Reverse Classroom: Op Amps Quiz 4

REV 0; August 18, 2019

1 Using an Op Amp to Undo the Dog

Just a reminder:

Perfect Op Amp Design Rules

1. No current flows into or out of the inputs (V_- and V_+) of an op amp.
2. If there is negative feedback, the op amp keeps the negative input at the same voltage as the positive input, so you can assume that $V_- = V_+$.
3. The inputs of an op amp should always be kept between V_{CC} and V_{EE} (i.e., $V_{EE} \leq V_-, V_+ \leq V_{CC}$).
4. The output of an op amp cannot be greater than V_{CC} or less than V_{EE}.

1.1 Design

Assume you have the following circuit:

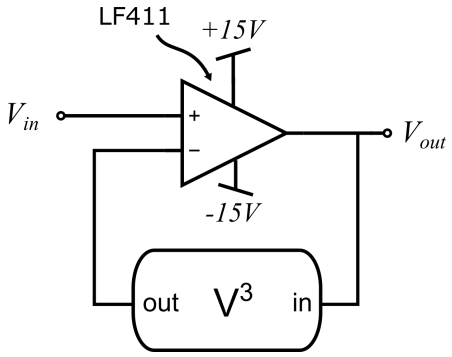

Figure 1: An Operational Amplifier Circuit

The block in the feedback loop takes the input voltage ("in") and cubes it (so the voltage marked "out" is the output voltage of the op amp cubed).

Use the op amp design rules to determine V_{out} as a function of V_{in}.

1.2 Contemplation

What does this problem have to do with "Undoing the dog?"

1.3 More Contemplation

Why do you think I chose V^3 for the feedback function rather than V^2?

Now complete the rest of Lab 6. Note that the second half of part 6L.9 requires and analog scope so if you plan to do this experiment let us know so we can set you up with one.