Review and supplement for Lecture 2.5
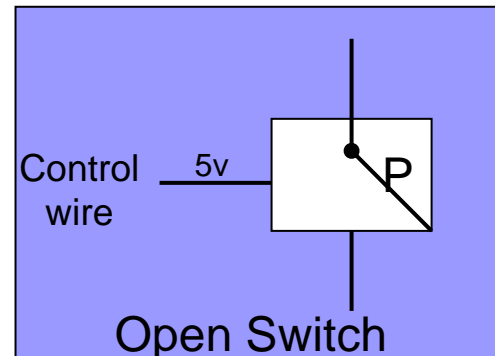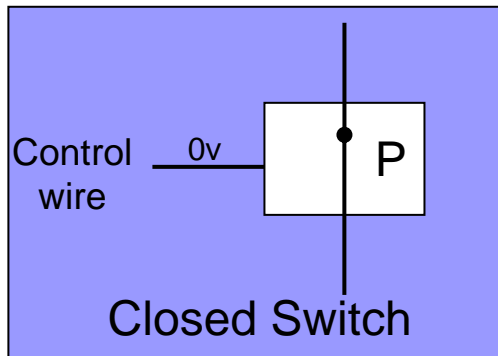
Transistors as switch

Control wire ___0v___ [P]	**PMOS transistor**
Closed Switch	
Control wire ___5v___ [P⟍]	
Open Switch	

Control wire ___0v___ [N⟍]	**NMOS transistor**
Open Switch	
Control wire ___5v___ [N]	
Closed Switch	

The simulation link

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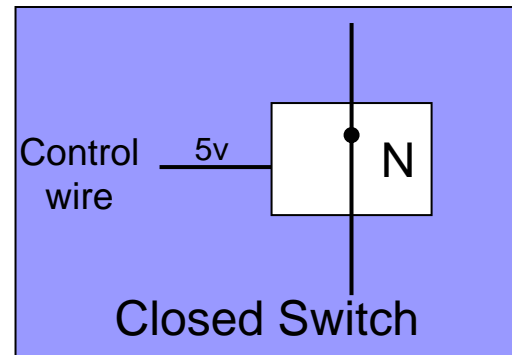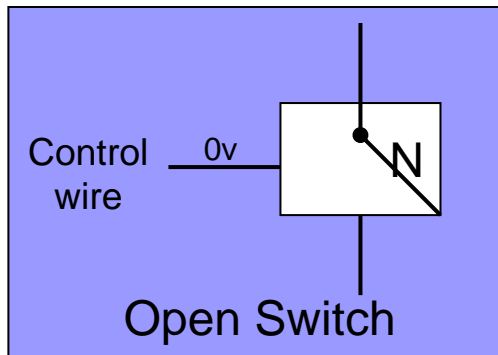
AND gate

Input1	Input2	AND output
0	0	0
0	1	0
1	0	0
1	1	1

Input1 —⌐
Input2 —⌐ Output

AND gate symbol

Power Supply (5V)

Input1 — 5V

Input2 — 5V — Output

N

N

P

P

Ground

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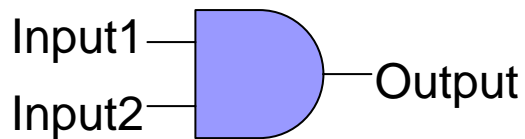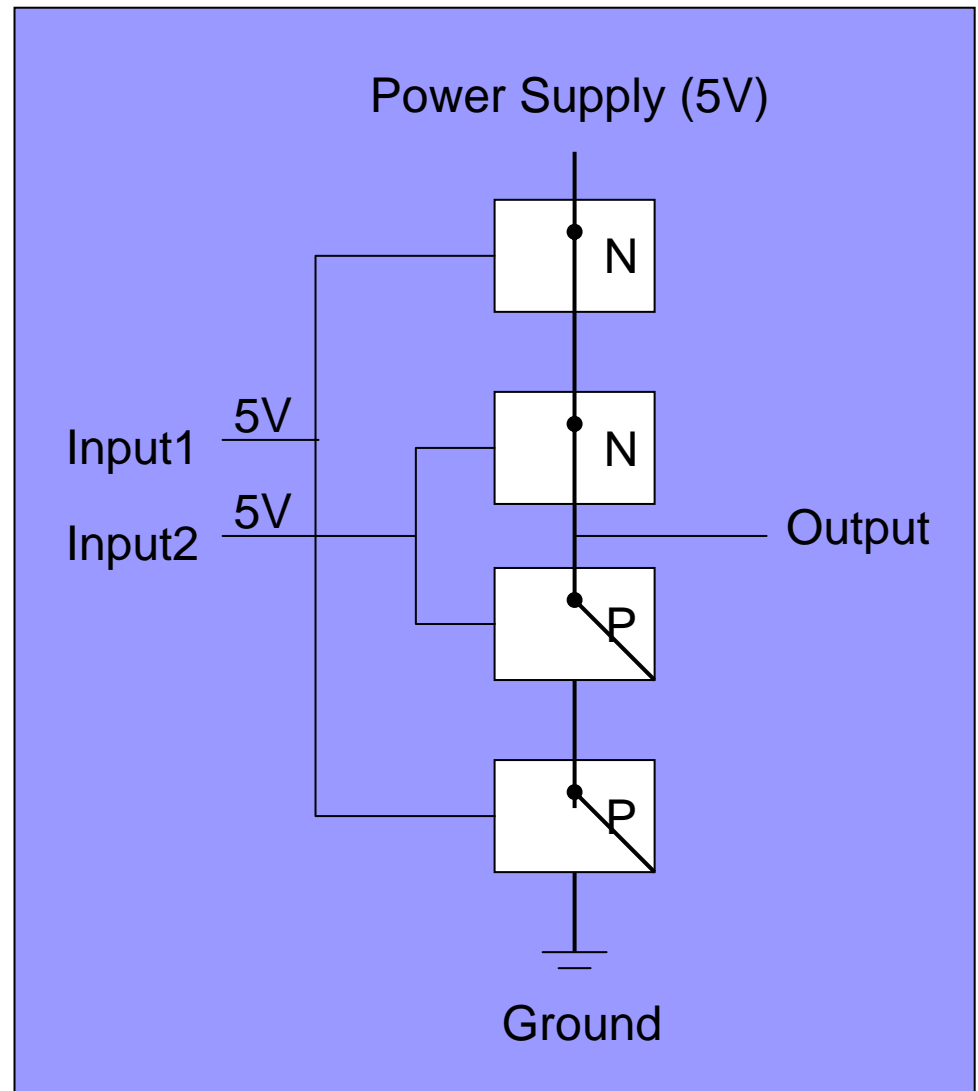
NOT gate and OR gate
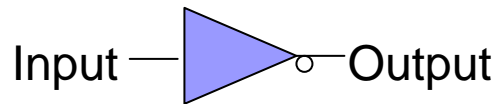
NOT gate symbol

Input	Not output
0	1
1	0
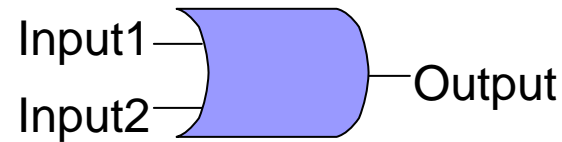
AND gate symbol

Input1	Input2	OR output
0	0	0
0	1	1
1	0	1
1	1	1

CPU and Main memory

Main Memory	
0	Load R0, 5
1	Load R1, 6
2	Add R2, R0, R1
3	STORE 7, R2
4	HALT
5	9
6	1
7	
…	…
255	

Control unit

registers	
R0	
R1	
R2	
R3	

A   B

C   Arithmetic logic unit (ALU)

+	C ← A + B
-	C ← A - B
&	C ← A & B
|	C ← A | B

Simulation 1(registers, ALU)
Simulation 2(registers, ALU, Memory)
Simulation 3(registers, ALU, Memory, Program)