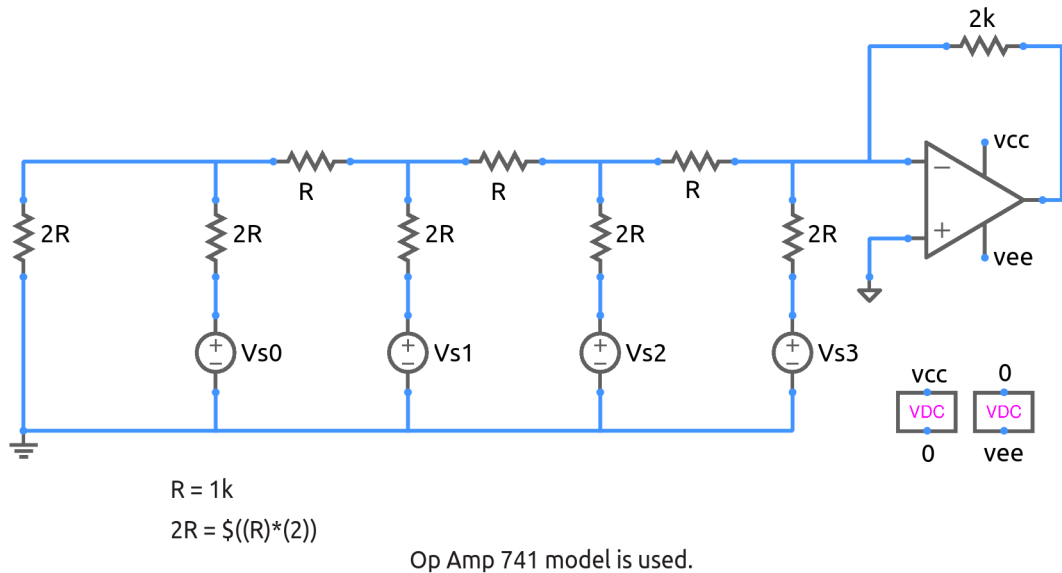


ee101_network_3a.sqproj



The figure shows a digital-to-analog converter based on the $R-2R$ ladder network. Each source voltage is equal to 5 V if the corresponding digital input bit is 1; else, it is 0 V. Note that this circuit is similar to that in ee101_network_3b.sqproj except that the 741 Op Amp model is used here.

Exercise Set

1. Find an expression for the output voltage in terms of the four source voltages (call them V_{s0} , V_{s1} , V_{s2} , V_{s3} from left to right) using superposition. (Hint: It will help to convert the $R-2R$ network into a Thevenin's equivalent circuit.)
2. Verify your results with simulation for a few specific input binary numbers.