

EE 705: VLSI DESIGN LAB 2025

ASSIGNMENT-1

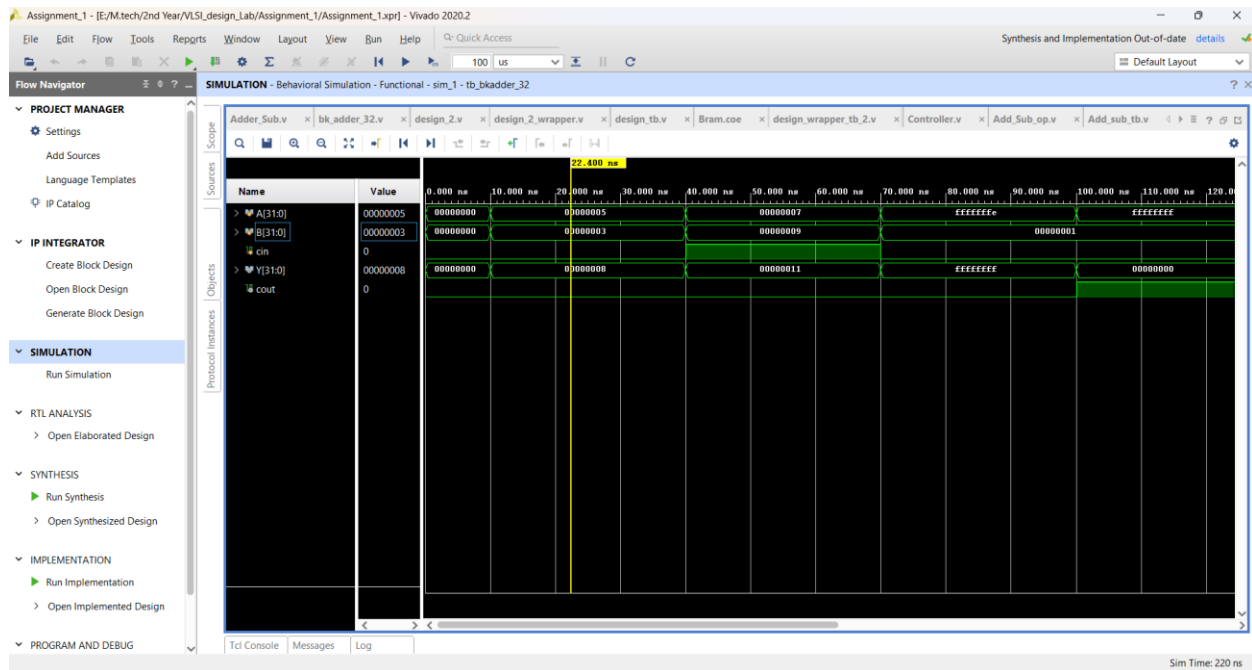
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Task-1

1. Brent Kung adder Output:

(hexadecimal format)



Note : Y is Sum

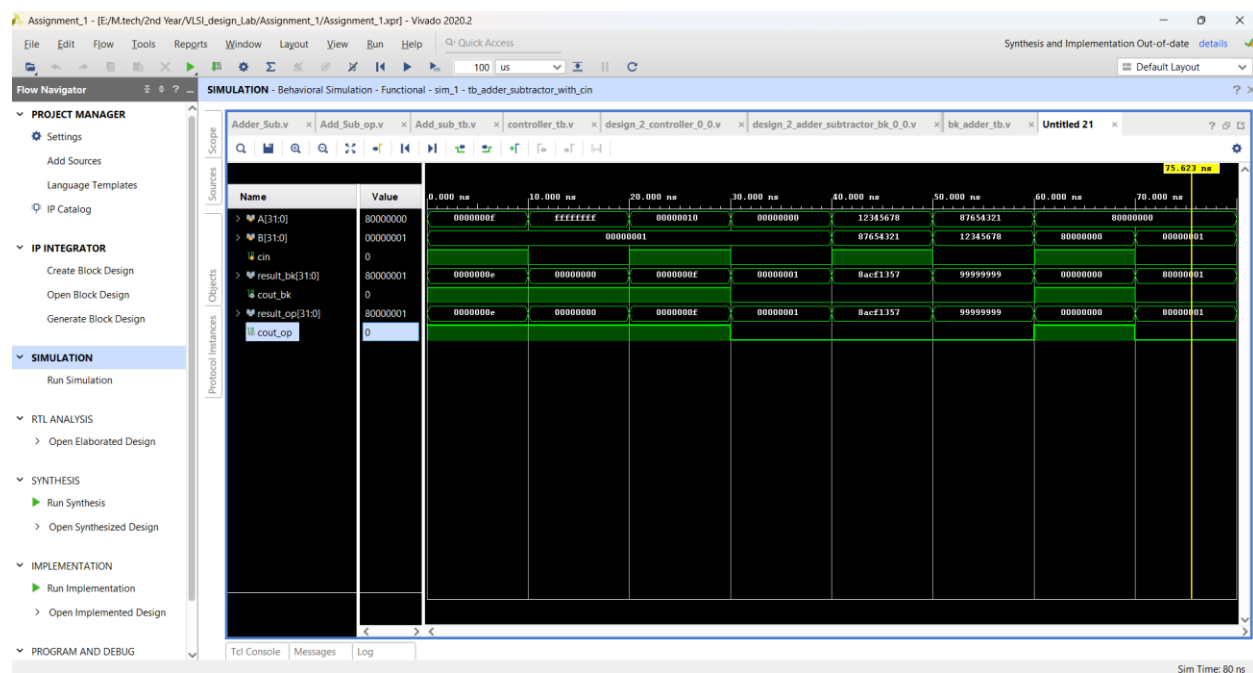
2. Adder/Subtractor module output using 2 methods:

when cin=0,[Addition(A+B)]

when cin=1,[Subtraction using Addition (A+B's compliment)]

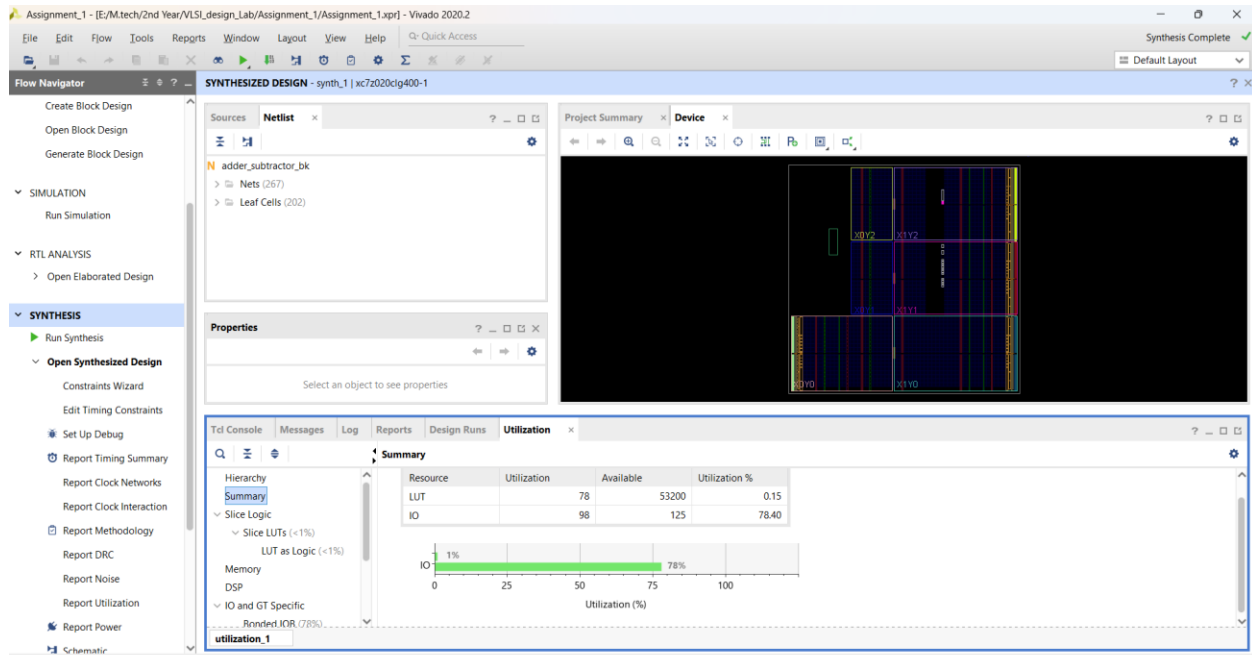
(a) Using Brent-Kung adder (sum=result_bk, cout=cout_bk)

(b) Using + operator only. (sum=result_op, cout=cout_op)

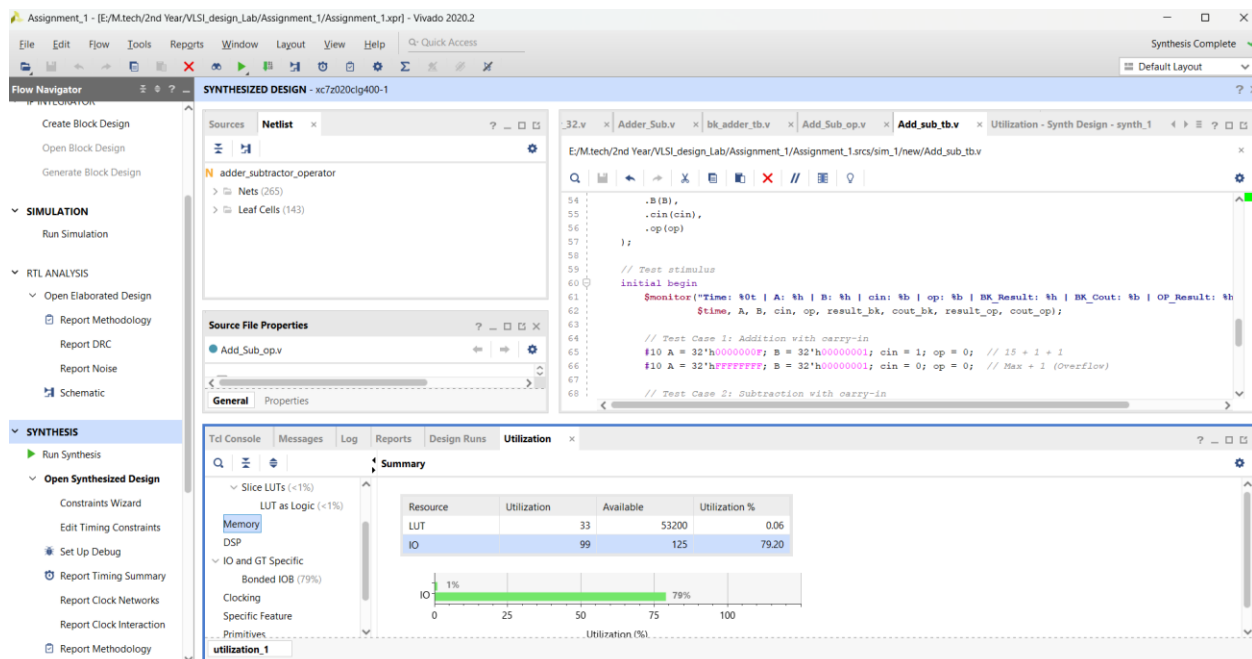


Note : I have used single Testbench to Test both Adder_subtractor circuit for better analysis and used cin in adder/sub circuit to determine when to add or sub but in controller code or block diagram I have used Add_sub pin to do that.

3.Utilization



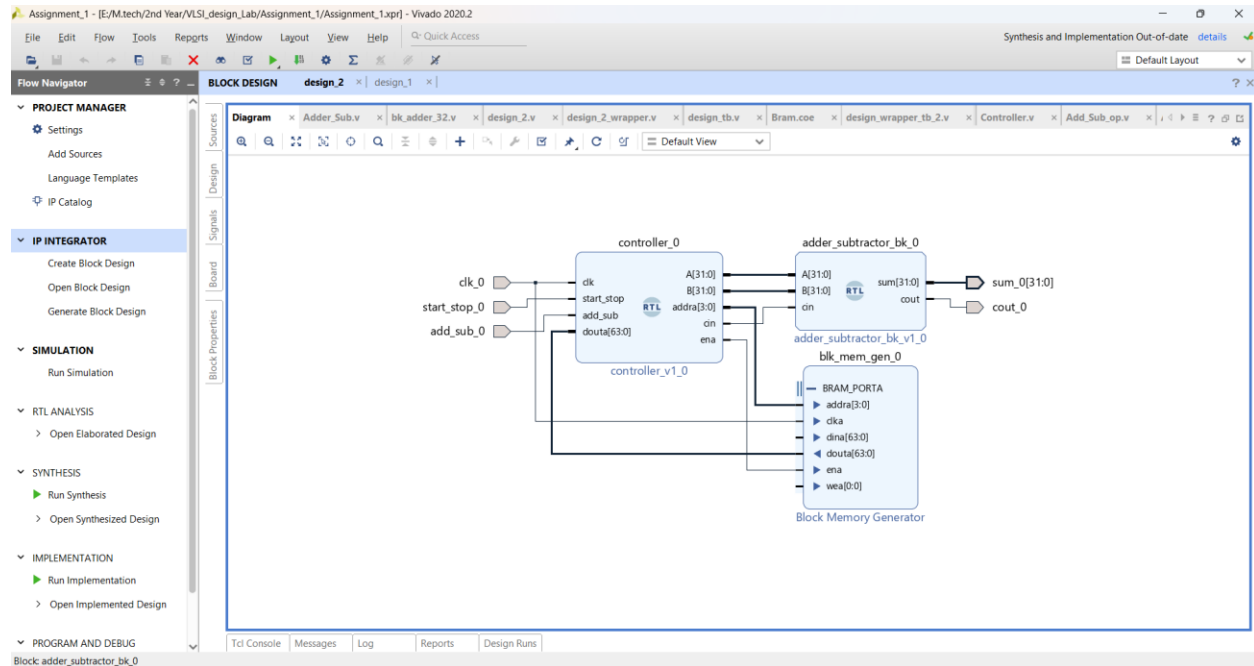
i). Adder/Subtractor module using Brent-Kung adder



ii). Adder/Subtractor module using + operator

Task-2

1. Controller operation with BRAM and Adder

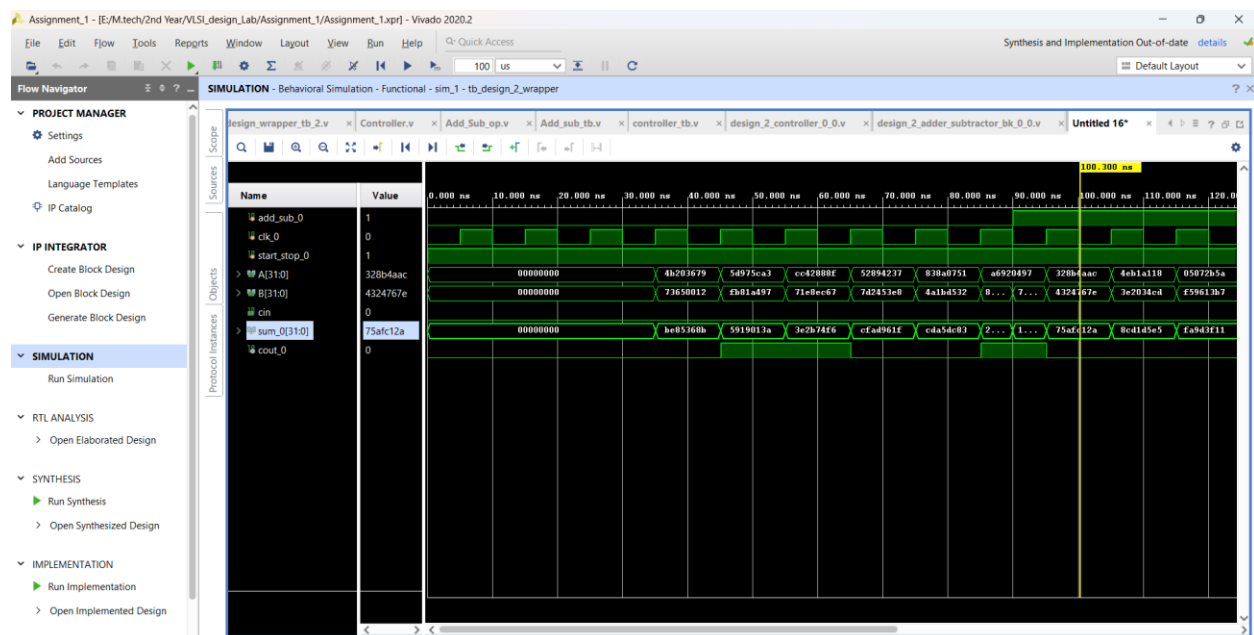


Outputs:

add_sub = 0, Addition is performed(A+B)

Add_sub=1, Substraction is done which itself is addition with 2's compliment of B.

Radix: Hexadecimal format



2.Full Block design diagram

