

# 作业 3

1.

$$[A]_{\text{原}} = 0.001\ 0010$$

$$[B]_{\text{原}} = 1.011\ 0100$$

$$[B]_{\text{补}} = 1.100\ 1100$$

$$[A+B]_{\text{补}} = [A]_{\text{补}} + [B]_{\text{补}} = 1.101\ 1110$$

$$A+B \text{真值为} -\frac{17}{64}$$

2.

$$|x| = 0.110111$$

$$|y| = 0.101110$$

	高位部分积	低位部分积/乘数	丢弃位
	<b>0.000000</b>		
+	<b>0.000000</b>	<b>101110</b>	
→	<b>0.000000</b>		
+	<b>0.110111</b>	<b>010111</b>	<b>0</b>
→	<b>0.110111</b>		
+	<b>0.011011</b>	<b>101011</b>	<b>10</b>
→	<b>1.010010</b>		
+	<b>0.101001</b>	<b>010101</b>	<b>110</b>
→	<b>1.100000</b>		
+	<b>0.110000</b>	<b>001010</b>	<b>1110</b>
→	<b>0.110000</b>		
+	<b>0.011000</b>	<b>000101</b>	<b>01110</b>
→	<b>1.001111</b>		
+	<b>0.110111</b>	<b>100010</b>	<b>101110</b>
→	<b>0.100111</b>		

$$xy = -0.100111\ 100010$$

3.

$$[x]_{\text{补}} = 11.0011 \quad [-x]_{\text{补}} = 00.1101 \quad [y]_{\text{补}} = 00.1001$$

	高位部分积	低位部分积/乘数	丢弃位
	00.0000		辅助位
$+[-x]_{\text{补}}$	00.1101	01001	0
→	00.1101		
	00.0110	10100	10
$+ [x]_{\text{补}}$	11.0011		
→	11.1001		
	11.1100	11010	010
$+0$	00.0000		
→	11.1100		
	11.1110	01101	0010
$+ [-x]_{\text{补}}$	00.1101		
→	00.1011		
	00.0101	10110	10010
$+ [x]_{\text{补}}$	11.0011		
	11.1000	1011	010010

$$[xy]_{\text{补}} = 11.10001011$$

4.

$$[x]_{\text{补}} = 00.11011 \quad [-x]_{\text{补}} = 11.00101 \quad [y]_{\text{补}} = 11.00011$$

	高位部分积	低位部分积/乘数	丢弃位
	00,00000		辅助位
$+ [-x]_{\text{补}}$	11,00101	100011	0
→	11,00101		
	11,10010	110001	10
$+0$	00,00000		
→	11,10010		
	11,11001	011000	110
$+ [x]_{\text{补}}$	00,11011		
→	00,10100		
	00,01010	001100	0110
$+0$	00,00000		
→	00,01010		
	00,00101	000110	00110
$+0$	00,00000		
→	00,00101		
	00,00010	100011	000110
$+ [-x]_{\text{补}}$	11,00101		
	11,00111		

$$xy = 11,0011110001 = -1100001111$$

5.

$$|x|=0.100111 \quad |y|=0.101011 \quad [y]_{\text{补}}=0.101011 \quad [-y]_{\text{补}}=1.010101$$

被除数/余数	商
<b>0.100111</b>	
<b>+<math>[-y]_{\text{补}}</math> 1.010101</b>	
<b>1.111100</b>	
<b>← 1.111000</b>	<b>0</b>
<b>+<math>[y]_{\text{补}}</math> 0.101011</b>	
<b>0.100011</b>	
<b>← 1.000110</b>	<b>01</b>
<b>+<math>[-y]_{\text{补}}</math> 1.010101</b>	
<b>0.011011</b>	
<b>← 0.110110</b>	<b>011</b>
<b>+<math>[-y]_{\text{补}}</math> 1.010101</b>	
<b>0.001011</b>	
<b>← 0.010110</b>	<b>0111</b>
<b>+<math>[-y]_{\text{补}}</math> 1.010101</b>	
<b>1.101011</b>	
<b>← 1.010110</b>	<b>01110</b>
<b>+<math>[y]_{\text{补}}</math> 0.101011</b>	
<b>0.000001</b>	
<b>← 0.000010</b>	<b>011101</b>
<b>+<math>[-y]_{\text{补}}</math> 1.010101</b>	
<b>1.010111</b>	
<b>+<math>[y]_{\text{补}}</math> 0.101011</b>	<b>0111010</b>
<b>0.000010</b>	

$$x/y = 0.111010$$

$$x \% y = 0.000010 \times 2^{-6}$$

6.

$$x=00101,00.101100$$

$$y=00100,11.011100$$

1.对阶

$$\textcircled{1} \text{阶差: } \Delta E = 00101 + 11100 = 00001 > 0$$

$$\textcircled{2} \text{对阶: } y: 00100,11.011100 \rightarrow 00101,11.101110$$

2.尾数相加

$$00.101100 + 11.101110 = 00.011010$$

3.规格化

$$x+y = 00101,00.011010 \rightarrow 00100,00.110100$$

4.舍入: 无需处理

5.溢出判断: 常阶码无溢出

$$\text{故结果为 } 2^4 \times (0.110100)_2$$