

Домашнее задание 7

УМНОЖЕНИЕ ЧИСЕЛ С ПЛАВАЮЩЕЙ ЗАПЯТОЙ

Вариант 9

$$A = 3,4; B = 0,07$$

Формат Ф1

$$A = 3,4 = (3,666)_{16} = (0,3666)_{16} \cdot 16^1$$

0	1	0	0	0	0	0	1	0	0	1	1	0	1	1	0	0	1	1	0
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

$$B = 0,07 = (0,11EB)_{16} \cdot 16^0$$

0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	1	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

$$X_C = X_A + X_B - d = 1000001$$

Ускоренное умножение на 2 разряда множителя:

N	Операнды	СЧП (Старшие разряды)	В/СЧП (младшие разряды)	Признак коррекции
0	СЧП	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 1 0 0 0 1 1 1 1 1 1	0
1	$[-M_A]_{\text{доп}}$	1 1 1 1 1 0 0 1 0 0 1 1 0 1 0		$-M_A$
	СЧП	1 1 1 1 1 0 0 1 0 0 1 0 1 0	0 0 0 1 0 0 0 1 1 1 1 1 1	1
	СЧП->2	1 1 1 1 1 1 1 0 0 1 0 0 1 1 0	1 0 0 0 0 1 0 0 0 1 1 1 1	
2	СЧП->2	1 1 1 1 1 1 1 1 0 0 1 0 0 1	1 0 1 0 0 0 0 1 0 0 0 1	1
3	$2M_A$	0 0 0 0 1 1 0 1 1 0 0 1 1 0 0		$2M_A$
	СЧП	0 0 0 0 1 1 0 1 0 0 1 0 1 0 1	1 0 1 0 0 0 0 1 0 0 0 1	0
	СЧП->2	0 0 0 0 0 0 1 1 0 1 0 0 1 0 1	0 1 1 0 1 0 0 0 0 1 0 0	
4	СЧП->2	0 0 0 0 0 0 0 0 1 1 0 1 0 0 1	0 1 0 1 1 0 1 0 0 0 0 1	0
5	M_A	0 0 0 0 0 1 1 0 1 1 0 0 1 1 0		M_A
	СЧП	0 0 0 0 0 1 1 1 1 0 0 1 1 1 1	0 1 0 1 1 0 1 0 0 0 0 1	0
	СЧП->2	0 0 0 0 0 0 0 1 1 1 1 0 0 1 1	1 1 0 1 0 1 1 0 1 0 0 0	
6	СЧП->2	0 0 0 0 0 0 0 0 0 1 1 1 1 0 0	1 1 1 1 0 1 0 1 1 0 1 0	0
	$4 < M_C$	0 0 0 0 0 1 1 1 1 0 0 1 1 1 1	0 1 0 1 1 0 1 0 0 0 0 0	

$$X_C = X_C - 1 = 1000000$$

0	1	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	1	1	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

$$C^* = (0,3CF) \cdot 16^0 = 0,238037109375$$

$$\Delta C = C_T - C^* = 0,238 - 0,238037109375 = 0,000037109375$$

$$\delta C = \frac{\Delta C}{C_T} \cdot 100\% = 0,016\%$$

Формат Ф2

$$A = 3,4 = (11,0110011001)_2 = (0,110110011001)_2 \cdot 2^2$$

0	1	0	0	0	0	0	1	0	1	0	1	1	0	0	1	1	0	0	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

$$B = 0,07 = (0,000100011110101)_2 = (0,100011110101)_2 \cdot 2^{-3}$$

0	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	0	1	0	1
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$$X_C = X_A + X_B - d = 11111111$$

N	Операнды	СЧП(старшие разряды)																В/СЧП(младшие разряды)												Признак коррекции	
0	СЧП	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	1	0	1	0	1	0	
	4M _A	0	0	0	1	1	0	1	1	0	0	1	1	0	0	1	0	0									4M _A	M _A			
	M _A	0	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	1													
1	СЧП	0	0	1	0	0	0	0	1	1	1	1	1	1	1	1	0	1	1	0	0	0	1	1	1	1	0	1	0	1	1
	СЧП->4	0	0	0	0	0	0	1	0	0	0	0	1	1	1	1	1	1	1	0	1	1	0	0	0	1	1	1	0		
	2M _A	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	1	0								-4M _A	2M _A				
	-4M _A	1	1	1	0	0	1	0	0	1	1	0	0	1	1	1	0	0													
2	СЧП	1	1	1	1	0	1	0	0	1	0	0	0	0	1	1	0	1	1	1	0	1	1	0	0	0	1	1	1	0	0
	СЧП->4	1	1	1	1	1	1	1	0	1	0	0	1	0	0	0	0	1	1	0	1	1	1	0	1	1	0	0	0		
	8M _A	0	0	1	1	0	1	1	0	0	1	1	0	0	1	0	0	0								8M _A	M _A				
	M _A	0	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	1													
3	СЧП	0	0	1	1	1	1	0	0	0	1	1	1	1	0	0	0	1	1	1	0	1	1	1	0	1	1	0	0	0	
	СЧП->4	0	0	0	0	0	0	1	1	1	1	0	0	0	1	1	1	1	0	0	0	1	1	1	0	1	1	1	0	1	
	<- M _C	0	0	0	0	0	1	1	1	1	0	0	0	1	1	1	1	0	0	0	1	1	1	0	1	1	1	0	1	0	

$$X_C = X_C - 1 = 11111110$$

$$C^* = (0,111100011110)_2 \cdot 2^{-2} = (0,00111100011110)_2 = 0,2362060546875$$

0	1	1	1	1	1	1	1	0	1	1	1	0	0	0	1	1	1	1	0
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$$\Delta C = C_T - C^* = 0,238 - 0,2362060546875 = 0,00179394531$$

$$\delta C = \frac{\Delta C}{C_T} \cdot 100\% = 0,75\%$$

Погрешности операндов вызваны неточным представлением операндов.