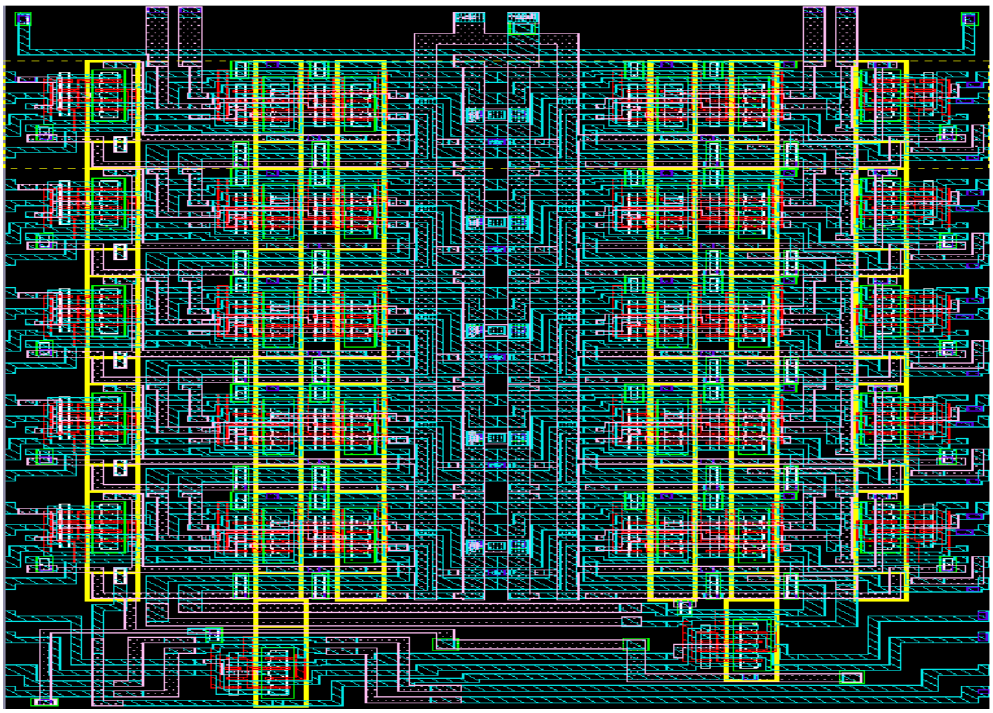
DIGITAL LOGIC DESIGN



Lab Manual – 06

Topics:

1. Understanding and designing half and full Subtractors
2. Designing Full Subtractors using Half Subtractors
3. Designing multi-bit Subtractors using Full Subtractors

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1) Understanding and designing half and full Subtractors:

Lab Task:

Draw truth tables and circuit diagrams of Half and Full Subtractors and implement them.

- Implement by using AND and OR gates only.
- Implement using XOR, AND and OR gates.

2) Implementing Full Subtractor Using Half Subtractors:

Home Task:

You are provided with two half Subtractors. Implement a full Subtractor using them (and some extra circuitry if required)

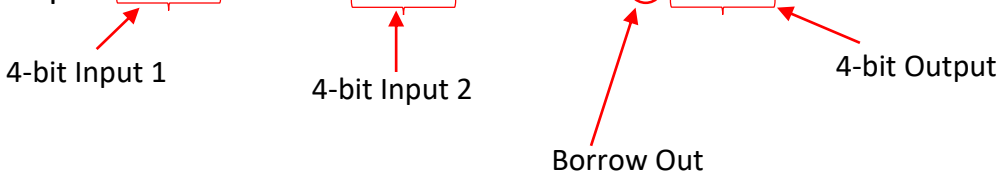
3) Implementing Multi-bit Subtractors using full Subtractors:

Home Task:

You are provided with four full Subtractors. Implement a 4-bit Subtractor using them.

Hint: A 4-bit Subtractor will have 4+4 inputs, 4 S-out and a Cary out.

Example: 0 0 1 0 - 1 0 0 1 = 1 1 0 0 1



Note: Draw Block Diagrams only for home tasks.

Instructions:

- **Show your work:** Make sure you have shown your work to respective TA in the lab before leaving it.
- **Clean Up Workspace:** Ensure your workstation is clean and organized. Clear away any papers, or materials used during the lab session.
- **Turn Off Equipment:** Power down all equipment.
- **Secure Components:** Place all physical components such as wires, ICs at their designated places. Do not leave components lying around on the workbench.
- **Return Borrowed Equipment:** Return the ICs and other equipment taken from server room.
- **Save Work:** Follow the instruction given in the lab regarding saving your work.
- **Dispose of Waste:** Dispose of any non-recyclable items, in the designated waste bins. Recycle any recyclable materials according to lab guidelines.
- Follow any additional instructions provided by the lab instructor or TAs regarding lab cleanup and departure procedure.
- Do the home task on sheets, make a pdf and submit it in the Google Classroom. The name of your file must be YourRollNumber_HTLab06.pdf. (i.e. BCSF23M5XX_HTLab06.pdf/ BSDSF23XXXX_HTLab06.pdf).

  Also submit Hard copies in the next lab.