ECE 474a/574a – Computer-Aided Logic Design Exam 2 Notes

Boolean Algebra			
Commutative a + b = b + a a * b = b * a	Distributive a * (b + c) = a*b + a*c a + (b * c) = (a + b) * (a + c)	Associative (a + b) + c = a + (b + c) (a * b) * c = a * (b * c)	<i>Identity</i> 0 + a = a + 0 = a 1 * a = a * 1 = a
Complement a + a' = 1 a * a' = 0	Null Elements a + 1 = 1 a * 0 = 0	Idempotent Law a + a = a a * a = a	Involution (a')' = a

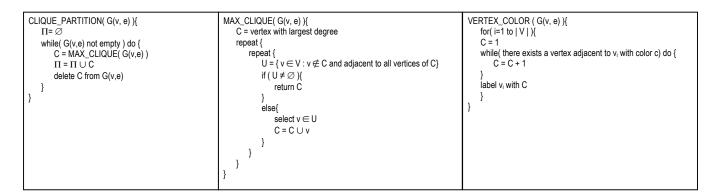
** you should know DeMorgan's Law

Convert SOP function to Complete Sum Methodology

- 1. Start with arbitrary SOP form
- 2. Add consensus pair of all terms not contained in any other term
- 3. Compare new terms with existing and among other new terms to see if any new consensus terms can be generated
- 4. Remove all terms contained in some other term

Repeat until no change occurs

 $CS(f) = ABS([x_1 + CS(f(0, x_2, ..., x_n))] \cdot [x_1' + CS(f(1, x_2, ..., x_n))])$



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LEFT_EDGE(I){

L = sort(I) in ascending order to l_j

c = 0

while(L not empty) {

S = \emptyset

r = 0

while (\exists an s : s \in L and s is first element in L with l_s \ge r) {

S = S \cup {s}

r = r_s

remove s from L

}

c = c + 1

label elements of S with color c

}
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