# CSIE 2344: Discussion (Unit 7)

## 1 Two-Level Gate Circuits I

Find eight different simplified two-level gate circuits to realize $F(A, B, C, D) = A'BD + AC'D$.

## 2 Two-Level Gate Circuits II

Implement $F(A, B, C, D) = \sum m(3, 4, 5, 6, 7, 11, 15)$ as a two-level gate circuit, using (1) NAND gates only, (2) OR and NAND gates, and (3) NAND and AND gates.

## 3 NAND and NOR Gate Circuits

Convert the following circuit to (1) all NAND gates and (2) all NOR gates.