今天需要用到兩台power supply，請同學跟
對面的組的同學合作，使用兩台電源供應器，
請將兩個接地端接在一起

電線的正式名稱是單蕊線

陶瓷電容0.1u=104=10x10^4pF

dc coupling：輸出訊號可以觀察到dc值

ac coupling：輸出訊號不能觀察到dc值，僅ac值
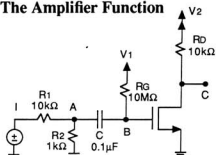
E3.0 The Amplifier Function

Figure 8.6 A Simple Grounded-Source Amplifier Topology

The voltage V_1 is a dc supply whose role it is to adjust the dc component of v_{GS} and hence the dc value of i_D. The voltage V_2 is a dc supply with which one can control the dc value of v_{DS}, once the value of I_D is established.

E3.1 Device Transconductance

- Assemble the circuit of Fig. 8.6 using the 345 NFET (the one whose pins are 3,4,5) with substrates connected to ground and to V_2 appropriately. Adjust the signal generator for zero output. With $V_2 = 6$ V, adjust V_1 until $V_C = 5$ V. Measure V_1

- Now, apply a 1 Vpp sine wave at 1 kHz to I, while displaying the voltages at nodes A and C on your oscilloscope. Use ac coupling on the channel connected to node C (for these early measurements). Find the voltage gain from node A to node C. Under the assumption that $A_v = g_m R_D$, estimate g_m.

- Now, with an input signal of zero, raise V_2 to +15 V, and V_1 until $V_C = 5$ V. Measure V_1

- Now, with a 1 Vpp sine wave at 1 kHz at node I, display and measure the signals on nodes A and C. What is the voltage gain from node A to node C? Estimate g_m.

E3.2 Signal Distortion

- With a single transistor in use in the circuit of Fig. 8.6, $V_2 = 15$ V and V_1 adjusted so $V_C = 5$ V, apply a 0.1 Vpp triangle wave at 1 kHz to node I.

- Now, measure nodes A and C, with the oscilloscope channel connected to node C set to ac coupling, and that on node A for signal inversion.

- Now, raise the generator output level, until the node C distordted. Please draw it.

- Switch the node-C channel to dc coupling and measure the dc values of the peaks of the triangle waveform.

- Now, while watching the direct-coupled output on node C carefully, lower the voltage V_2, what happened for Vc

** set V2=10V, lower signal generator to let Vc not be distorted. What Vi will be ?

今天做最慢的一組，需要留下來打掃lab，請同學加油吧。