

Homework of Chapter 1,2

1.13

Both computers are capable of solving the same problems. Apparently we need only to discuss subtract instruction. Computer B can perform subtraction by taking the negative of the second number and adding it to the first one. Because A and B are identical for other instructions, they are capable of solving the same problems.

1.15

Advantage: A high level programming language is easy to read and understood.

Disadvantage: As for the hardware that goes underlying, a high level language has less control over it.

1.16

Operand, data types, addressing modes.

1.17

The ISA is the complete interface between the program and the hardware, and it describes operand, data types, and addressing modes for example. And microarchitecture specifies the actual physical implementations.

Taking the automobile for an analogy, the ISA is what the driver sees, and the microarchitecture is what goes underlying.

1.18

One microarchitecture typically implements only one ISA. But at the same time, many microarchitectures exist for the same ISA.

2.8

(a) 127 in decimal, 01111111 in binary.

(b) -128 in decimal, 10000000 in binary.

(c) $(2^{n-1})-1$

(d) $-(2^{n-1})$

2.10

(a) -6

(b) 90

(c) -2

(d) 14803

2.11

(a) 01100110

(b) 01000000

(c) 00100001

(d) 10000000

(e) 01111111

2.29

X	Y	X AND Y
0	0	0
0	1	0
1	0	0
1	1	1

2.30

(a) 01010111

(b) 100

(c) 10100000

(d) 00010100

(e) 0000

(f) 0000

2.33

(a) 11010111

(b) 111

(c) 11110100

(d) 10111111

(e) 1101

(f) 1101

2.34

(a) 0111

(b) 0111

(c) 1101

(d) 0110

2.53

A	B	Q1	Q2
0	0	1	0

0	1	1	1
1	0	1	1
1	1	0	1

2.54

X	Y	Z	Q1	Q2
0	0	0	0	1
0	0	1	0	1
0	1	0	0	1
0	1	1	0	1
1	0	0	1	1
1	0	1	1	1
1	1	0	1	1
1	1	1	0	0