**Домашнее задание №6**

Вариант: 9

Выполнил: Лебедев Вадим

Группа: P3110

A = 83, 42

B = 59, 82

1. Формат *Ф1* (число разрядов мантиссы *m* =12).

83,42 = (53,6B)16 = (0,537)16 \* 102 (порядок = 2)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 |

1 округ

к ближ.

59,82 = (3B,D)16 = (0,3BD)16 \* 102 (порядок = 2)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |

1 округ

к ближ.

1) *XA* = \_1 0 0 0 0 1 0

*XB* = 1 0 0 0 0 1 0

(*XA-XB*)доп .= 1. 0 0 0 0 0 0 0

(*XA-XB*). = 0;

*ХС= XA = XB = 2*

а) Оба операнда положительные (*А*>0, *B*>0):т.к. порядок равен нулю, сдвига не происходит.

2,3) М*А* = . 0 1 0 1 0 0 1 1 0 1 1 1

+

М*В* = . 0 0 1 1 1 0 1 1 1 1 0 1

М*С* = . 1 0 0 0 1 1 1 1 0 1 0 0

(0.100011110100)2 \* 162 = (0, 8F4)16 \* 162 = 8F,4 = 143, 25

Δ*С* = *С*Т - *С*\* = 143, 24 – 143, 25 = -0,01,

δ*С* = · 100% = \* 100% = 0,006%,

б) *А*<0, *B*>0.

Сложение мантисс будем проводить их прямым вычитанием. В качестве уменьшаемого используем мантиссу положительного операнда (*В*);

2,3) М*В* = . 0 0 1 1 1 0 1 1 1 1 0 1

М*А* = . 0 1 0 1 0 0 1 1 0 1 1 1

М*С* = . 0 0 0 1 0 1 1 1 1 0 1 0

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 |

*С*

0 1  7 8 19

*С*\* = М*С* · 16Р*с* = (0,17A)16 · 162 = (17,A)16 = 23,625.

Δ*С* = *С*Т - *С*\* = 23,60 – 23,625 = -0,025,

δ*С* = · 100% = \* 100% = 0,1%.

2. Формат *Ф2*.

*А* = (83,42)10 = (0,101001101101)2 · 27

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 |

19 18 11 10 0  
*В* = (59,82)10 = (0,111011110100)2 · 26

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |

19 18 11 10 0

1) *XA* = \_1 0 0 0 0 1 1 1

*XB* = 1 0 0 0 0 1 1 0

(*XA-XB*)доп.= 1 1 1 1 1 1 1 1

(*XA-XB*). = 1; *ХС = ХA* = 7*.*

а) Оба операнда положительные (*А*>0, *B*>0):

2,3) М*А* = . 1 0 1 0 0 1 1 0 1 1 0 1

+

М*В* = . 0 1 1 1 0 1 1 1 1 0 1 0 (сдвиг вправо на 1)

М*С* = 1. 0 0 0 1 1 1 1 0 0 1 1 1

Результат сложения денормализован влево.

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4) МС = . 1 0 0 0 1 1 1 1 0 0 1 1

Т.к. выполнен сдвиг мантиссы влево, то характеристику результата нужно увеличить на 1 (*ХС* = *ХС* +1 = 8).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |

*С*\* = М*С* · 2Р*с* = (0,100011110011)2 · 28 = (10001111,0011)2 = 143,1875.

Δ*С* = *С*Т - *С*\* = 143,24 – 143,1875=0,0525,

δ*С* = · 100% = \* 100% = 0,03%.

б) *А*<0, *B*>0.

2,3) М*B* = . 0 1 1 1 0 1 1 1 1 0 1 0 (сдвиг вправо на 1)

М*A* = .1 0 1 0 0 1 1 0 1 1 0 1

М*С* = .0 0 1 0 1 1 1 1 0 0 1 1

Результат денормализован, поэтому делаем сдвиг влево на 2 разряда, из-за чего порядок уменьшается на 2.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

*С*

19 18 11 10 0

*С*\* = М*С* · 2Р*с* = (0,10111100112 · 25 = (10111,10011)2 = 23,59.

*С*Т = (А - B)10 = 23,6010

Δ*С* = *С*Т - *С*\* = 23,60 – 23,59 = 0,01,

δ*С* = · 100% = \* 100% = 0,042%.