3801 Homework #4

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Problem 1:

compute the signed product of (1100_2) * (0101_2)   (-4 * 5 = -20)

	Iteration	Multiplicand	Sign	Product = HI, LO
0	Initialize (LO = Multiplier)	1100		0000 0101
1	LO[0] = 1 => ADD	+	1	1100 0101
	srl 1	1100		1110 0010
2	LO[0] = 0 => Do Nothing			
	srl 1	1100		1111 0001
3	LO[0] = 1 => ADD	+	1	1011 0001
	srl 1	1100		1101 1000
4	LO[0] = 0 => Do Nothing			
	srl 1	1100		1110 1100

Problem 2:

compute the signed product of (0101_2) * (0101_2)   (5 * 5 = 25)

	Iteration	Multiplicand	Sign	Product = HI, LO
0	Initialize (LO = Multiplier)	0101		0000 0101
1	LO = 1 => ADD	+	0	0101 0101
	srl 1	0101		0010 1010
2	LO = 0 => Do Nothing			
	srl 1	0101		0001 0101
3	LO = 1 => ADD	+	0	0110 0101
	srl 1	0101		0011 0010
4	LO = 0 => Do Nothing			
	srl 1	0101		0001 1001

Problem 3:

compute the unsigned division of (1110_2) / (0100_2)   (14 / 4 = 3R2)

	Iteration	Remainder	Divisor	Difference	Quotient
0	Initialize	0000 1110	0100 0000		0000
1	Get Difference	0000 1110	0010 0000	1110 1110	0000
	Diff < 0 => Do Nothing				
2	Get Difference	0000 1110	0001 0000	1111 1110	0000
	Diff < 0 => Do Nothing				
3	Get Difference	0000 1110	0000 1000	0000 0110	0000
	Diff > 0 => Set lsb Quot, rem=dif	0000 0110			0001
4	Get Difference	0000 0110	0000 0100	0000 0010	0010
	Diff > 0 => Set lsb Quot, rem=dif	0000 0010			0011

Problem 4:

compute the unsigned division of (1111_2) / (0101_2)   (15 / 5 = 3R0)

	Iteration	Remainder	Divisor	Difference	Quotient
0	Initialize	0000 1111	0101 0000		0000
1	Get Difference	0000 1111	0010 1000	1110 0111	0000
	Diff < 0 => Do Nothing				
2	Get Difference	0000 1111	0001 0100	1111 1011	0000
	Diff < 0 => Do Nothing				
3	Get Difference	0000 1111	0000 1010	0000 0101	0000
	Diff > 0 => Set lsb Quot, rem=dif	0000 0101			0001
4	Get Difference	0000 0101	0000 0101	0000 0000	0010
	Diff = 0 => Set lsb Quot, rem=dif	0000 0000			0011