ECE 150 Digital Logic Design, Fall 2022
Quiz 1, September 14th 2022

Problem 1.

(a) Write the Hexadecimal number, $C12_{16}$, as a sum of symbols (their equivalent decimal value) times weighting-factors.

(b) Convert $C12_{16}$ to binary and compute its sum with $0011\ 0000\ 1111_2$.

Solution.

(a)
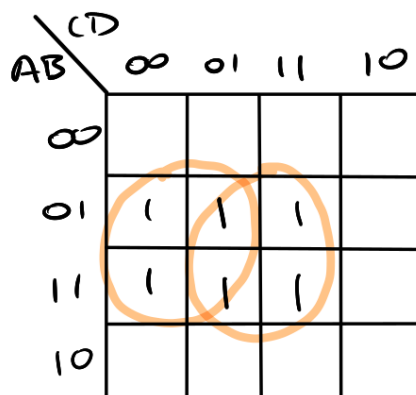$$C12_{16} = 12 \times 16^2 + 1 \times 16^1 + 2 \times 16^0$$

(b) $C12_{16} = 1100\ 0001\ 0010_2$.

$$
\begin{array}{rccc}
\text{carry:} & 0000 & 0011 & 1100 \\
 & 0011 & 0000 & 1111_2 \\
+ & 1100 & 0001 & 0010_2 \\
\hline
 & 1111 & 0010 & 0001_2
\end{array}
$$

Problem 2. Simplify the following boolean expression using a Karnaugh-Map.

$$X = B\overline{C}\,\overline{D} + \overline{A}B\overline{C}D + AB\overline{C}D + \overline{A}BCD + ABCD$$

Solution.

$$X = B\overline{C} + BD$$