



BVLSI Course Project Report

Title of Project – Program Counter

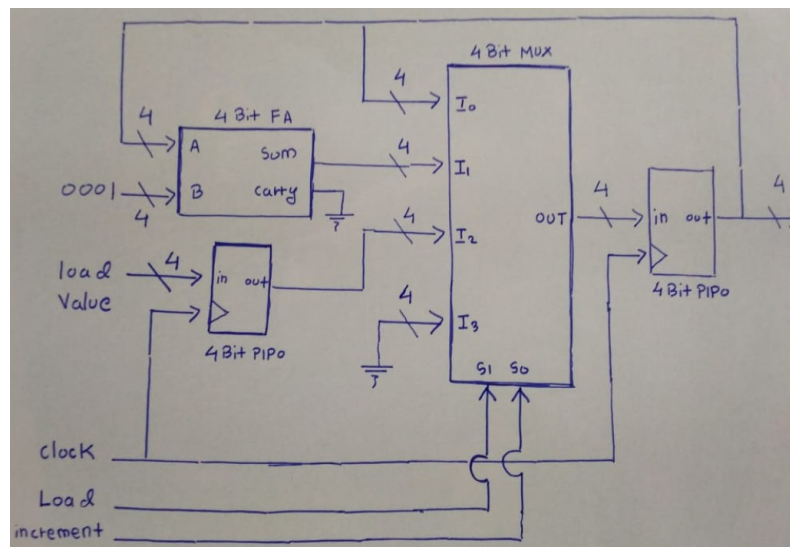
Mentor – Mr. Yogesh Pandit

Group Number	Name	Roll Number
5	Vansh Dhoka	5
	Atharva Godkar	31
	Anish Godse	32
	Sukanya Pingle	47

Introduction -

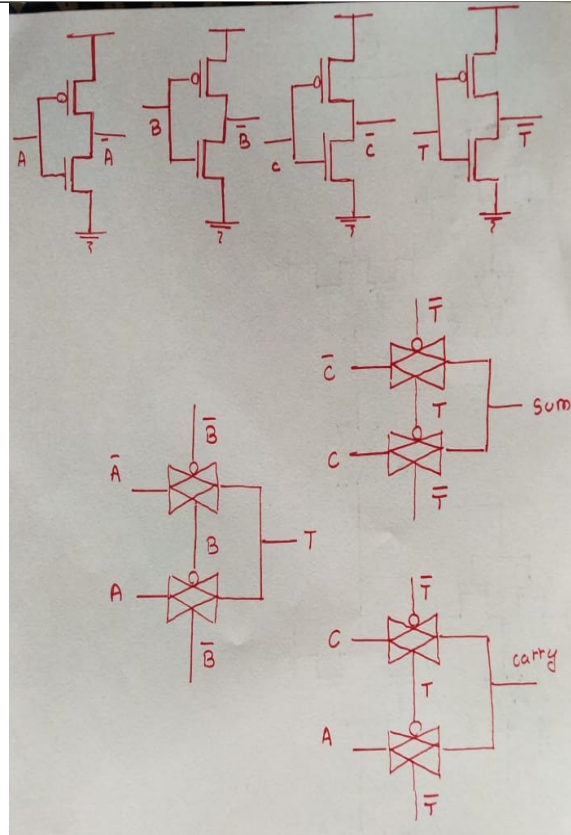
Program Counter is very important part of any microprocessor or microcontroller. Its job is the store the address of next instruction to be executed. It is basically a combination of up counter and PIPO register. For general instruction, PC simply increase the count by 1 after every instruction gets executed. For Branch instructions the PC directly loads the address of next instruction to be executed. These are the 2 modes of operation of a PC. These 2 modes are selected using 2 control signals i.e increment & load. We have used cadence virtuoso tool to design PC. We have adopted **bottom to top design methodology** for completing this project. For eg. We first built 1bit adder, followed by 4bit adder, and then finally complete PC. We have **Transmission Gate design style** for making PC. We are making **4 bit PC** (range = 0 to 15).

Circuit Diagram -

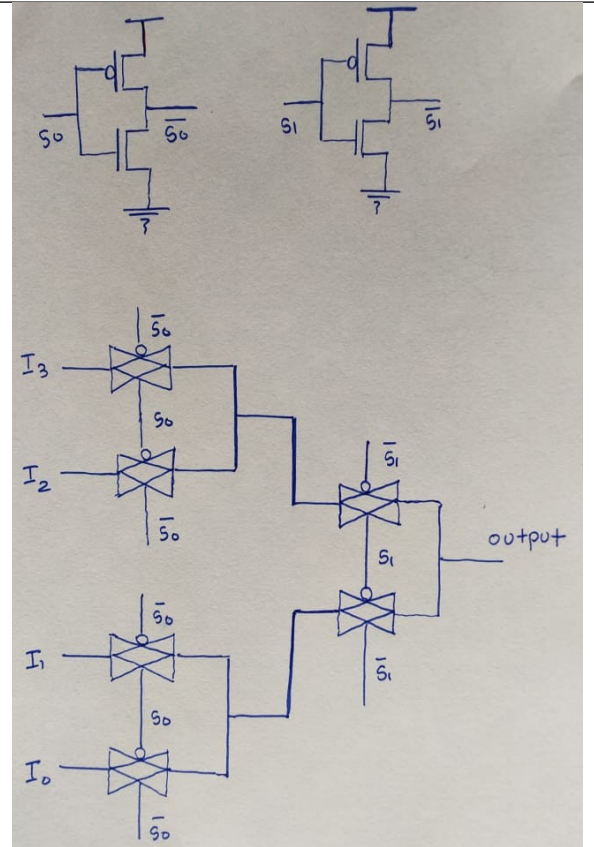




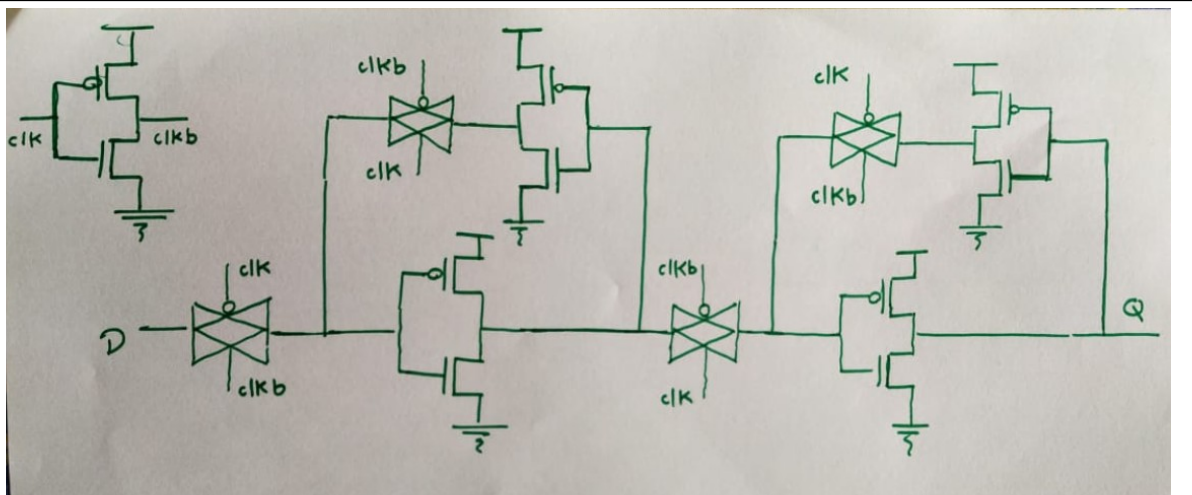
1bit adder circuit diagram



1bit mux circuit diagram



D flip flop circuit diagram



Digital circuit	Transmission gate style	Static CMOS style
1 bit adder	20 MOSFETS	46 MOSFETS
1bit mux	16 MOSFETS	70 MOSFETS
D flip flop	18 MOSFETS	18 MOSFETS

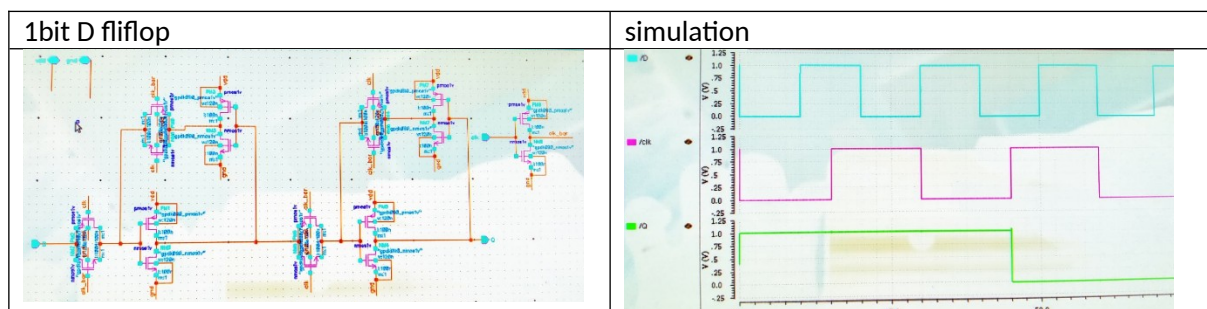
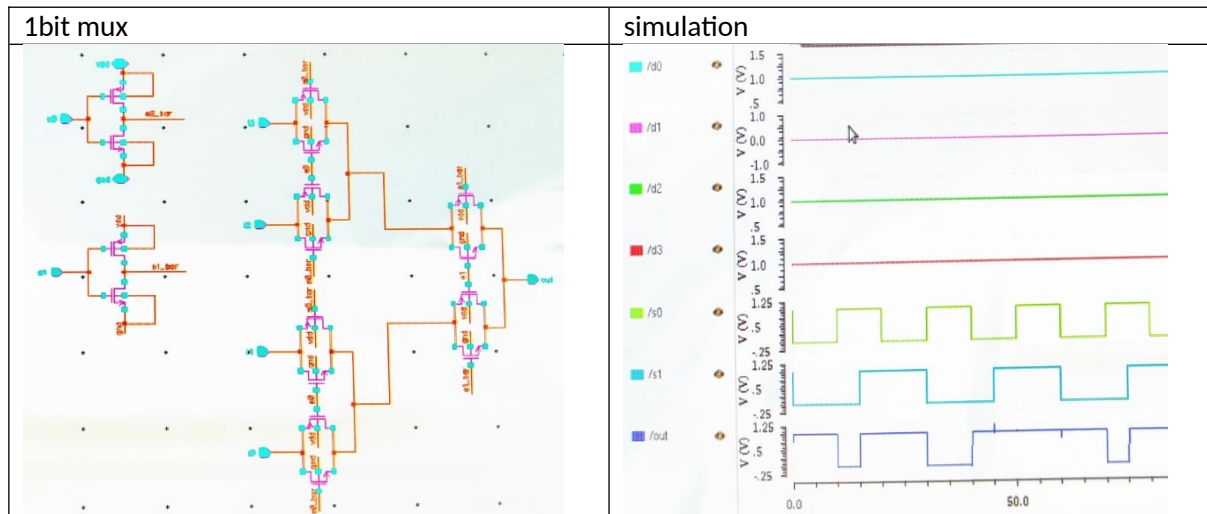
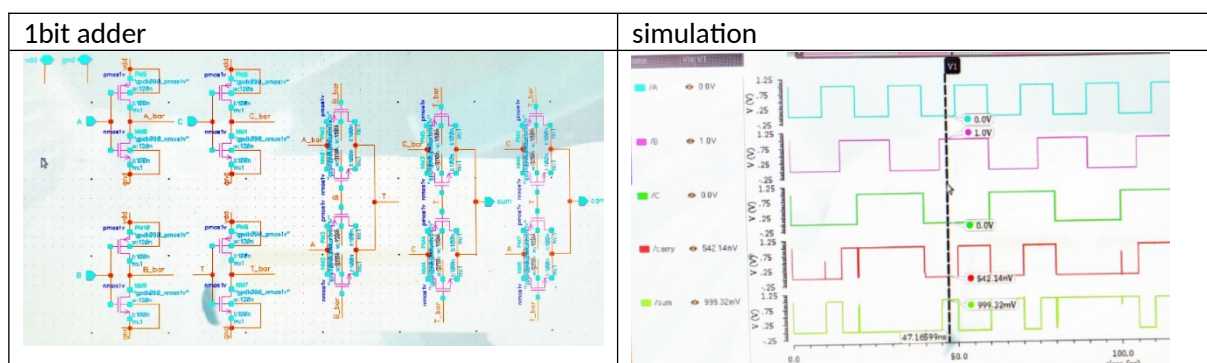
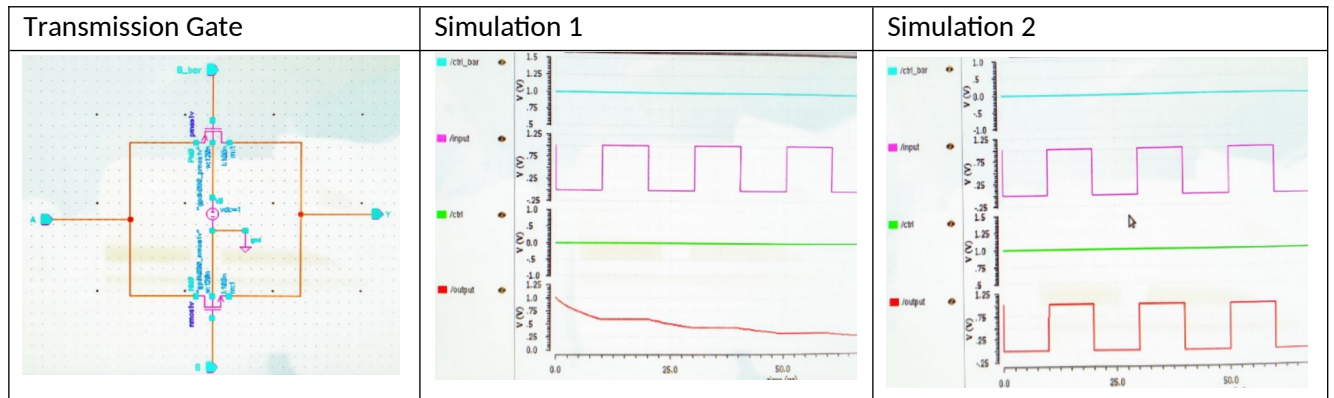


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Department of Electronics

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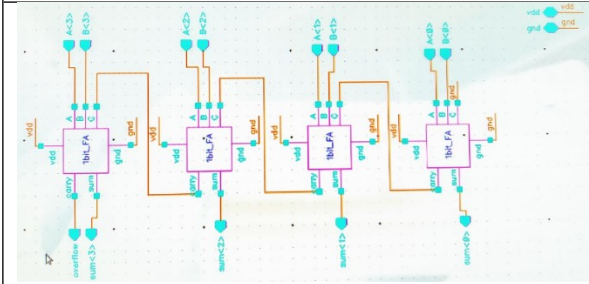
Result & Conclusion -



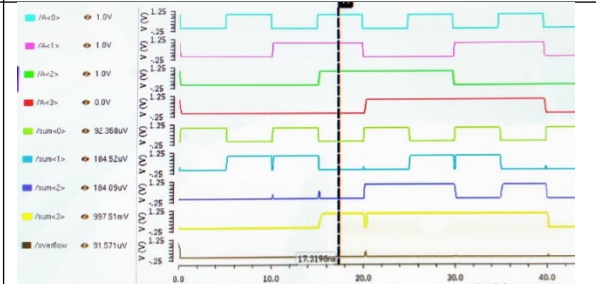


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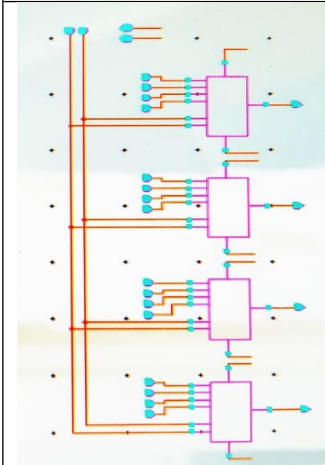
4bit adder



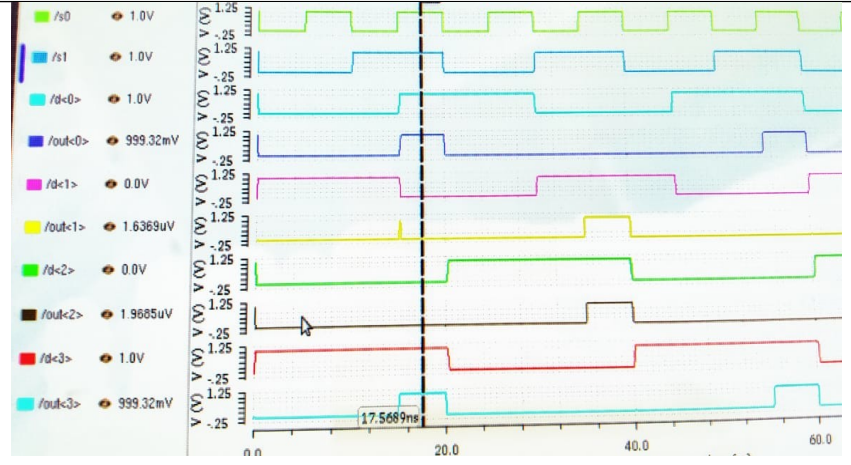
simulation



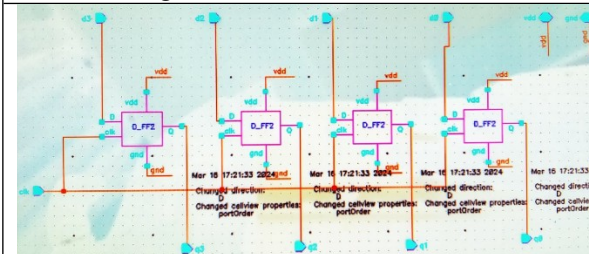
4bit mux



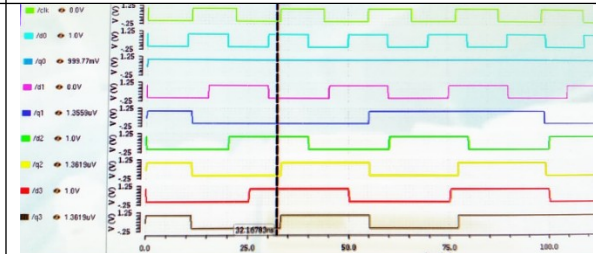
simulation



4bit PIPO register

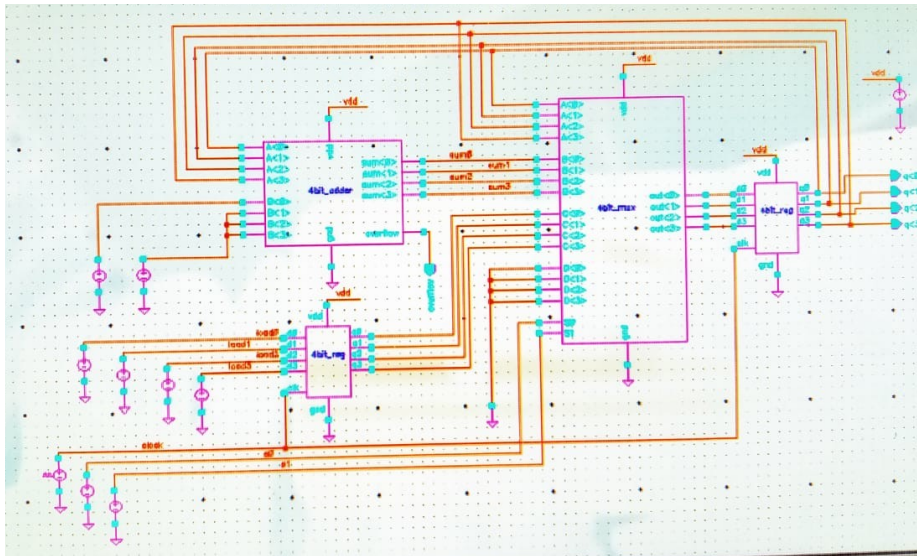


simulation

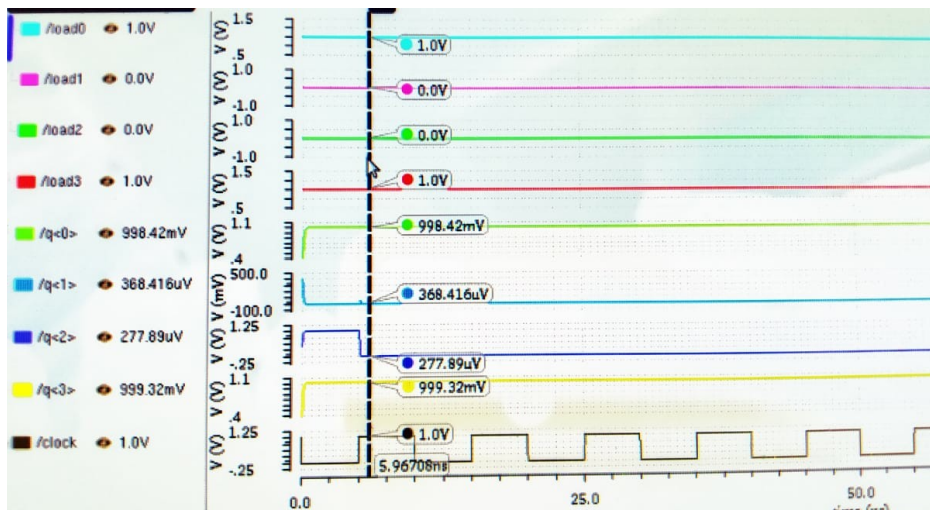




4bit program counter



Simulation when load = 1 & increment = 0



Simulation when load = 0 & increment = 1

