BIRZEIT UNIVERSITY

Electrical and Computer Engineering ENCS 234: Chapter 2
Homework # 2

---

1. Simplify the following Boolean function to minimum number of literals
   a. $xy + xy'$
   b. $(A + B)'.(A' + B')$
   c. $A'B'C'D' + A'B'C'D + A'BC'D' + A'BC'D$

2. Draw the logic diagrams for:
   a. $F = A'BC + A(B + C')$
   b. $F = (A + B)(B + C)(AB)$
   c. $F = AB + BC(D + A)$

3. For the following Boolean function, find the truth table and express it in Sum *of Minterms* and *Product of Maxterms*

$$F(W, X, Y, Z) = W + W'XY + W'XYZ$$

4. Convert the following Boolean function into *Product of Sums*

$$F = AB + AB'C$$

5. Given the following boolean function, implement it using AND,OR and NOT gates

$$F = A'B + B'C + B'C'$$

6. Given the following Boolean functions

$$F_1(A, B, C) = AB + C$$
$$F_2(A, B, C) = A + AB + ABC$$

   a. Show that the Boolean function $F = F_1 + F_2$ contains the *Sum of minterms* of F_1 and F_2
   b. Show that the Boolean function $F=F_1.F_2$ contains only the *minterms* that are common to F_1 and F_2