HW1

1. (8%) What is the exact number of bits in a system that contains (a) 64K byte and (b) 1.5G byte?
2. (36%) Convert the following numbers (all unsigned) from the given base to other three bases listed in the table (to the 4th digit after radix point):

Decimal	Binary	Octal	Hexadecimal
53.217	**?**	**?**	**?**
?	**1011.1101**	**?**	**?**
?	**?**	**48.37**	**?**
?	**?**	**?**	**D9.1A**

3. (10%) Convert decimal +37 and +62 to binary, using the signed-2's-complement representation and enough digits to accommodate the numbers, Then, perform the binary equivalent of (+37)+(-62) and (-37)+(-62) using addition. Convert the answers back to decimal and verify that they are correct.
4. (8%) Perform on the given **unsigned binary numbers** using the 2's complement of the subtrahend Where the result should be negative, find its 2's complement and affix a minus sign. (a)10110 – 10001, (b)1101 – 101010
5. (16%) Write the word "NTHUEECS" in ASCII using an eight-bit code including the space. Treat the leftmost bit of each character as a parity bit. Each 8-bit code should have even parity.
6. (8%) For an 8-bit sequence is 1001 0101. What is its content if it represents (a) two decimal digits in BCD? (b) two decimal number in the Excess-3 code? (c) an 8-bit unsigned number? (d) an 8-bit signed number?
7. (4%) If you have 35 books and want to give each book a unique id with a binary number. If we want to use as least as possible the number of bits as the id, how many bits do you need?
8. (10%) Find the Gray code sequence of 12 codes in a group.

