Lessons from Project 1

• No parts available on weekend before demo
• Don’t underestimate integration step
• Complete sub-components as you go along
• Rehearse presentation
• Report written by person who did the work
• Team management
  – Meetings Tues/Wed

Project #2

Teams
• Same Teams
• New Responsibilities

Equipment / Supplies
• DE2 Board
• Additional 50g 3D Printer Material (150g total)
• PCB Quota (9cm x 12 cm)
  – mandatory
Project #2 In a Nutshell

• Turn your Project #1 into an Oscilloscope
  – Single trace
  – Variable volts / div adjustment
  – Variable time / div adjustment
  – Trigger on rising slope (set voltage)
  – Displays sine, square & triangle
    • use signal generator
  – Improve deficiencies in existing design
    • or discard your design altogether (not recommended)

PCB Guidelines

• 1 board per team
• 9cm x 12cm maximum
• Submission Deadlines
  – Sunday Nov. 13 (10 pm)
  – Sunday Nov 20 (10 pm)
  – 1 week turnaround time
• Design Rules
  – Group Name in Subject of Email
  – Teardrops
  – Min. 1.5 mm spacing (pads / traces) on bottom layer
  – If incorrect, “Check Website” email is all you will get
PCB Production Flowchart

- Layout circuit
- Simulate circuit
- Correct Output? No
- Build circuit on breadboard
- Correct Output? No
- Layout PCB
- Submit drawing for review
- Submit Gerber files for production

Display

- Minimum 12 LEDs high
- PN: 350-1799-ND
Saturating Op-Amp

\[ V_{out} = \infty(V_+ - V_-) \]
\[ V_+ = V_{in}, \quad V_- = 0 \]
\[ V_{out} = \infty V_+ \]

A/D Converter (1-Bit)

\[ V_{out} = \infty(V_+ - V_-) \]
\[ V_+ = V_{in}, \quad V_- = V_{CC} \frac{R_2}{R_1 + R_2} \]
\[ V_{out} = \infty V_+ \]