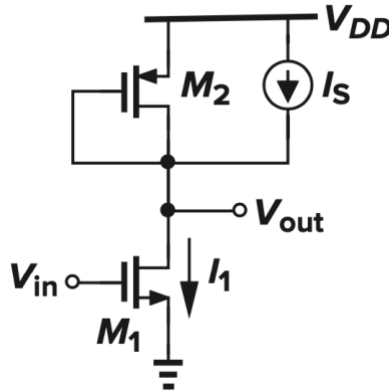
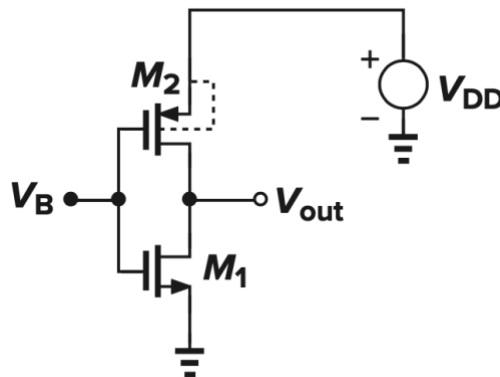


EE-320 Exercise 4

1. In the circuit shown below, M_1 is biased in saturation with a drain current equal to I_1 . The current source $I_S = 0.75I_1$ is added to the circuit. Derive the gain equation in terms of overdrive voltages of M_1 and M_2 . Assume $\lambda = 0$.



2. Assume V_B is a bias voltage to place M_1 and M_2 in saturation. Find the small-signal gain from V_{DD} to V_{out} , which represents the sensitivity of a CS stage with active load to supply voltage ($\lambda \neq 0$).



3. Find the impedance seen looking into the source (R_X), if $\lambda = 0$, $\gamma \neq 0$. Repeat the calculation for $\lambda = \gamma = 0$.

