HARDWARE 3:
VOTING MACHINES

DEMO RUBRIC

Wiring for this lab is much less complex than for hardware 2, meaning that it is reasonable for you to finish within the lab period. Whereas hardware 2 was more about large, complex designs and error checking, this lab is really just about understanding multiplexors. A LogicWorks mockup is not required, and in fact, it is my recommendation that you plan out your hardware design on paper instead. You will only need three chips for this design: two 74153s and a 74151.

Completion Requirements:

- ✓ Create valid tables for your 4-1 and 8-1 multiplexors.
- ✓ Hardware implementation. A "majority" is greater than ½. Note that a "dummy MUX" is just a switch that serves as an input to the 8-1, since we don't have enough switches to actually allow for 4 multiplexors.

REPORT RUBRIC

The report for this assignment is a bit lighter than most. You need only fill out the theory section, attach some tables in the deliverables, and explain how you found out what the pin-inputs to the multiplexor should be.

Scoring (out of 3 points):

- ✓ **[1.2 point]** Theory:
  - o **[0.6]** What is a multiplexor and why do we use them?
  - o **[0.6]** How is our voting machine implemented? Give an example of a case in which we can have a "majority" (the 8-1 multiplexor produces a positive output) without having a majority (at least 7 votes out of 12), as well as an example of a case in which the 8-1 MUX would not generate any output even though we have a majority.

- ✓ **[1.2 points]** Deliverables:
  - o **[0.4]** Include the implementation table for your 4-1 multiplexors and explain how both **f** and the **D0-D3** inputs were determined (see page 2 of instructions).
  - o **[0.8]** Include the table for your 8-1 MUX and explain how both **f** and the **D0-D7** inputs were determined.

- ✓ **[0.6 points]** Discussion section. Should conform to standard lab report guidelines.
- ✓ **[No points]** Questions: There are no questions for this lab.