COE 561, Term 061

Digital System Design and Synthesis

HW# 2

Due date: Sunday, Nov. 26

Q.1. Consider the function $f(a,b,c,d) = \sum m(0,1,2,4,5,6,7,8,9,10,13,14,15)$.

(i) Compute the off-set using the recursive complementation procedure outlined in section 7.3.4

(ii) Compute all prime implicants of ***f*** using the method outlined in section 7.3.4.

(iii) Apply the EXPAND procedure on the given cover using Espresso heuristics and show the obtained expanded cover. Compare your solution with the result obtained by ESPRESSO tool.

(iv) Apply the IRREDUNDANT procedure on the expanded cover using Espresso heuristics and show the obtained irredundant cover. Compare your solution with the result obtained by ESPRESSO tool.

(v) Determine if any of the obtained prime implicants is an essential prime implicant or not using the method outlined in section 7.4.4. If it is essential, remove it from the cover and make the on-sets covered by it don't cares.

(vi) Apply the REDUCE procedure on the irredundant cover using Espresso heuristics and show the obtained reduced cover. Compare your solution with the result obtained by ESPRESSO tool.

(vii) Apply the EXPAND procedure again on the obtained reduced cover using Espresso heuristics and show the obtained expanded cover. Compare your solution with the result obtained by ESPRESSO tool.

(viii) Model the given function in Verilog or VHDL, optimize it using Design Compiler and compare the obtained solution to your solution and the solution obtained by espresso tool.