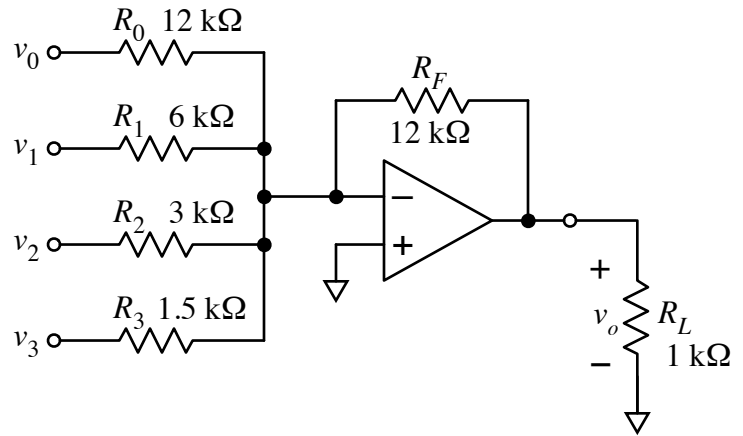


The op amp in the circuit at right is ideal. The four input voltages are digital in nature and can be either 0 V or 1 V, but nothing in between.

Calculate the expression for the output voltage in terms of the four inputs. Then calculate the value of the output voltage for all possible combinations of input voltages.



| v_3 | v_2 | v_1 | v_0 | v_o |
|-------|-------|-------|-------|-------|
| 0 V | 0 V | 0 V | 0 V | |
| 0 V | 0 V | 0 V | 1 V | |
| 0 V | 0 V | 1 V | 0 V | |
| 0 V | 0 V | 1 V | 1 V | |
| 0 V | 1 V | 0 V | 0 V | |
| 0 V | 1 V | 0 V | 1 V | |
| 0 V | 1 V | 1 V | 0 V | |
| 0 V | 1 V | 1 V | 1 V | |
| 1 V | 0 V | 0 V | 0 V | |
| 1 V | 0 V | 0 V | 1 V | |
| 1 V | 0 V | 1 V | 0 V | |
| 1 V | 0 V | 1 V | 1 V | |
| 1 V | 1 V | 0 V | 0 V | |
| 1 V | 1 V | 0 V | 1 V | |
| 1 V | 1 V | 1 V | 0 V | |
| 1 V | 1 V | 1 V | 1 V | |