HW1

1. (36%) Convert the following numbers from the given base to other three bases listed in the table (to the 4th digit after radix point):

Decimal	Binary	Octal	Hexadecimal
76.28	**?**	**?**	**?**
?	**1001.1010**	**?**	**?**
?	**?**	**48.37**	**?**
?	**?**	**?**	**7F.24**

2. (16%) Perform the subtraction with the following unsigned binary numbers by taking the 2's complement of the subtrahend. (a) 0101 – 0111, (b) 10101 – 0110, (c) 1011101 – 1111001, (d) 101011 – 1101.
3. (16%) Convert decimal +29 and +75 to binary, using the signed-2's-complement representation and enough digits to accommodate the numbers, Then, perform the binary equivalent of (+29)+(-75) and (-29)+(-75) using addition. Convert the answers back to decimal and verify that they are correct.
4. (8%) Write the word "NTHU" 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.
5. (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?
6. (4%) If you have 20 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?
7. (12%) Find the Gray code sequence of 14 code words.

