**HW3**

1. (10%) Simplify the following Boolean functions or expression, using three-variable maps:
   1. 
   2. 
2. (20%) Simplify the following Boolean functions by first finding the essential prime implicants (Please indicate the essential prime implicants and prime implicants):
   1. 
   2. 
3. (10%) Simplify the following expressions in (a) sum of products and (b) product of sums:



1. (20%) Simplify the following Boolean function F, together with the don’t-care conditions d, and then express the simplified function in sum of products:
   1. 
   2. 
2. (10%) Simplify the following expression, and implement it with two-level NAND gates:



1. (10%) Simplify the following expression, and implement it with two-level NOR gates:



1. (20%) Simplify the following Boolean function F, using the two-level forms (a) AND-OR-Inverter, (b) OR-AND-Inverter logic diagrams

