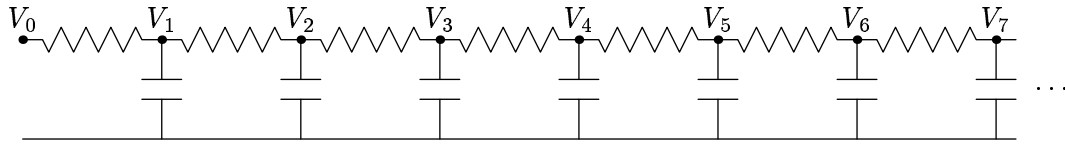


Problem set 2

Hand in by 10am on your supervision day. Clearly explain your reasoning.

1 *RC ladder*

Consider the following infinite circuit, which represents a cable, or a neuron without active circuits to regenerate the signal:



Each resistance is R and each capacitance is C . Derive a difference equation for $V_n(t)$ in terms of the neighboring voltages. What equation is it similar to? Why?

Suppose that you put in a voltage spike at the left end (so $V_0(t)$ is a delta function). Sketch qualitatively V_4 and V_8 as functions of time (on the same graph). How long, roughly, before V_{10} rises significantly? How about for V_{100} ?

2 Do problem 6 from the examples sheet

3 Do problem 8 from the examples sheet