Lecture 12 -- MOS Amplifiers and Review

A handy table of amplifier properties.

Amp	Rin	Rout	Av
CE	r_π	$r_o \| \| R_C \approx R_C$	$-g_m R_C$
CE w/ degen (neglects r_o)	$r_\pi + (\beta+1)(R_E \| \| r_o) \approx \beta R_E$	R_C	$\frac{\beta R_C}{r_\pi + (\beta+1)(R_E \| \| r_o)} \approx \frac{R_C}{R_E}$
EF	$r_\pi + (\beta+1)(R_E \| \| r_o) \approx \beta R_E$	$r_o \| \| R_E \| \| (1/g_m + R_S/\beta) \approx 1/g_m$	$\frac{(\beta+1)(R_E \| \| r_o)}{r_\pi + (\beta+1)(R_E \| \| r_o)} \approx 1$
CB (neglects r_o)	$r_\pi \| \| 1/g_m \approx 1/g_m$	R_C	$g_m R_C$

What is the total voltage gain of two identical amplifiers with Rin=Rout and a gain of 20dB? Express in both linear and dB scale.

Derive the gm and ro of a MOSFET

What is an easy way to take biasing networks into account when calculating input impedance?

Draw two common structures we need to analyze when looking at amplifiers.

What are Rin, Rout and Av of a source degenerated common source amplifier. Why is it uncommon to use it?

What are Rin, Rout and Av of a source follower?

What are Rin, Rout and Av of a common gate amplifier?