1 Administrivia

Announcements

Collect homework assignments.

Any interest in ACM Programming Contest?

Assignment

Read 2.8.

New homework assignment.

From Last Time

Simplifying K-maps.

Outline

1. NAND gates.

2. Two-level physical realizations.
3. Parity generation and checking.

4. BCD to 7-segment decoder example.

Coming Up

Circuit technologies.

2 NAND Gates


2. At the physical level, this is what we work with.

3. Completeness: Given a two-input NAND show how to implement inverter, AND, OR.

4. NOR completely analogous.

3 Physical Realizations

Given that we only have NAND gates, implement: \(ABC + DEF + GHI\). (Draw using AND and OR, derive NAND implementation, and draw.)

4 Parity Generation and Checking

1. EXOR symbol, truth table.

2. EXOR = odd function. (NEXOR = even)

3. A “big” EXOR can be recursively constructed from “small” EXORs.

4. Parity generate and check circuit for ASCII data:
Show a few examples.

5 Example: BCD to 7-Segment Decoder

Simplify and implement $S_4$.  

Parity Error