Introduction to CMOS VLSI Design (E158)

Problem Set 1

Harris

THE MOTIVATION FAIRY

IF YOU WORK HARD, YOU WILL GAIN THE RESPECT OF YOUR PEERS.

IF I AVOID THE STRESS OF HARD WORK, I WILL OUT-LIVE MY PEERS.

HARD WORK CAN KILL ME?

IF YOU'RE LUCKY.

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1) Schematics and stick diagrams

    (a) Draw a schematic for an AND-OR-INVERT (AOI) gate computing
           `y = ~(a & b | c).`
    (b) Sketch a stick diagram for the AOI gate.
    (c) Based on the stick diagram, estimate the minimum width and height of the cell.

2) Layout cross-section

Figure 1.35 shows the top view of an inverter with a cutline, and Figure 1.34 shows the side view of a cross-section taken along this cutline. Draw the cross-section along the dashed cutline for the NAND gate from Figure 1.74.

3) Please indicate how many hours you spent on this problem set. This will not affect your grade, but will be helpful for calibrating the workload for the future.