

CS-472: Design Technologies for Integrated Systems

Exercise Problem Set 6

Date: 19/10/2023

Topics: Boolean operators, recursive paradigm (cf. slide set 8)

Problem 1

Given the Boolean function $F = \bar{a}\bar{c}d + \bar{a}cd + a\bar{b}\bar{c} + abc + ac$

- (a) Check if F is negative or positive unate in the variables a , b , c and d .
- (b) Is F negative or positive unate?

Problem 2

Given the Boolean function $G = \bar{a}\bar{b} + \bar{a}bc + \bar{a}b\bar{c}\bar{d} + ab\bar{c}d + a\bar{b} + abc$, compute:

- (a) The Boolean difference $\partial G / \partial a$.
- (b) The smoothing $S_a(G)$.
- (c) The consensus $C_a(G)$.

Problem 3

Given the Boolean function $H = \bar{a}d + ac + a\bar{b}\bar{c}$, use the positional cube notation and recursive paradigm to show if the following cubes are contained in H :

- (a) cd
- (b) ad