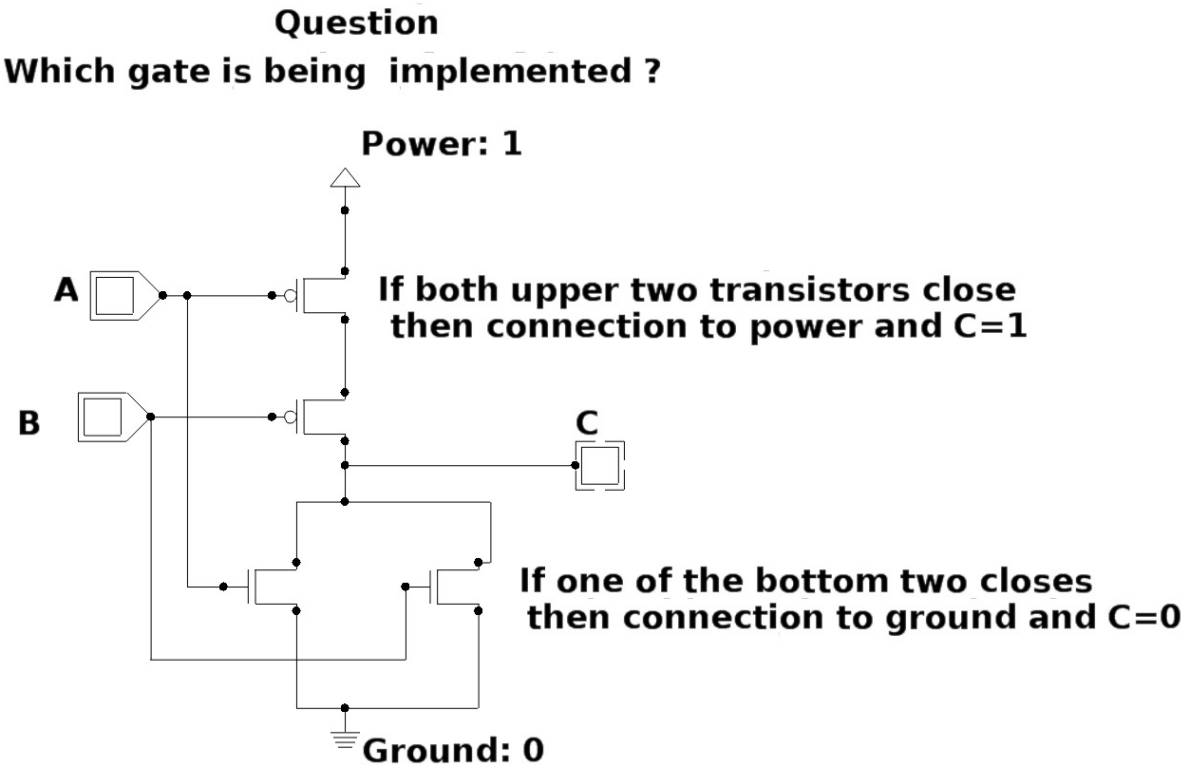
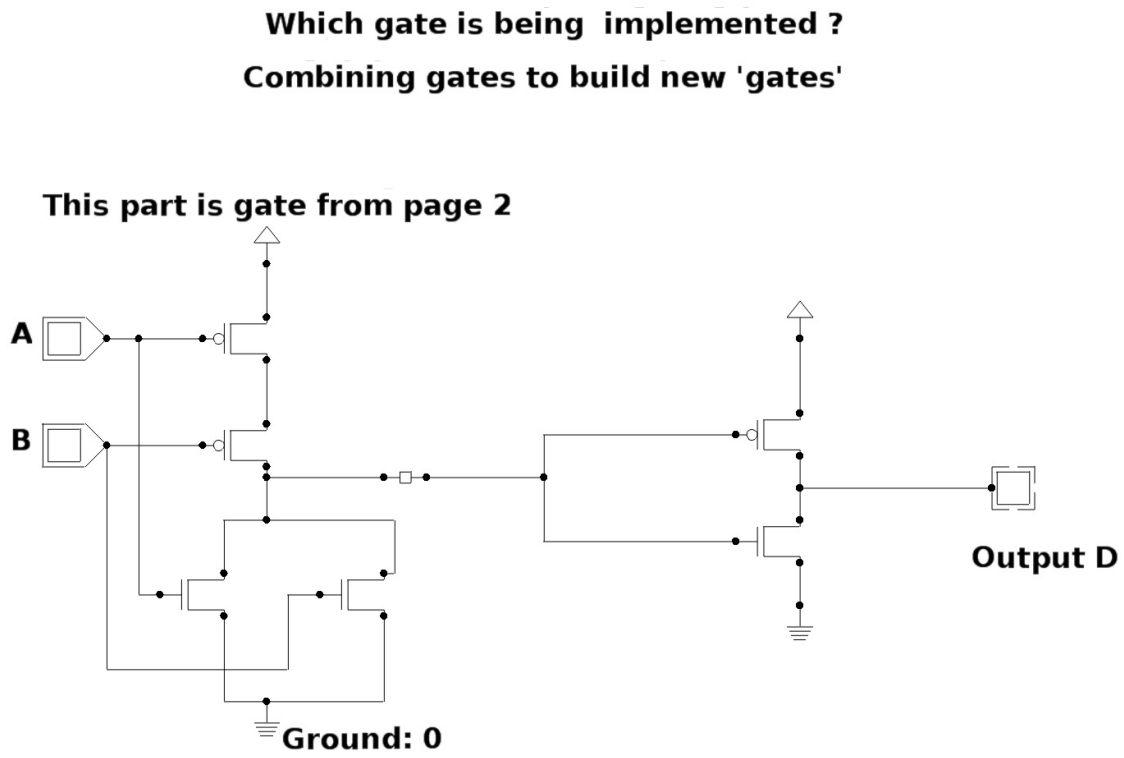
In-Class Exercises Week 2
Using circuits from Cedar Logic Set1.cdl

Circuits: Set1 – Page 1 is NAND Gate
Page 2 is NOR Gate



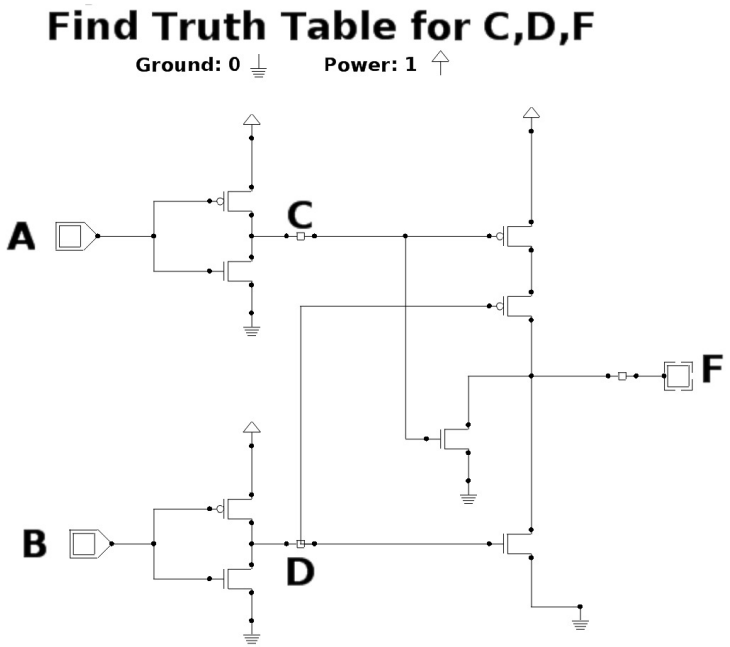
Circuits: Set1 – Page 3
Ques 1: What is the function D

- A,B are sent to a NOR gate (NOT OR). The output of the NOR gate is sent to a NOT gate. Therefore D = NOT (A NOR B)= A OR B

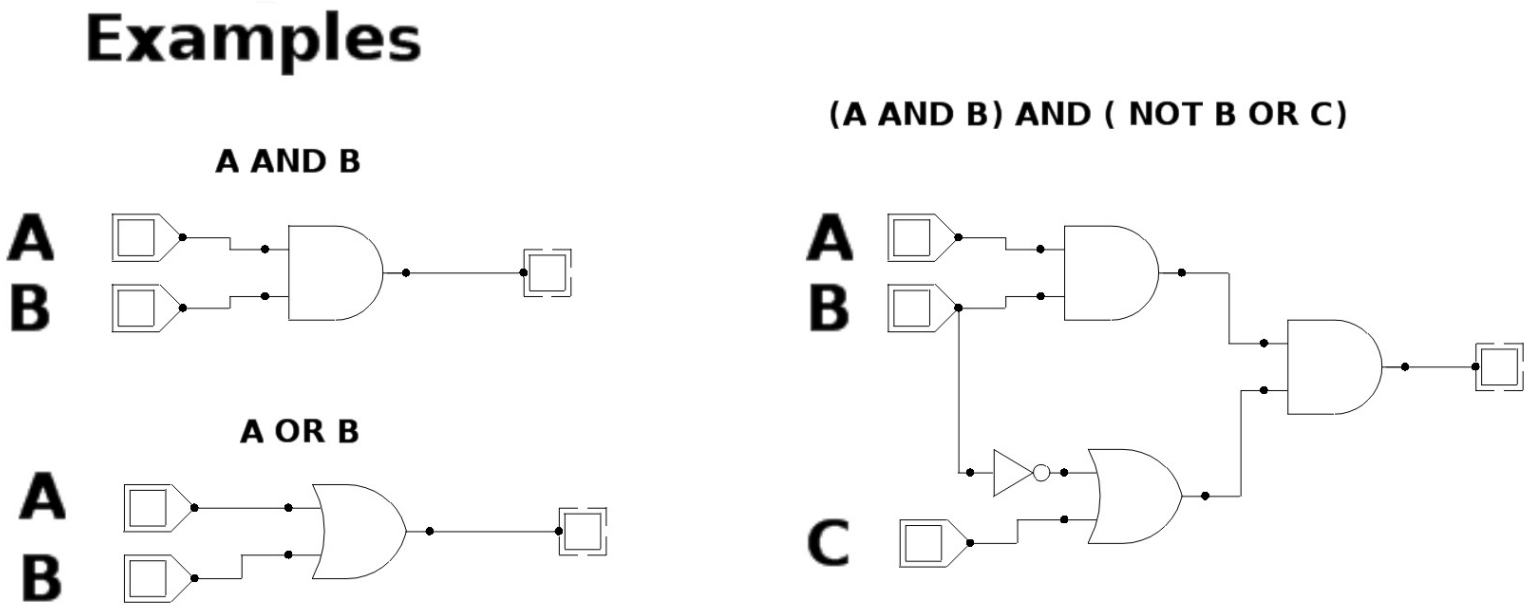


Circuits: Set1- Page 4
Ques.2: What is the function/gate F?

- A, B are each sent to NOT gates. Therefore C= NOT A and D= NOT B
- C,D are sent to NOR gate, therefore F = C NOR D= NOT (C OR D)= NOT((NOT A) OR (NOT B)). From DeMorgan's laws F = A AND B



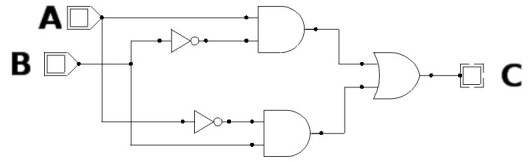
Circuits: Set1-Page 5
Examples of Boolean circuits and their functions



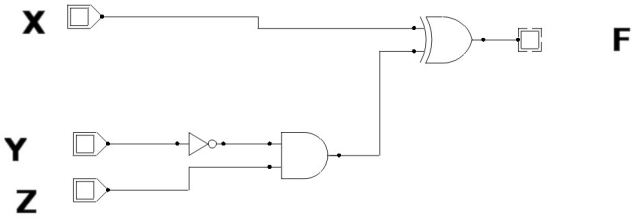
Circuits: Set1 – Page 6
Question 3: What are the functions implemented by each circuit ?

- Trace the circuit from C/F to its inputs (or the other way around)
- C = (A AND NOT B) OR (NOT A AND B) which is A XOR B
- F = X XOR (NOT Y AND Z)

(a) What is the boolean function for this circuit



(b) What is the boolean function F



Circuits: Question 4

- Design a circuit for

  F= (A AND (B XOR C)) OR (NOT C)

Draw circuit by hand…

Implement in CedarLogic after completing the remaining questions.

Circuits: Question 5

- Design circuit for Truth table shown here:
- Derive Boolean function first – submit
- Draw circuit –after completing remaining questions
- Implement in CedarLogic later

A	B	C	F
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

Circuits: Question 6

- Draw truth table for 1-bit full adder
- Three one bit Inputs (A, B, Carry-In)
- Two one bit Outputs (Sum, Carry-Out)
- See notes for full adder!

Circuits: Question 7

Your task if to design a system to help investors determine when to buy and sell stocks in the stock market – and you have identified some experts from whom to get input before buying or selling. The first expert is Pain Webster – a famous stock broker. The second export is Meg A Cash, a self-made billionaire in the stock market. The third expert is Madame Trelawney, world famous psychic. The fourth expert is Professor Lockhart. Before you recommend a decision (on buying a certain stock) you get input from all the experts. After receiving advice/input from all experts, and analyzing outcomes over several cases, you have come to the following conditions to implement your "expert system" to help investors buy stock.

a. Buy if Pain and Meg both say "yes" and the psychic says "no"
b. Buy if psychic says "yes" and professor says "no"
c. Buy if the psychic and the professor both say "no"
d. Don't buy in all other cases.

Construct the truth table for the above expert system, find the Boolean function to implement the system.