Reverse Classroom: Op Amps Quiz 1

REV 0; August 18, 2019

1 Using an Op Amp in Open Loop Mode

We can model an operational amplifier as follows:

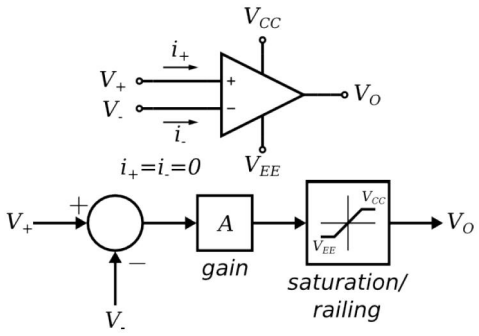

Figure 1: Model of an Operational Amplifier

The op amp has an output voltage that proportional to the difference between the inputs: $V_O = A*(V_+ - V_-)$, The "open loop gain" (A) is usually a fairly large value.

However, V_O cannot be more than than V_{CC} or less than V_{EE}. That is, the output is constrained by the power supply rails. When the output is limited by the supply voltages, we often say the op amp is "saturated" or "railing."

1.1 Design

Assume you have the following circuit:

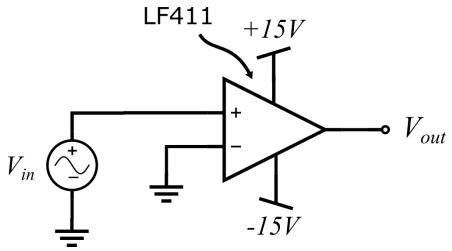

Figure 2: An Operational Amplifier Circuit

The LF411 op amp has a typical open loop gain of 200,000. What is the maximum peak-to-peak input voltage V_{in} you can apply in this circuit without causing the output voltage V_{out} to be clipped?

Now complete Lab 6 through part 6L.2