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No.
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1　$X = 0.1011$　$Y = -0.0110$

C	P	Y
0	0000	△0110
0	0000	0△011
	+1011	
0	1011	~~0011~~
0	0101	10△01
	+1011	
1	0000	
0	1000	010△0
0	0100	0010△

$\therefore [X \times Y]_原 = -0.01000010$

2.　$X = 1.0111$　$Y = 0.1011$　$[-X]_补 = 0.1001$

P	Y	Y_{-1}
0000	△1011	0
+1001		
1001		
0100	1△101	1
0010	01△10	1
+0111		
1001		
0100	101△1	0
+1001		
1101		
0110	1101	1

$\therefore [X \times Y]_补 = 1.01101101$

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扫描全能王

3 X = 0.10100　　Y = −0.10001　　[−Y]补 = 0.01111

	R	Q
	0 1 0 1 0 0	0 0 0 0 0 _
+	1 0 1 1 1 1	
	0 0 0 0 1 1	0 0 0 0 0 1
	0 0 0 1 1 0	0 0 0 0 1 _
+	1 0 1 1 1 1	
	1 1 0 1 0 1	0 0 0 0 1 0
	1 0 1 0 1 0	0 0 0 1 0 _
+	0 1 0 0 0 1	
	1 1 1 0 1 1	0 0 0 1 0 0
	1 1 0 1 1 0	0 0 1 0 0 _
+	0 1 0 0 0 1	
	0 0 0 1 1 1	0 0 1 0 0 1
	0 0 1 1 1 0	0 1 0 0 1 _
+	1 0 1 1 1 1	
	1 1 1 1 0 1	0 1 0 0 1 0
	1 1 1 0 1 0	1 0 0 1 0 _
	0 1 0 0 0 1	
	0 0 1 0 1 1	1 0 0 1 0 1

∴ [X/Y]原 = 1.00101

陈子昂

2214001147

No.

Date

五.

4 $X=-0.1001$, $Y=0.1101$ $Y_{补}=1.0011$

	R	Q
	0 1 0 0 1	0 0 0 0
+	1 0 0 1 1	
	1 1 1 0 0	0 0 0 0 0
	1 1 0 0 0	0 0 0 0
+	0 1 1 0 1	
	0 0 1 0 1	0 0 0 0 1
	0 1 0 1 0	0 0 0 1
+	1 0 0 1 1	
	1 1 1 0 1	0 0 0 1 0
	1 1 0 1 0	0 0 1 0
+	0 1 1 0 1	
	0 0 1 1 1	0 0 1 0 1
	0 1 1 1 0	0 1 0 1
+	1 0 0 1 1	
	0 0 0 0 1	0 1 0 1 1

∴ [X/Y] 的商为 1.1011 余数为 0.0001×2^{-4}.

KOKUYO

No.

Date

5 $X=-0.1010$ $Y=0.1101$ $[-Y]_{补}=1.0011$

	R	Q
	01010	0000
+	10011	
	11101	0000
	11010	000
+	01101	
	00111	0001
	01110	001
+	10011	
	00001	0011
	00010	011
+	10011	
	10101	0110
	01010	110
+	01101	
	10111	01100

$\therefore [X/Y]_{原}=1.1100$

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Date

五

6证明：

$[x_0]_{补} = x_0.x_1x_2\cdots x_n$

$= -x_0\cdot 2^0 + x_1\cdot 2^{-1} + x_2\cdot 2^{-2} + \cdots + x_n\cdot 2^{-n}$

$= -x_0 + \sum_{i=1}^{n} x_i\cdot 2^{-i}$

7i证明：

$\because [x_{补}] = x_0.x_1x_2\cdots x_n$

又：$[x_{补}]$ 与 $[\frac{x}{2}]_{补}$ 符号相同

$\therefore [\frac{x}{2}]_{补} = x_0.x_0x_1x_2\cdots x_n$

8 $\because$ $CarryOut = B\cdot Cin + A\cdot Cin + A\cdot B$

$Sum = A\otimes B\otimes Cin$

又 $A\otimes B = \bar{A}\otimes\bar{B}$

$\therefore Sum = Sum'$

$CarryOut' = \bar{B}\cdot Cin + \bar{A}\cdot Cin + \bar{A}\cdot\bar{B}$

$\neq CarryOut.$

$\therefore$ 这种说法不对. 原全加器进行反变量运算时产生的进位信号与原进位信号不同会导致结果不同.

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9.(1) $C_1 = X_1 \cdot Y_1 + X_1 C_0 + Y_1 C_0$

$C_2 = X_2 \cdot Y_2 + X_2 \cdot C_1 + Y_2 C_1$

$C_3 = X_3 \cdot Y_3 + X_3 \cdot C_2 + Y_3 \cdot C_2$

$C_4 = X_4 \cdot Y_4 + X_4 \cdot C_3 + Y_3 \cdot C_3$

(2) 令 $G_i = A_i B_i$ $P_i = A_i + B_i$

$C_1 = G_0 + P_0 C_0$

$C_2 = G_1 + P_1 G_0 + P_1 P_0 C_0$

$C_3 = G_2 + P_2 G_1 + P_2 P_1 G_0 + P_2 P_1 P_0 C_0$

$C_4 = G_3 + P_3 G_2 + P_3 P_2 G_1 + P_3 P_2 P_1 G_0 + P_3 P_2 P_1 P_0 C_0$

10(1) $a_1 = 1$ $a_2 = \begin{cases} 1 & x - \frac{3}{4} \geq 0 \\ 0 & x - \frac{3}{4} < 0 \end{cases}$ $a_3 = \begin{cases} 1 & x - \frac{7}{8} \geq 0 \\ 0 & x - \frac{7}{8} < 0 \end{cases}$

$a_4 = \begin{cases} 1 & x - \frac{15}{16} \geq 0 \\ 0 & x - \frac{15}{16} < 0 \end{cases}$ $a_5 = \begin{cases} 1 & x - \frac{31}{32} \geq 0 \\ 0 & x - \frac{31}{32} < 0 \end{cases}$ $a_6 = \begin{cases} 1 & x - \frac{63}{64} \geq 0 \\ 0 & x - \frac{63}{64} < 0 \end{cases}$

(2) $a_1 = 0$ $a_2 = 0$ $a_3 = 1$

$a_4 = \begin{cases} 1 & x - \frac{3}{16} \geq 0 \\ 0 & x - \frac{3}{16} < 0 \end{cases}$ $a_5 = \begin{cases} 1 & x - \frac{7}{32} \geq 0 \\ 0 & x - \frac{7}{32} < 0 \end{cases}$ $a_6 = \begin{cases} 1 & x - \frac{15}{64} \geq 0 \\ 0 & x - \frac{15}{64} < 0 \end{cases}$

(3) $a_1 = 0$ $a_2 = \begin{cases} 1 & x = \frac{1}{4} \\ 0 & x \neq \frac{1}{4} \end{cases}$ $a_3 = \begin{cases} 1 & x \geq \frac{1}{8} \\ 0 & x < \frac{1}{8} \end{cases}$

$a_4 = \begin{cases} 1 & x < \frac{1}{8} \\ 0 & x \geq \frac{1}{8} \end{cases}$ $a_5 = \begin{cases} 1 & x - x/16 \geq \frac{1}{32} \\ 0 & x - x/16 < \frac{1}{32} \end{cases}$ $a_6 \begin{cases} 1 & x - x/32 \geq \frac{1}{64} \\ 0 & x - x/32 < \frac{1}{64} \end{cases}$

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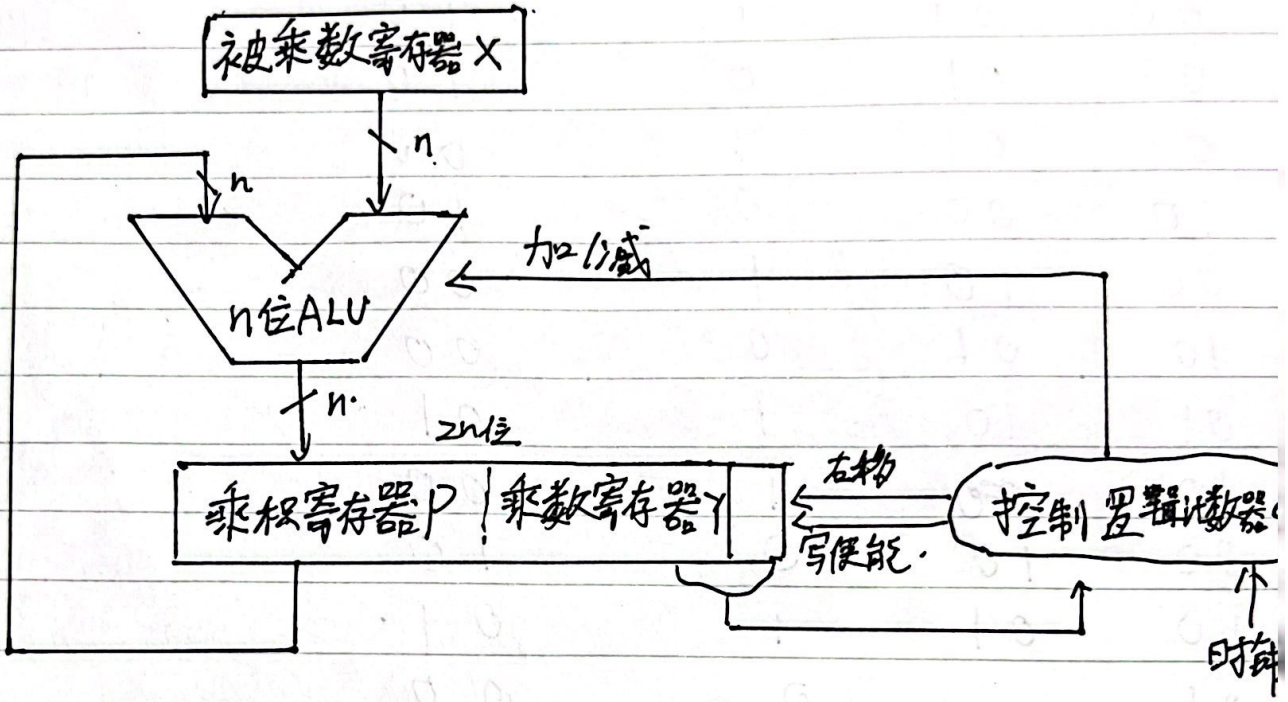
11 原码一位乘法 29NS
补码一位乘法 31NS
原码加减交替除法 31NS
补码加减交替除法 33NS.

12



13	A	B	Carry	Sum
	00	00	0	00
	00	00	1	01
	01	00	0	01
	01	00	1	10
	00	01	0	01
	00	01	1	10
	01	01	0	10
	01	01	1	00
	10	00	0	10
	00	10	1	00
	10	01	0	00
	01	10	1	01
	10	00	1	00
	00	10	0	10
	10	01	1	01
	01	10	0	00
	10	10	0	01
	10	10	1	10

$$S_0 = \bar{a_1}\cdot\bar{a_0}\cdot\bar{b_1}\cdot\bar{b_0}\cdot c + \bar{a_1}\cdot a_0\cdot\bar{b_1}\cdot\bar{b_0}\cdot\bar{c} + \bar{a_1}\cdot a_0\cdot\bar{b_1}\cdot b_0\cdot\bar{c}$$
$$+ \bar{a_1}\, a_0\, b_1\,\bar{b_0}\cdot c + a_1\,\bar{a_0}\,\bar{b_1}\, b_0\cdot c + a_1\,\bar{a_0}\, b_1\cdot\bar{b_0}\cdot\bar{c}$$