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COE 360, Principles of VLSI Design, Term 981
Quiz# 4

Date: Wednesday, Dec. 2

- (I) Draw the stick diagram layout of the following gate using the transistor-level implementation that directly corresponds to the equation given. Minimize the wire lengths and the contact cuts used.

$$Y = [(A + B)' \cdot C \cdot D]'$$

(II) Given the layout shown below, do the following:

- (i) Extract the transistor-level implementation from the layout and determine the function that it implements.
- (ii) Calculate the channel resistance of the n- and p-transistors. Assume that the sheet resistance of the p-channel equals to $15 \times 10^3 \Omega/SQ$, and that of the n-channel equals to $6 \times 10^3 \Omega/SQ$. Assume that the value of the resistance of a corner square is equal to 0.66 the normal square resistance.
- (iii) Show the polysilicon, p-diffusion, n-diffusion, and metal masks for this layout.



