2^{15} = 32k$

$2^{29} = 512M$

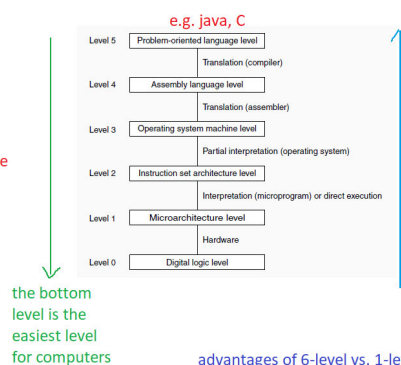
在我们的测验和考试中这样回答

page 5

six levels and five interfaces =
11 interesting things (most of
which are software)

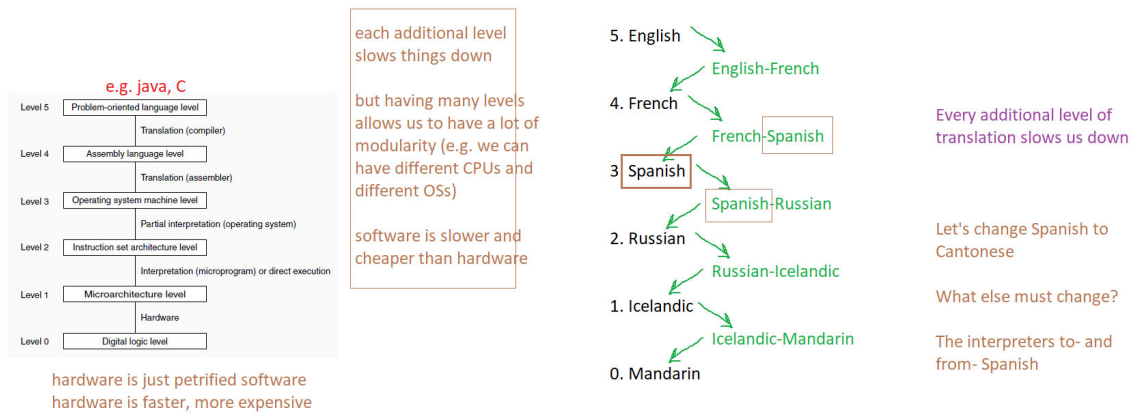
Example: we write a C program and compile
it. The computer's software and hardware
rewrite this program into five more
languages (levels 4, 3, 2, 1, 0).

The "bottom" program is the one that is
physically run by hardware.



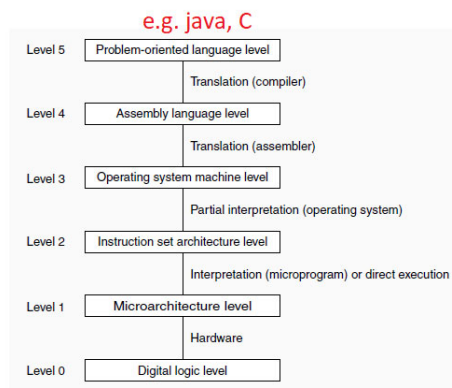
The output when converting a level-x
program is the EQUIVALENT program
written in a language at level x-1. This new
program has more instructions in it, each of
which is simpler, but eventually that
program does the same thing as the one
above it.

advantages of 6-level vs. 1-level computer: cheaper, modular



例如，软件与硬件：

棋盘 DVD 与棋盘卡



QUESTION:
what would level 6 look like?

ANSWER:
UML is level 6
When you "compile" it, its output is a level-5 program (e.g. java classes)

QUESTION:
what would level 7 look like?

ANSWER:
even easier for people
even harder for computers
even slower than levels 6, 7
when compiled, its output is a level-6 program

定义：

翻译：即编译 将一个 完整的高级语言程序转换为
一次性编写等效的低级语言程序。例如，编写一个
C 语言中的视频游戏，编译它，可以丢弃源代码
并运行/保持可执行文件。编译很慢；运行 可执行文件很快。

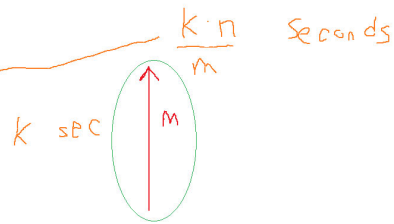
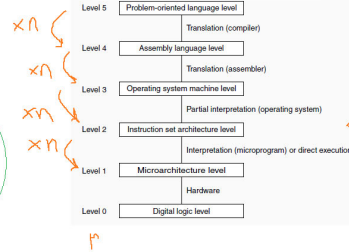
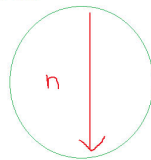
解释：将高级语言程序中的一条指令 转换为等效的低级语言指令，并 立即执行；然后重复
处理下一条指令，例如 JavaScript 程序。

第 52 页：问题 4

Consider a multilevel computer in which all the levels are different. Each level has instructions that are m times as powerful as those of the level below it; that is, one level r instruction can do the work of m level $r - 1$ instructions. If a level-1 program requires k seconds to run, how long would equivalent programs take at levels 2, 3, and 4, assuming n level r instructions are required to interpret a single $r + 1$ instruction?

the more powerful instructions
are at the TOP

the more numerous instructions
are at the BOTTOM



more instructions = more time

more power = fewer instructions = less time

as n increases, the time increases, which makes sense

as m increases, we need fewer of those powerful instructions, so the time decreases, which makes sense

level 4: kn^3/m^3

level 3: takes n instructions even more to interpret, but m times as few because they're more powerful: kn^2/m^2 seconds

level 2: takes k seconds times n instructions divided by m instructions (e.g. if $m = 5$ that's like saying a pitbull is 5 times more powerful than a chihuahua therefore you only need 1/5th as many pitbulls): kn/m seconds

level 1: takes k seconds

2