SCHOOL OF SOFTWARE, TSINGHUA UNIVERSITY

Architecture of Computer and Network (2)

homework 1

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I. Problem 1

Transform the following signed binary integer into decimal integer.
1)10000000; 2)11001100; 3)10110111

1. for the MSB is 1, it is a negative integer. The true form of it is 10000000. Thus, the decimal integer is -128

2. The true form of 11001100 is 110100. So, the decimal integer is -52.

3. The true form of 10110111 is 1001001. So, the decimal integer is -73.

II. Problem 2

Transform the following signed decimal integer into hexadecimal integer(16bits).
1) -32 2) -62

1. FFE0

2. FFC3

III. Problem 3

what are the main steps of instruction execution cycle?

1. Fetch
2. Decode
3. Fetch operands
4. Execute
5. Store output

IV. Problem 4

what are the range of memory address in real-address mode?
1M, 0x00000 ~ 0xfffff

Problem 5

Convert 0950:0100 to a linear in real-address mode
0950+0100 = 0A50

V. Problem 6

List the 4 parts of the Assembly Language instructions

- Label (optional)
- Mnemonic (required)
- Operand (depends on the instruction)
- Comment (optional)

VI. Problem 7

Declare a 16 bit unsigned integer variable named 'wAarry' with 3 initial value.
wAarry WORD 1, 2, 3

VII. Problem 8

Use equality sign directive to declare a constant sign, which equals 08h.
BACK = 08h

VIII. Problem 9

What are the three types of operand?
immediate, register, memory

IX. Problem 10

Use assembly language to implement AX=(-val2+BX)-val4
mov ax, -val2
add ax, bx
add ax, -val4

X. Problem 11

what is the property of returned value of SIZEOF operator?
The product of the returned value of LENGTHOF and the returned value of SIZE.

XI. Problem 12

Which 32 bit general register can be used as indirect operand?
EAX, EBX, ECX, EDX, ESI, EDI, EBP, ESP

XII. Problem 13

In real-address mode, which register is regarded as counter by LOOP operator?
CX register

XIII. Problem 14

What is little endian order?
Little endian order refers to the way Intel stores integers in memory. Multi-byte integers are stored in reverse order, with the least significant byte stored at the lowest address.

XIV. Problem 15

Does INC instruction affect CF?
No, it doesn't.