EE 2720, Spring 07

HW #2

Due date to be announced later.

Enjoy your homework

Friendly

Alex

EE 2720 Homework #2

Note: Please **STAPLE** your homework

Problem 1: What is the Dynamic Range (DR) of a 6-bit integer binary signed-magnitude system?

Problem 2: Provide a 6-bit signed-magnitude representation for the number $+27_{10}$. Your 6-bit representation must be given in binary.

Problem 3: Provide a 6-bit binary signed-magnitude representation for the number -20_{10}.

Problem 4: Find the 10's complement of the number 35865_{10}. Use both ways for finding the 10's complement of a number provided in handout #2.

Problem 5: What is the Dynamic Range (DR) of an 8-bit integer binary two's-complement system?

Problem 6: Using the lemma on page 13 of handout #2 find the value of the following two's-complement number: 11011011_2.

Problem 7: find the two's-complement of the number X where $X=11011010_2$.

Problem 8: Using the two's-complement system perform X-Y where $X=101010_2=-22_{10}$ and $Y=000101_2=+5_{10}$.

Problem 9: Using the two's-complement system perform the addition of the 6-bit numbers X and Y where $X=011001_2=+25_{10}$ and $Y=011011_2=+27_{10}$. Do you have an overflow or underflow in this case? Justify your answer.

Problem 10: Using the two's-complement system perform the addition of the 6-bit numbers X and Y where $X=101100_2=-20_{10}$ and $Y=110001_2=-15_{10}$. Do you have an overflow or underflow in this case? Justify your answer.

Problem 11: Find the 9s'-complement of the number 85357_{10}. Use both ways for finding the 9s'-complement of a number provided in handout #3.

Problem 12: What is the Dynamic Range (DR) of a 7-bit integer ones'-complement system?

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Problem 13: Using the lemma on page 8 of handout #3 find the value of the following ones'-complement number: 101110_2.

Problem 14: Find the ones'-complement of the number X where $X=11011010_2$.

Problem 15: Using the ones'-complement system perform X-Y where $X=101010_2=-21_{10}$ and $Y=000101_2=+5_{10}$.

Problem 16: Using the ones'-complement system perform the addition of the 6-bit numbers X and Y where $X=011001_2=+25_{10}$ and $Y=011011_2=+27_{10}$. Do you have an overflow or underflow in this case? Justify your answer.

Problem 17: Using the ones'-complement system perform the addition of the 6-bit numbers X and Y where $X=101100_2=-19_{10}$ and $Y=110001_2=-14_{10}$. Do you have an overflow or underflow in this case? Justify your answer.

Problem 18: Perform the addition X+Y where X and Y are the following 6-bit signed-magnitude numbers: $X=010101_2=+21_{10}$ and $Y=111111_2=-31_{10}$. Follow the same procedure as the one of the example on pages 23-24 of handout #3.

Problem 19: Perform the unsigned binary multiplication with multiplicand $X=1100_2=12_{10}$ and multiplier $Y=1111_2=15_{10}$.

Problem 20: Perform the signed two's-complement binary multiplication with multiplicand $X=1001_2=-7_{10}$ and multiplier= $Y=1010_2=-6_{10}$.

Problem 21: Perform in BCD the addition 8+7.

Problem 22: Perform in BCD the addition 3+4.

Problem 23: Starting from the 3-bit Gray code that I provided on page 12 of handout #4, construct a 4-bit Gray code.