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第三章

3.

w		func1(w)		func2(w)	
机器数	值	机器数	值	机器数	值
00…0 01111111	127	00…0 01111111	127	00…0 01111111	127
00…0 10000000	128	00…0 10000000	128	11…1 10000000	-128
00…0 11111111	255	00…0 11111111	255	11…1 11111111	-1
00…01 00000000	256	00…0	0	00…0	0

func1：将机器数的前24位赋为0

func2：将机器数的前24位变为与第25位相同的数字

4.

模式	x 机器数	x 值	y 机器数	y 值	x*y(截断前) 机器数	x*y(截断前) 值	x*y(截断后) 机器数	x*y(截断后) 值
无符号整数	110	6	010	2	001100	12	100	4
带符号整数	110	-2	010	2	111100	-4	100	-4
无符号整数	001	1	111	7	000111	7	111	7
带符号整数	001	1	111	-1	111111	-1	111	-1
无符号整数	111	7	111	7	110001	49	001	1
带符号整数	111	-1	111	-1	000001	1	001	1

5. 对于 x*M，其等价于 -x<<=4-x

$x \times 4 = x \times 2^4 = 16x$

故 $x*M = 15x$

$M = 15$

对于 y1N 若不考虑 if 语句，

易知 N=4

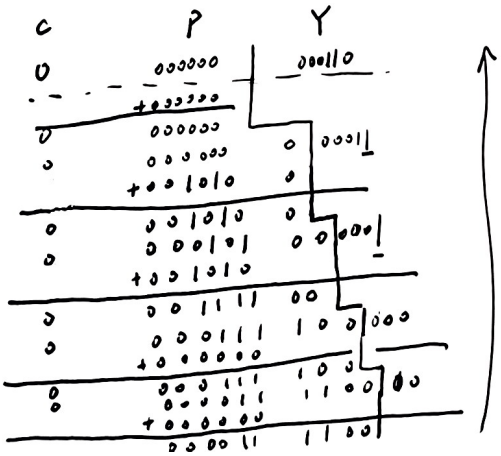
而此处的 if 语句 则是对 1111…1(B[P-1]) 的符号处理

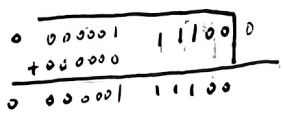
-1/4=0 但右移得到的结果却为 1111…1=-1

7. (1)：解：$[x]_{补}$ 001010 $[y]_{补}$ 111010 $[-y]_{补}$ = 000110

$[x+y]_{补}$ = 000100 = 4 $[x-y]_{补}$ = 010000 = 16

(2)：$[x]_{原}$ = 001010 $[y]_{原}$ = 100110 $-[y]_{原}$ = 000110



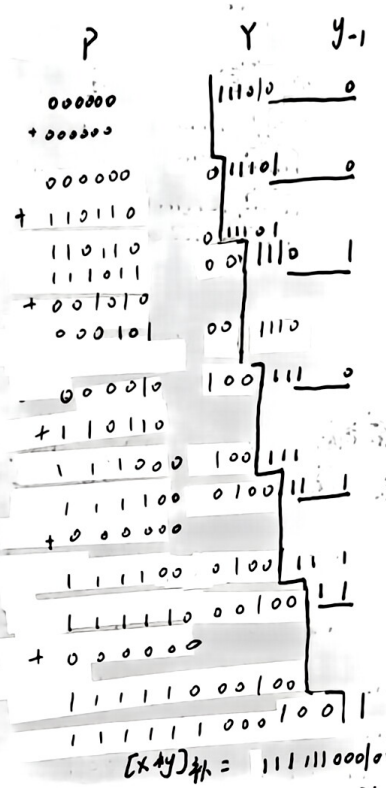


000 00 111100

故 $[x*y]_{原}$ = 100000 111100 = -60

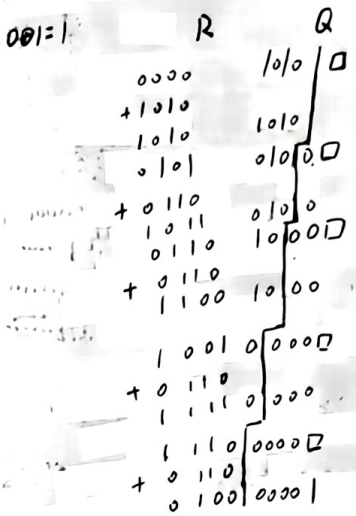
(3): $[x]_{补} = 00.10$ $[y]_{补} = 11.10$

$[-x]_{补} = 11.110$



$[x \times y]_{补} = 111.111000.00 = -60$

(4): $[x]_{补} = 00.10$ $[y]_{补} = 11.010$

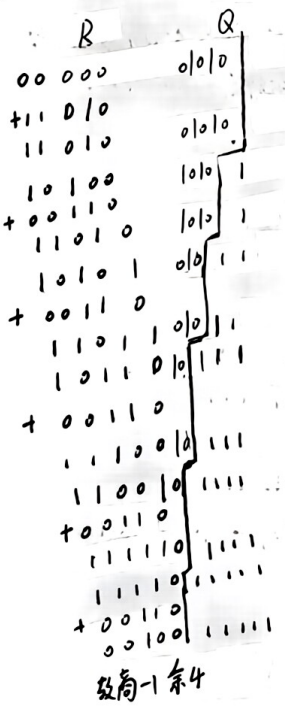


符号位为1 故商 10000 余数为 000.00

(5): $[x]_{补} = 00.10$ $[y]_{补} = 11.010$ $[-y]_{补} = 00.110$

观察得5位即可

$[x]_{补} = 0000\ 0.10$



故商-1余4

11.

$(15/16)\times 2^7 = x = \frac{15}{8}\times 2^6 = 1.111000\times 2^{14-8} = 00\ 1110\ 111000$

$(2/16)\times 2^5 = y = 1\times 2^2 = 1.000000\times 2^{10-8} = 00\ 1010\ 000000$ $-y = 11\ 1010\ 000000$

(1): $[\Delta E_{补}] = [E_{x补}] - [E_{y补}] = 0100$

故对y对阶 $M_y = 000.000100$ $M_y = 000.000100$

$M_y + M_x = 000.000100 + 001.111000$ $M_y + M_x = 000.000100 + 001.111000$

$= 001.111100$ (无附加位) $= 001.111100$ (有附加位)

故 $E = 1110$ $M = 001.111100$

(2): $[\Delta E_{补}] = [E_{x补}] - [E_{y补}] = 0100$

故对-y对阶 $M_y = 111.111100$ $M_y = 111.111100$

$M_y + M_x = 001.111100 + 111.111100$ $M_y + M_x = 001.111000 + 111.111000$

$= 001.110100$ (无附加位) $= 001.110100$ (有附加位)

故 $E = 1110$, $M = 001.110100$

(3): $(15/16)\times 2^5 = m = \frac{15}{8}\times 2^4 = 1.111000\times 2^{12-8} = 00\ 1100\ 111000$

$(2/16)\times 2^7 = n = 1\times 2^4 = 1.000000\times 2^{12-8} = 00\ 1100\ 000000$ $-n = 11\ 1100\ 000000$

$[\Delta E_{补}] = [E_{m补}] - [E_{n补}] = 0000$

故不用对阶

$M_m + M_n = 001.111000 + 001.000000$

$= 010.111000$

$= 001.011100 \times 2$ (无附加位)

故 $E = 1100+1 = 1101$ $M = 001.011100$

$M_m + M_n = 001.111000 + 001.000000$

$= 010.111000$

$= 001.011100 \times 2$ (有附加位)

故 $E = 1100+1 = 1101$ $M = 001.011100$

(4): $[\Delta E_{补}] = [E_{m补}] - [E_{n补}] = 0001$

故对n对阶

$M_m + M_n = 001.111000 + 111.000000$

$= 000.111100$

$= 001.110000 \times 2^{-1}$ (无附加位)

故 $E = 1100-1 = 1011$ $M = 001.110000$

$M_m + M_n = 001.111000 + 111.000000$

$= 000.111100$

$= 001.110000 \times 2^{-1}$ (有附加位)

故 $E = 1100-1 = 1011$ $M = 001.110000$

(3): [x]...

12. $0.75 = 0.11 = 1.1\times2^{-1} = 1.1\times2^{126-127} = 0\ 01111110\ \overbrace{100\cdots0}^{23位(后略)} = x$

$-65.25 = -(1000001.01) = -(1.00000101\times2^{133-127}) = 1\ 10000101\ 00000101\cdots\cdots = y$

[ΔE移] = [Ex]移 - [Ey]移

= 0111110 + 0111011

= 1111001

结果为负，取补码有 0000111

故对x 对阶 7位

M_x = 00 .0000001100…0

M_x+M_y = 11.00000101 00…0 + 00.0000000110…0

= 11.0000010100…0

符号位11 故

故 E = 10000101 M = 11.0000000100…0

(2): 65.25 = 0 10000101 00000101 = -y

[ΔE移] = [Ex]移 - [Ey]移

= 1111001

取补码有 0000111

对x阶 7位
对

M_x = 00.0000001100…0

M_x+M_y = 00.00000101 0…0 + 00.0000000110…0

= 00.0000100…0

故 E = 1000101 M = 00.000100…0