EECS 140 Lab 12
Implementing a SOP Expression on Prototyping board

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Recap last lab

• Installed the following circuits
  – power input
  – Input switch
  – Output LED display

• Performed first board test
  – The LED display components are negative logic
Bypass capacitors

- Used to prevent IC damage due to voltage fluctuations
- $C=0.01$ micro farad
Install Bypass capacitors

- Unpolarized capacitors; orientation does not matter
- Solder 6 bypass capacitors C2-C7
IC sockets

- Six units of 16-pin IC sockets
Install IC sockets

- Notch on socket should face bypass capacitor
- Solder six IC sockets
7400 series ICs

- All these are 14-pin devices and should be inserted close to the bypass caps.
- There will be two open socket pins away from the bypass cap.
Install ICs into sockets

- 74LS04 (hex inverters) in the bottom sockets
- 74LS21 (AND gates) in the middle row
- 74LS32 (OR gates) in the top left socket
- Cut out in the IC should face the bypass capacitors
Power and ground bus

• Cut two units of 25 pins each from your header strip.
Install power and ground bus

- Insert 25-pin headers and when firmly in place, solder
- The power bus will be used to provide Vcc to ICs or logic ‘1’ level
- The ground bus will be used to ground the ICs or logic ‘0’ level
IC connection header

• Cut twelve units of 8 pins each from header strip
Install IC connection headers

- Install all 12 IC connection headers (just one shown)
Interconnection headers

• Cut three units of 5 pins each from header strip
Install interconnection headers

- Used to duplicate IC pins
Implement SOP expression

• Write an arbitrary SOP expression with a maximum of four inputs
• Use the switch circuit to provide input
• Use LED display for output
• Use connection wires to form the desired logic circuit
• Use IC data sheet attached on lab wiki for pin out information
• Test your design by going through the truth-table for your expression