Department of Computer Engineering
Faculty of Engineering, University of Peradeniya
CO221 : Digital Design
Lab 5 - Prelab

- Each individual should have a written/printed pre-report.
- No need to waste your time unnecessarily on neatness.
- Write down the intermediate steps while you solve the problem.
- If you need help put a post in the forum for CO221 in FEeLS rather than copying from someone else.
- If you are caught copying you get 0 for the prelab and also the marks for the rest of the lab would be reduced by 50%.

When designing logic circuits, you are only allowed to use only following gates

- Inverters
- 2-input AND, OR, NAND, NOR, XOR

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1. Show the validity of following theorems using truth tables.
    a. DeMorgan's theorem
    b. Distributive law
    c. Absorption law

2. Design an odd number indicator for a 3-bit binary number. Output is 1 for odd numbers and 0 otherwise.
    a. Draw the truth table.
    b. Draw the Karnaugh map.
    c. Derive the simplified Boolean equation using the Karnaugh map.
    d. Draw the logic circuit.

3. Design a circuit for a 3-bit binary input value, that outputs 1 if the input is less than 3 or greater than 5.
    a. Draw the truth table.
    b. Draw the Karnaugh map.
    c. Derive the simplified Boolean equation using the Karnaugh map.
    d. Draw the logic circuit.