CS 61 – Homework #1
Summer 2 2002. Prof. Hwang
Given August 1, 2002. Due August 6, 2002 at the beginning of class.

1. Given the following binary string

   1100 1000 0101 1101

   a) Convert to hexadecimal.

   b) Convert to octal.

   c) Convert to positive integer.

   d) Convert to 2’s complement integer.

   e) Convert to 7-bit ASCII, i.e. use 7 bits per ASCII character.

   f) Convert to BCD

   g) Convert to decimal fraction. Assume that the sign exponent field is 6 bits and the normalized fraction field is 9 bits.
2. Perform the following calculations in 5-bit 2’s complement arithmetic. Specify whether there is an overflow and/or an overflow error.

a) \[ \begin{array}{c}
    1 & 1 & 0 & 0 & 1 \\
    + & 1 & 0 & 1 & 1 & 0 \\
\end{array} \]

b) \[ \begin{array}{c}
    1 & 1 & 0 & 0 & 1 \\
    \_ & 1 & 0 & 1 & 1 & 0 \\
\end{array} \]

c) \[ \begin{array}{c}
    1 & 1 & 0 & 0 & 1 \\
    \times & 1 & 0 & 1 & 1 & 0 \\
\end{array} \]

3) Perform the following calculation using positive integers.

\[ \begin{array}{c}
    10110 \) 1 & 1 & 0 & 1 & 0 & 0 & 1 \\
\end{array} \]

4) Analyze the following circuit by deriving the truth table for it.

![Circuit Diagram]