Exp#1

Prototyping of Logic Circuits using Discrete Components

COE203
Digital Logic Laboratory

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COE - KFUPM
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Integrated Circuits

- Implement logic gates (AND, OR, etc)
- Built with transistors
- Binary logic (0/1)
- Different packaging/sizes
74xx Series

• Family of ICs:
  – Logic gates (NAND, NOR, etc)
  – Flip-flops
  – counters

• Name: 74xx or 74xxx

• Letters for manufacturer and technology
  – SN74ALS245
74xx Series

- TTL Book provides data sheets for ICs.
  - pin configuration
  - function
- Transistor-Transistor Logic
- High logic level = 5V
- Low logic level = 0V
IC Numberings

- PINs are numbered in a circular fashion
- Notice the notch (dot)
7400 (Quad 2-NAND)

- 4 2-input NANDs
- \( V_{cc} = 5V \)
- \( GND = 0V \)
- Numbering
  - (1-14)
Breadboarding

Each row of 5 holes forms one node, i.e. the five holes are electrically connected.
Breadboarding

Src: http://www.iguanalabs.com/breadboard.htm
Old-style breadboard

Src: http://www.qsl.net/ab0cw/
Today's Experiment

• Build a 1-bit Full-Adder
• Use suitable ICs

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