ECE 574 | Lecture 1

Presentation

Moore's Law

Doubling of IC capacity every 18 months.

Increasing Abstraction

Higher abstraction levels simplify designer effort. High level synthesis allows us to describe systems in ways that are closer to human understanding.

Combinational Logic Design Process. | Truth Tables to Gates

Design a ROUNDER circuit with a 3-bit input A (represented as three inputs A2, A1, A0) and a 3-bit output R (represented as three outputs R2, R1, R0) where the output of the circuit is the input value A rounded up to the nearest multiple of 2. For example, if the input A is 5 `101`, the output R will be 6 `110`. If the input A is equal to 7 `111`, then the output should e 0 `000`. Draw the truth table and provide the Boolean equation for each of the three outputs.

Gray Code: The difference between any two values is just one bit.

A2	A1	A0	R2	R1	R0
0	0	0	0	0	0
0	0	1	0	1	0
0	1	0	0	1	0
0	1	1	1	0	0
1	0	0	1	0	0
1	0	1	1	1	0
1	0	0	1	1	0
1	1	1	0	0	0

	00	01	11	10
0	0	0	1	0
1	1	1	0	1

R2 = A2' A1 A0 + A2 A1' + A2 A0'

R1 = A1' A0 + A1 A0'