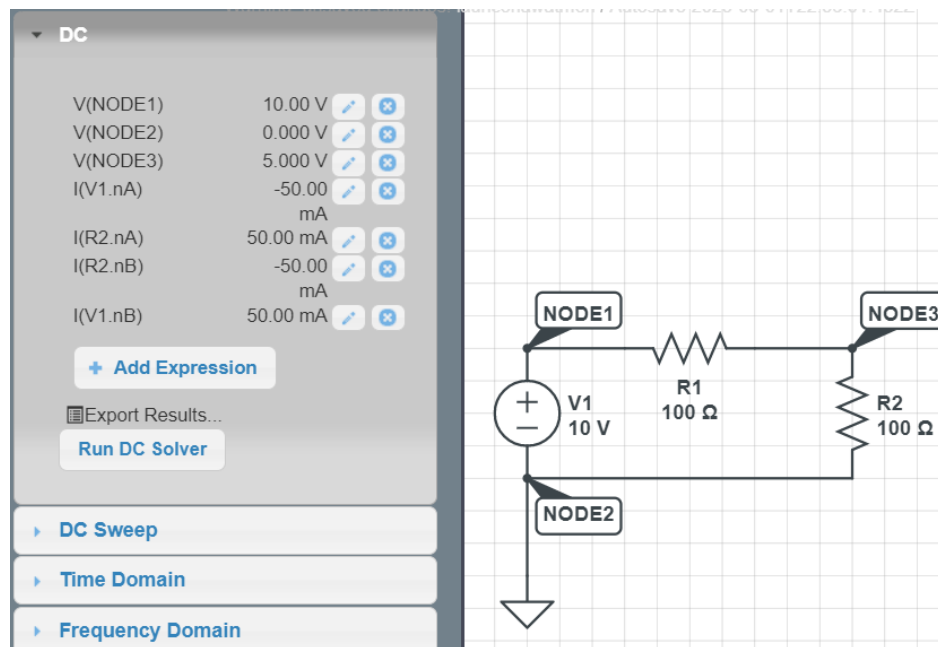
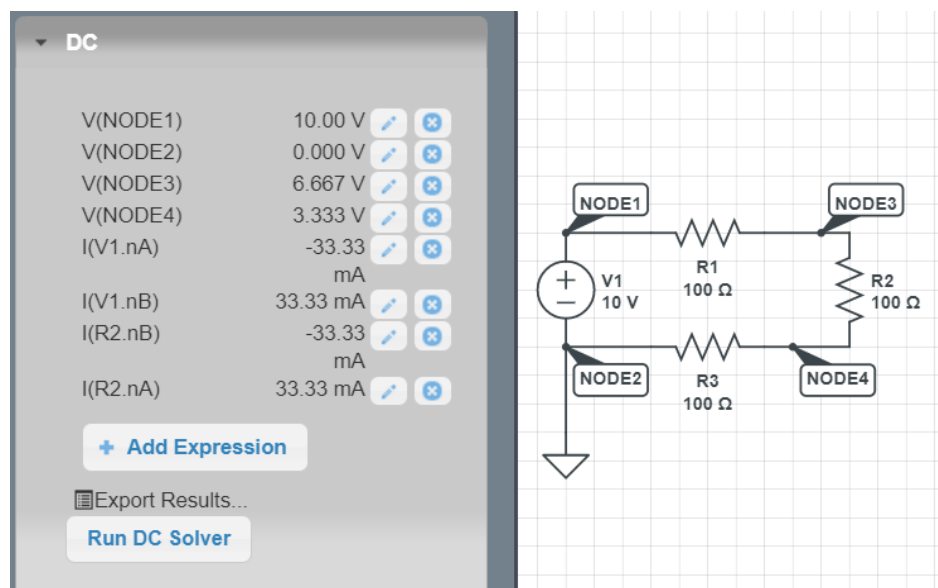


1c.

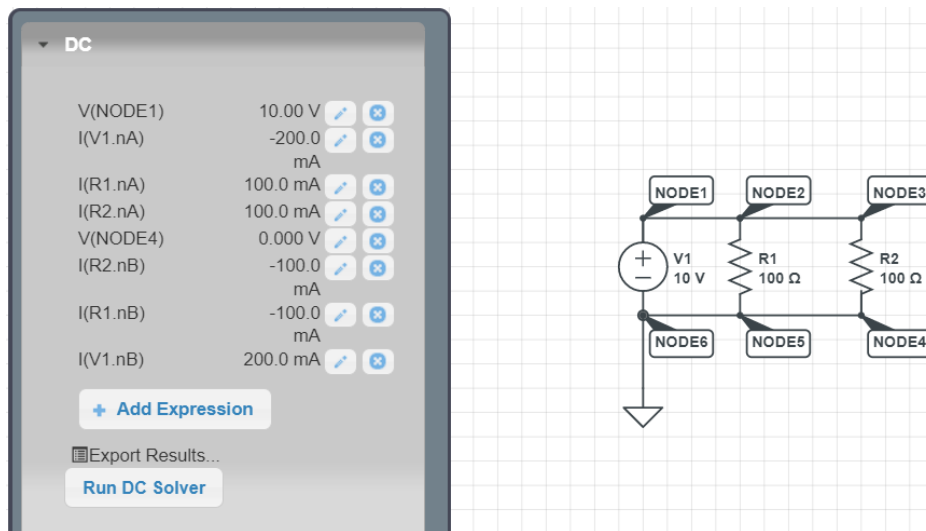


1d.

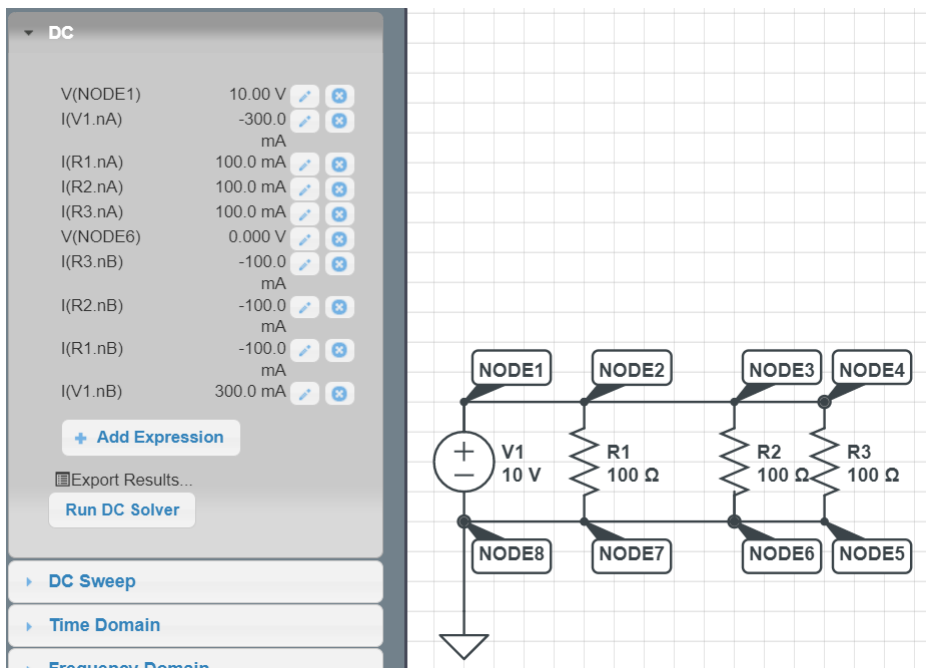


In a series circuit, the current through each of the components is the same, and the voltage across the circuit is the sum of the voltages across each component. In comparison to the case with two series resistors, adding a third series resistor reduces the amount of voltage flowing through each node and the overall current in the system.

2c.

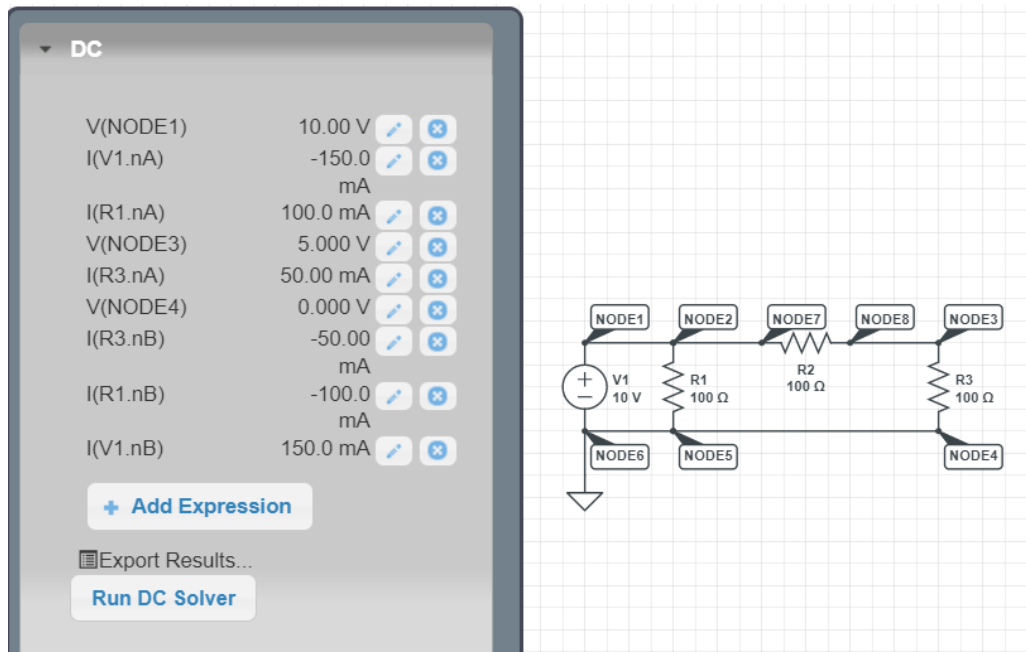


2d.



In a parallel circuit, the voltage across each of the components is the same, and the total current is the sum of the currents through each component. In comparison to the case with two parallel resistors, adding a third parallel resistor increases the current flowing into the voltage source while the voltage across each of the components stays the same.

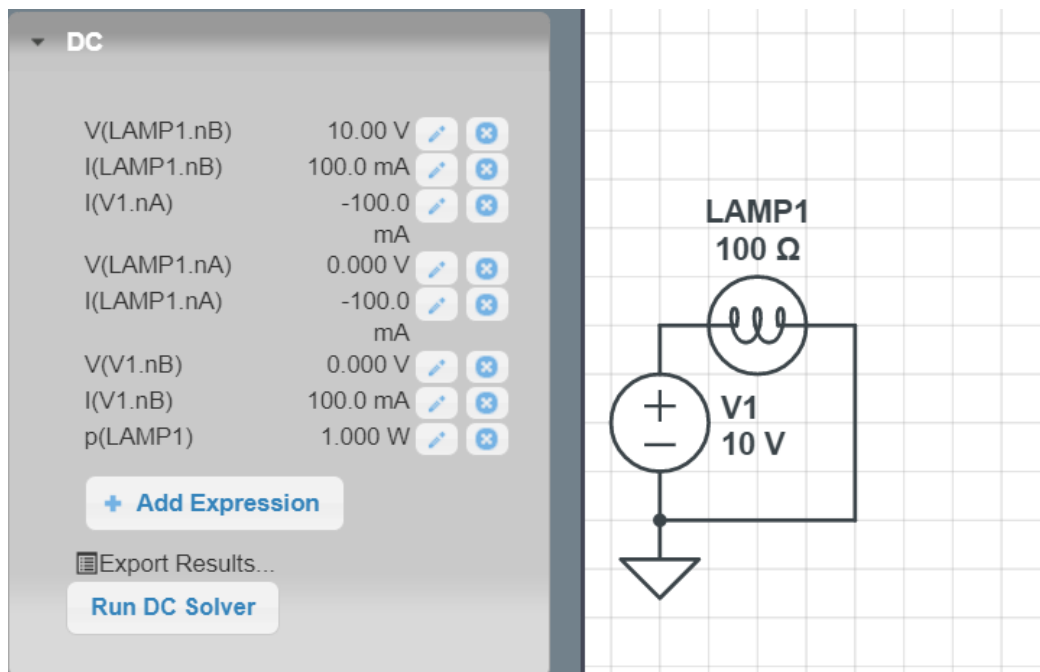
3c.



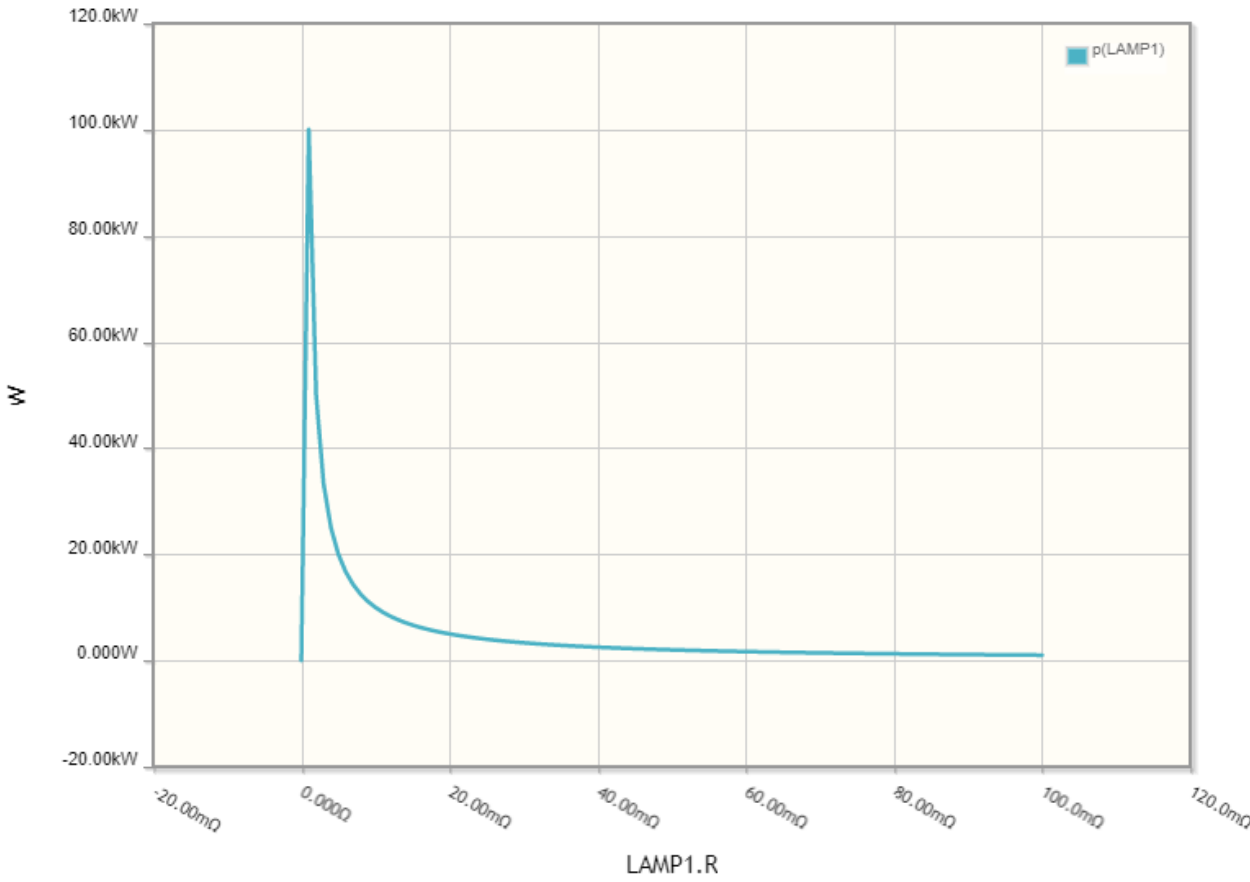
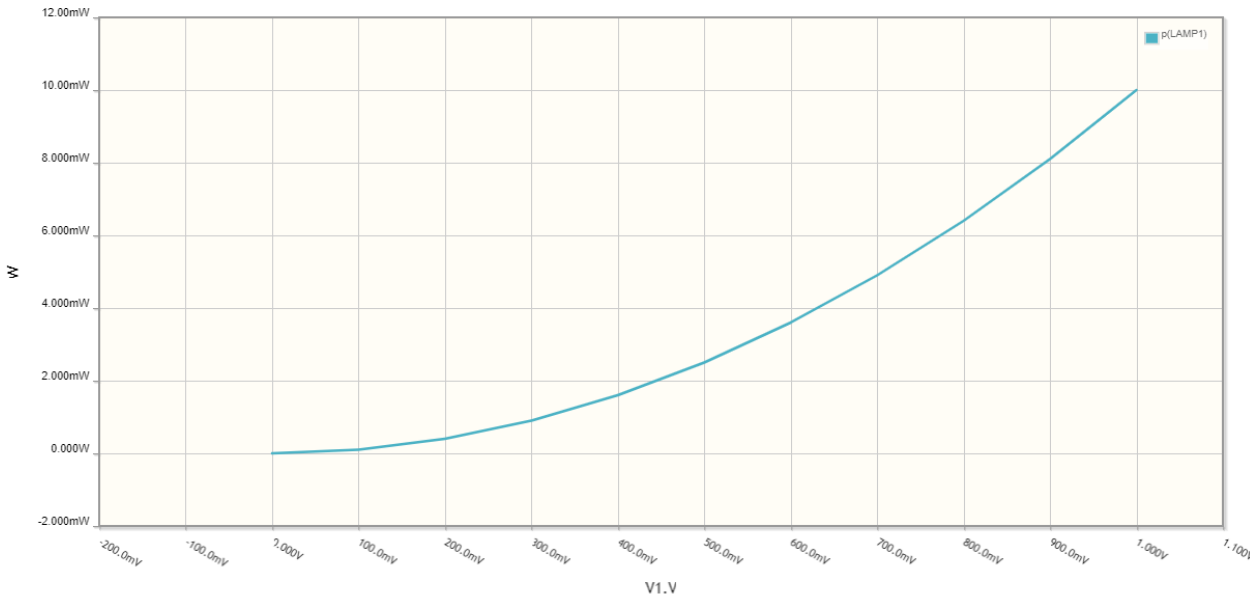
In the case of resistors only in series or only in parallel, either the current or voltage is constant. However, in the case of resistors in series and parallel, both the current and voltage are changing.

4a.  $P = V^2 / I = 10^2 / 100 = 1 \text{ W}$

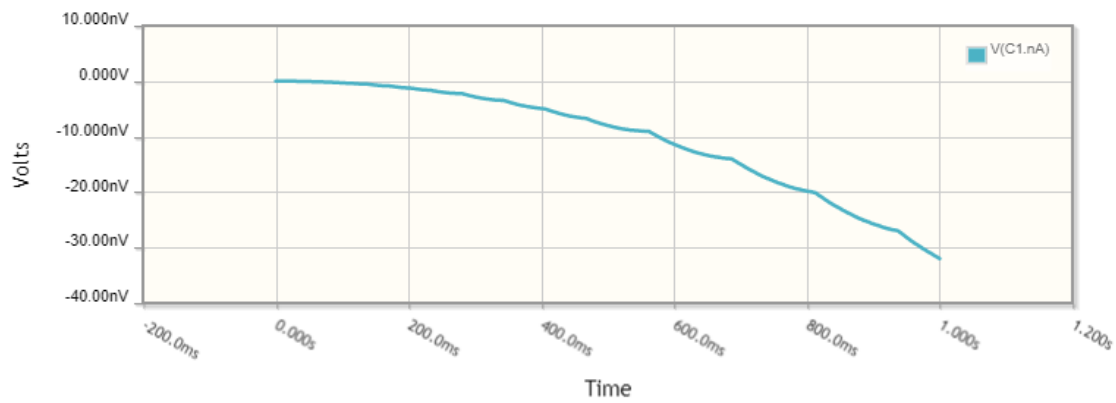
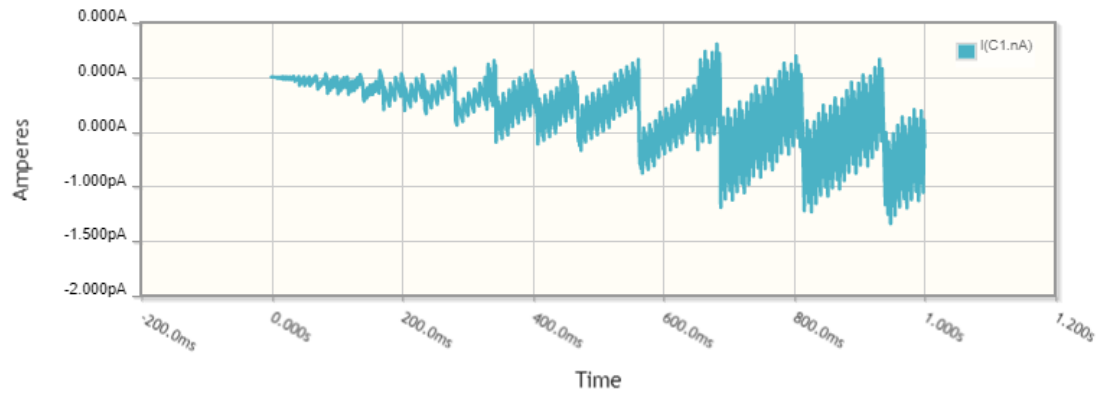
4b.



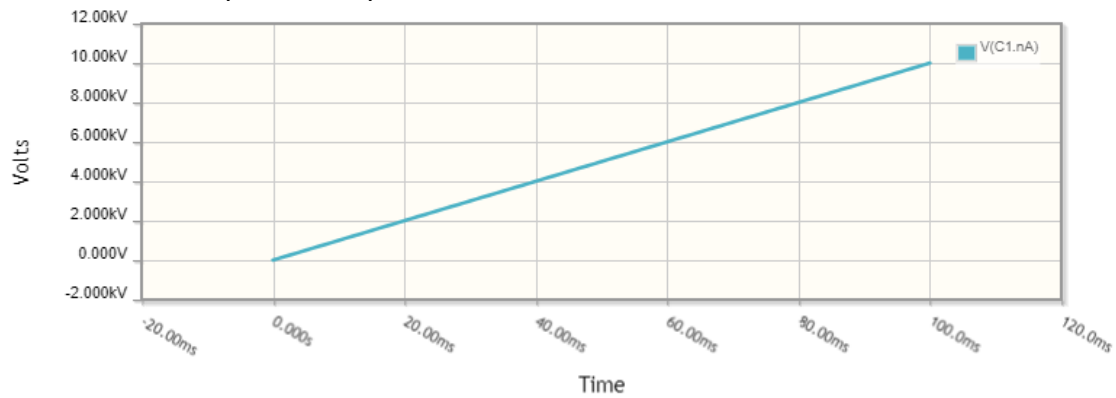
4c.

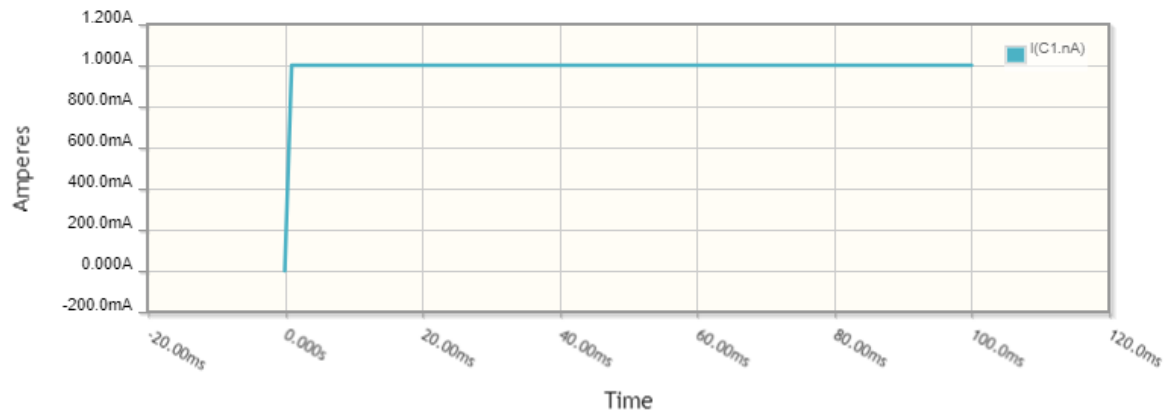


5b. 10 microfarad capacitor, sine current source



10 microfarad capacitor, step current source

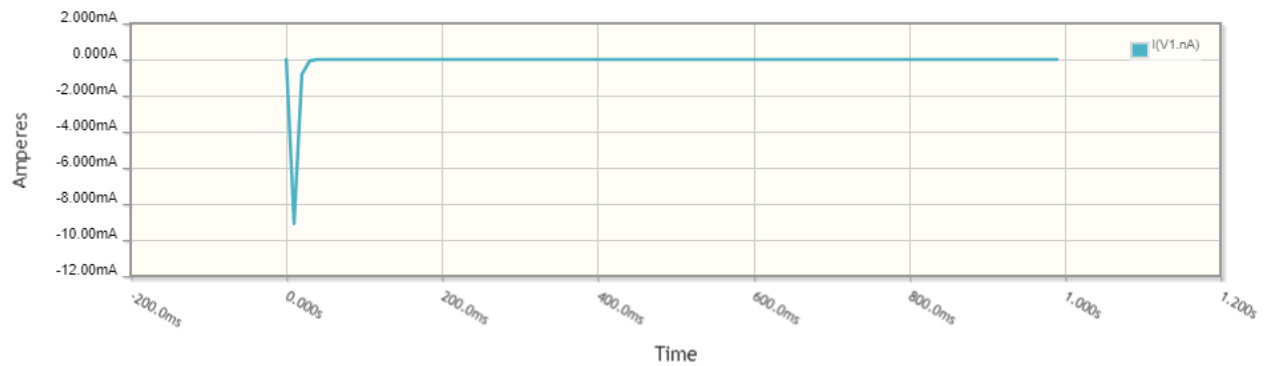
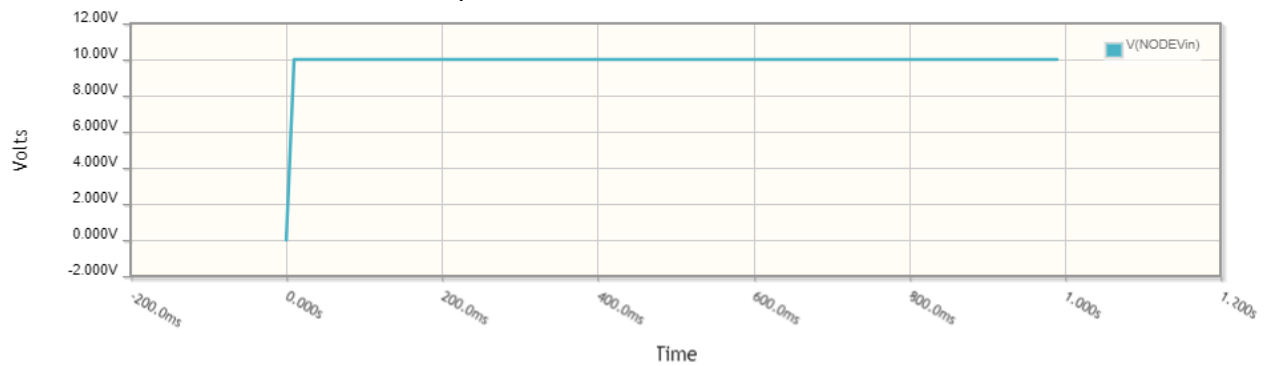




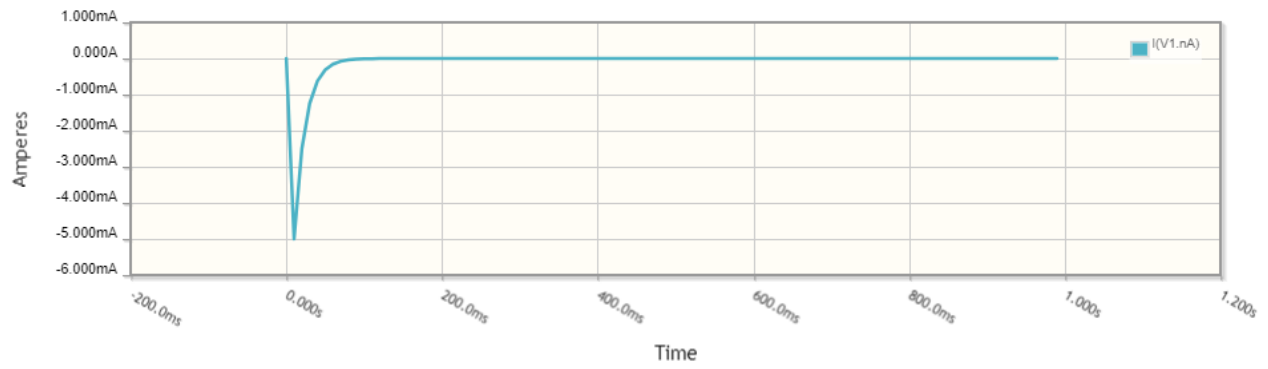
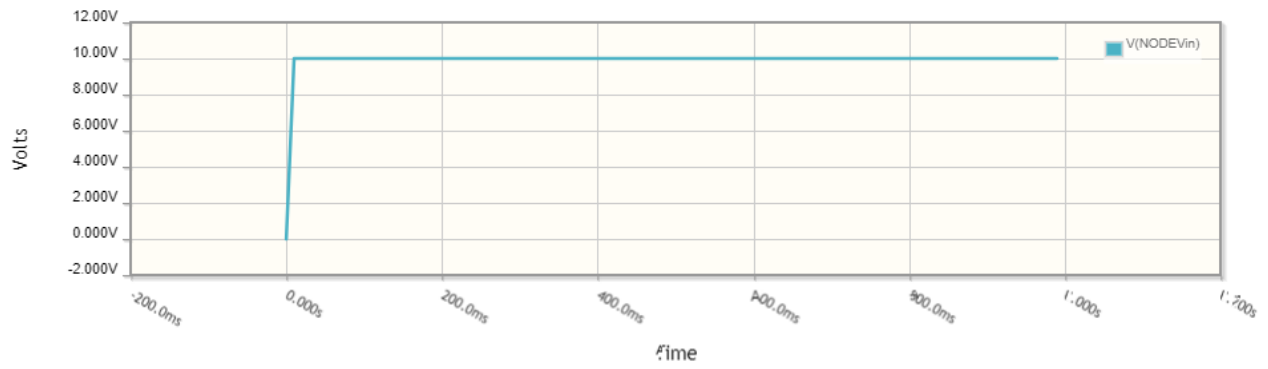
In either case, changing the value of the capacitor did not significantly change how the voltage or current in the system varies over time.

6b.

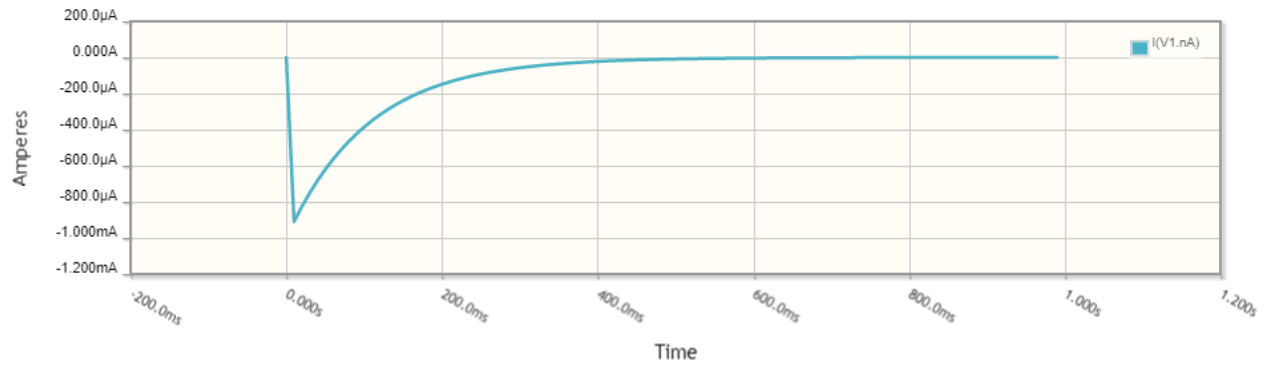
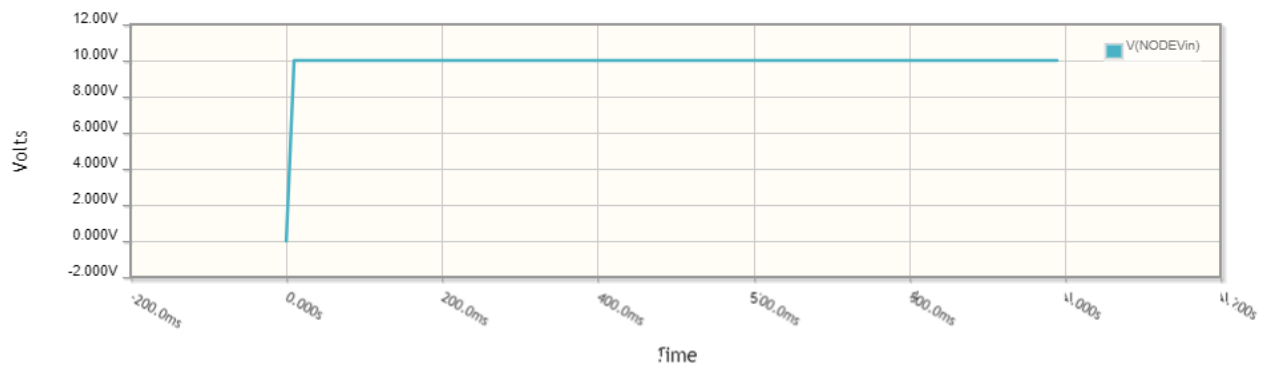
100 ohm resistor, 10 microfarad capacitor



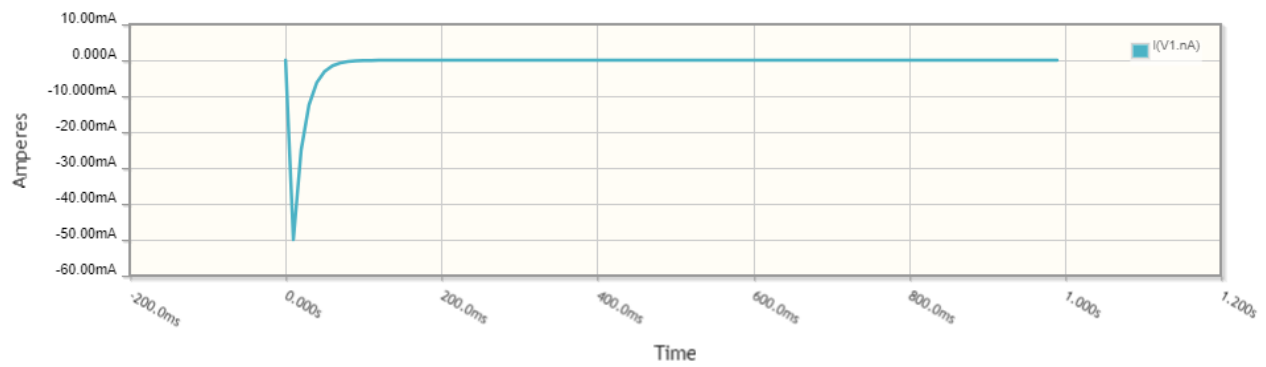
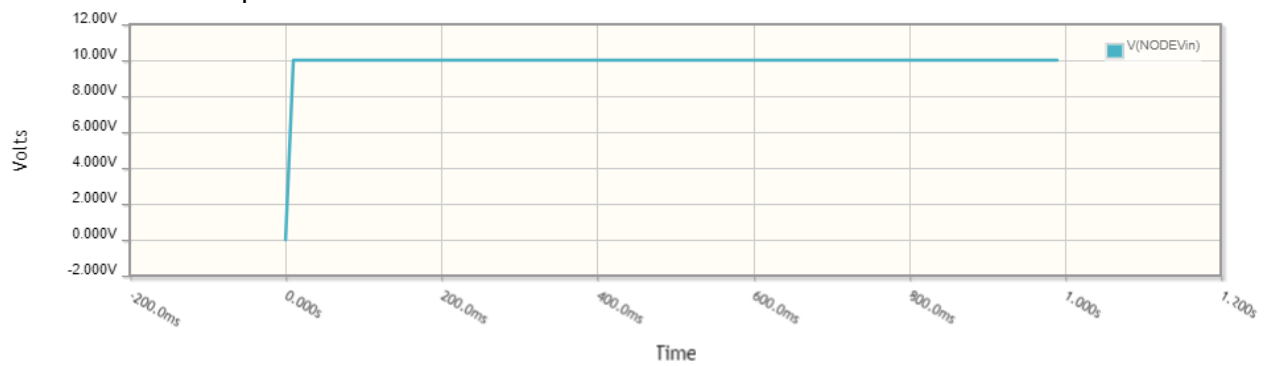
### 6c. 1 kohm resistor



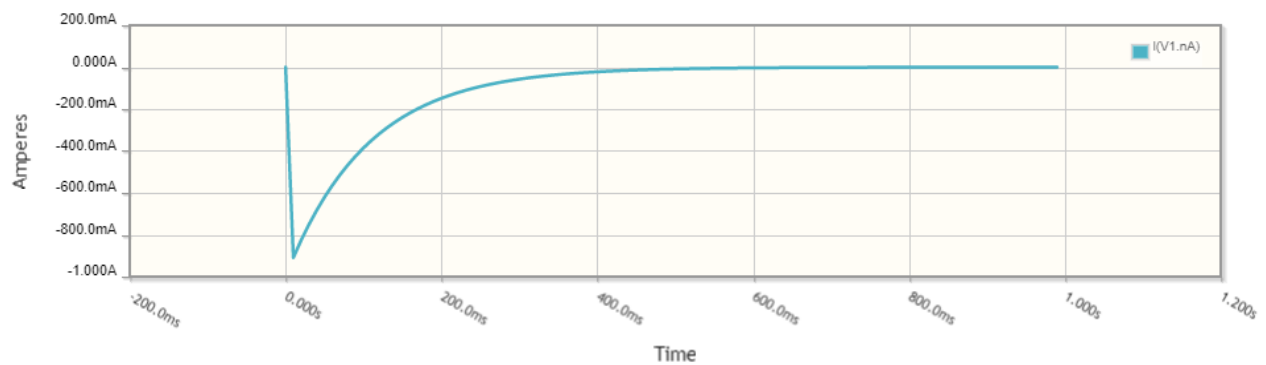
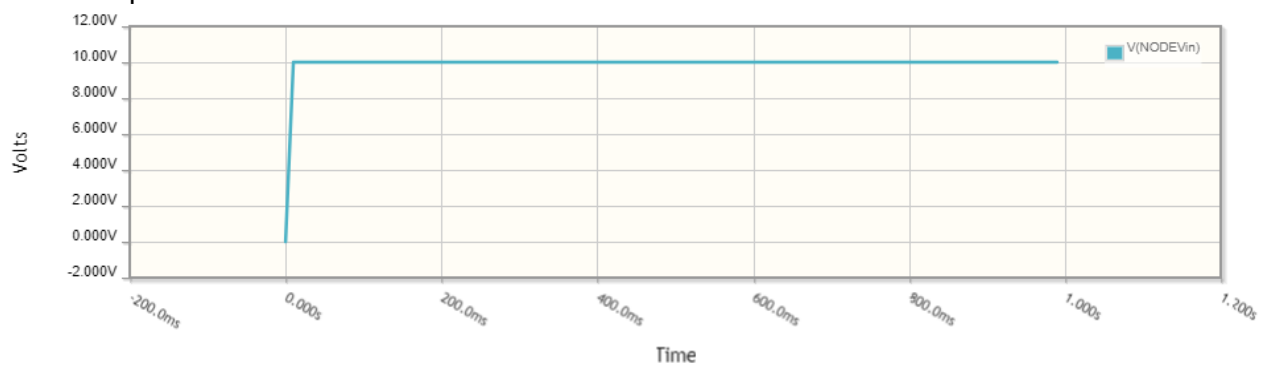
### 10 kohm resistor



### 100 microfarad capacitor



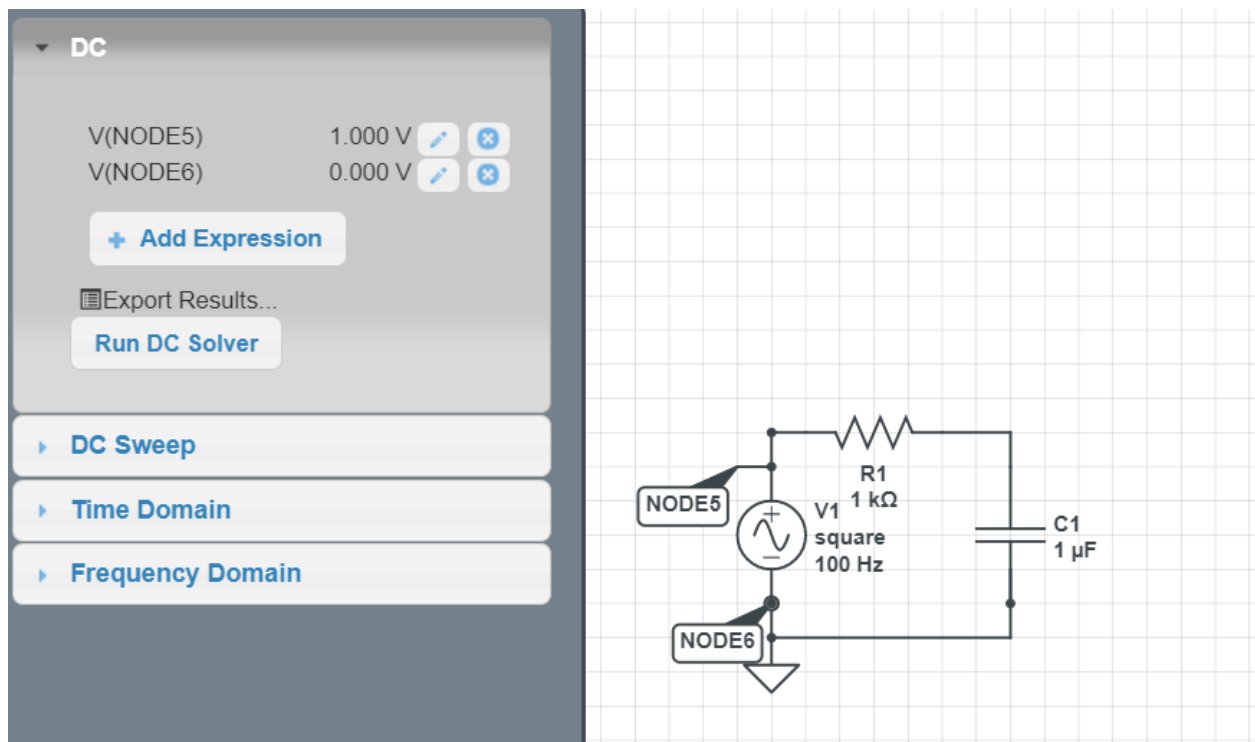
### 10 mF capacitor



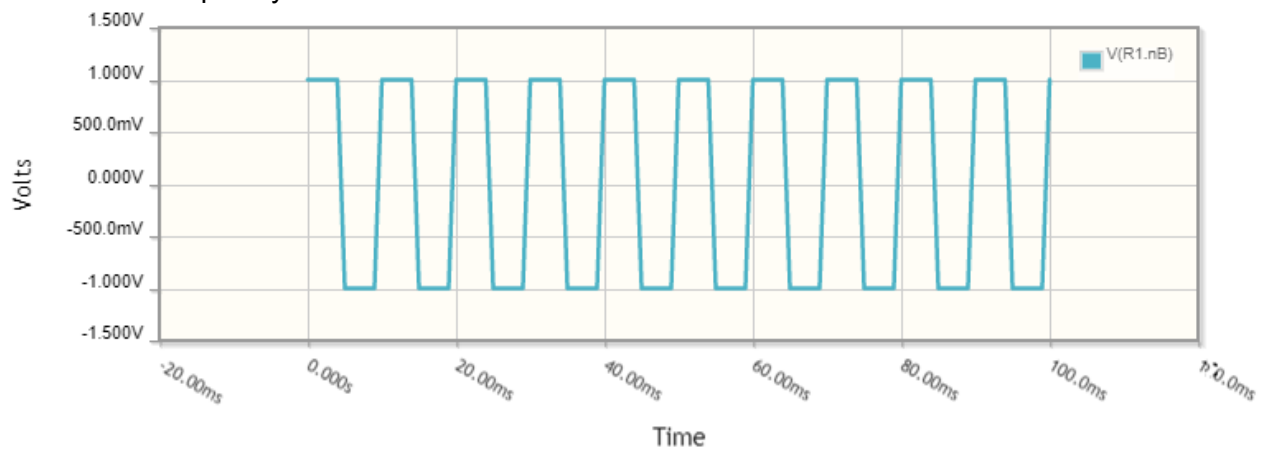
As you increase the resistance or capacitance in the system, the capacitor charges more slowly.

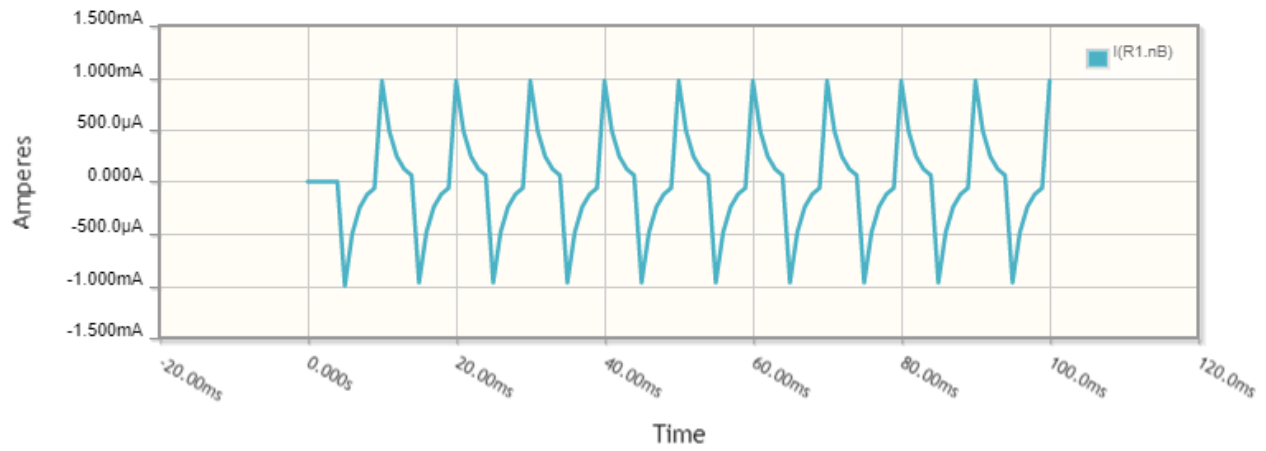


7a.

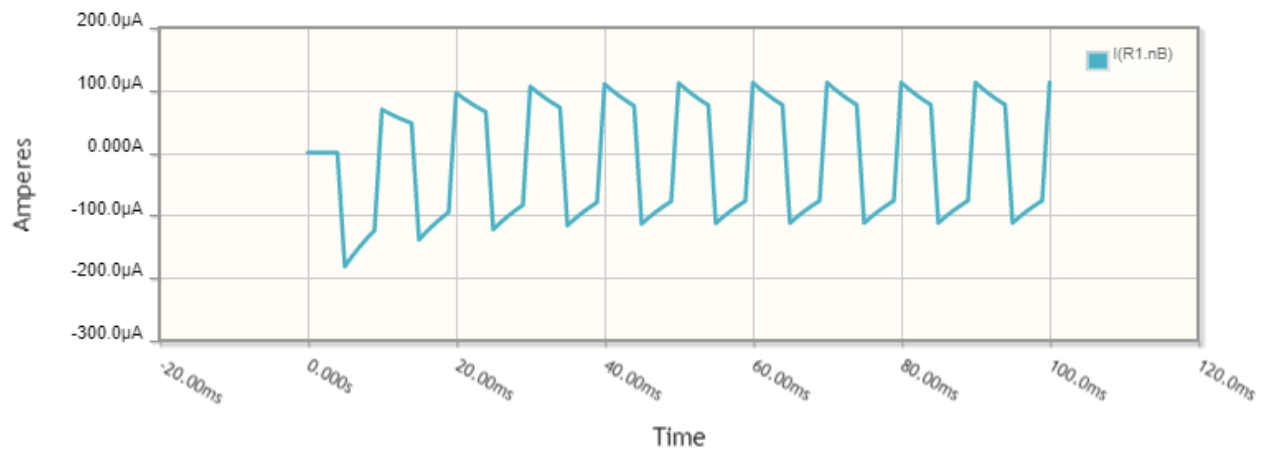
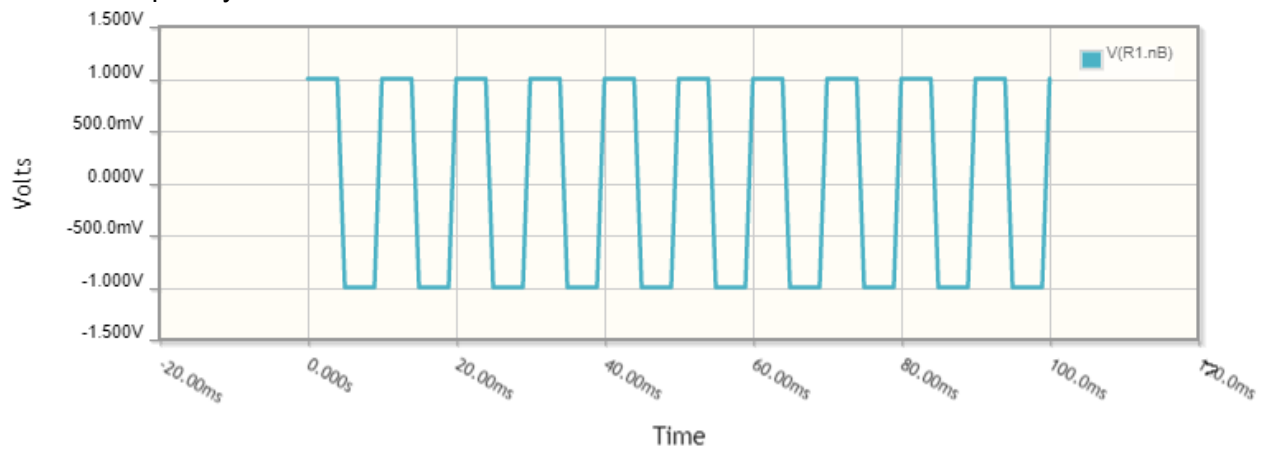


7b. 100 Hz frequency + 1 kohm resistor

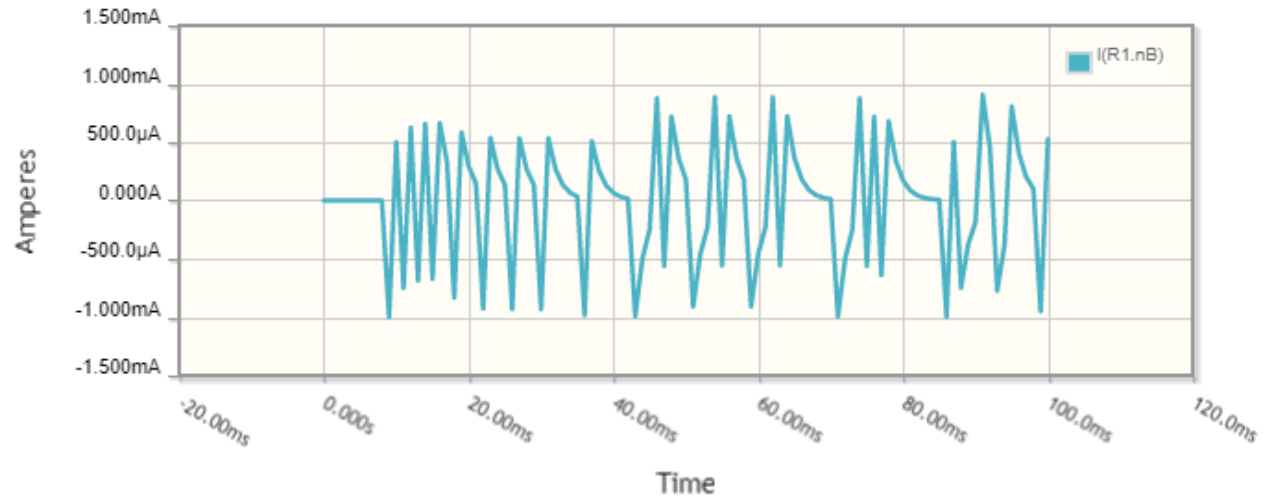
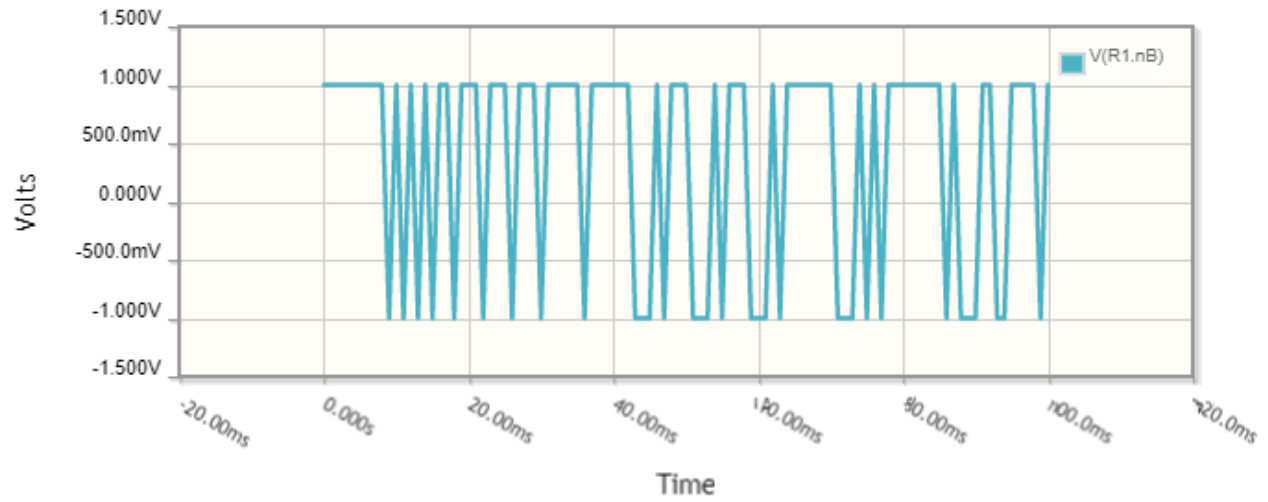




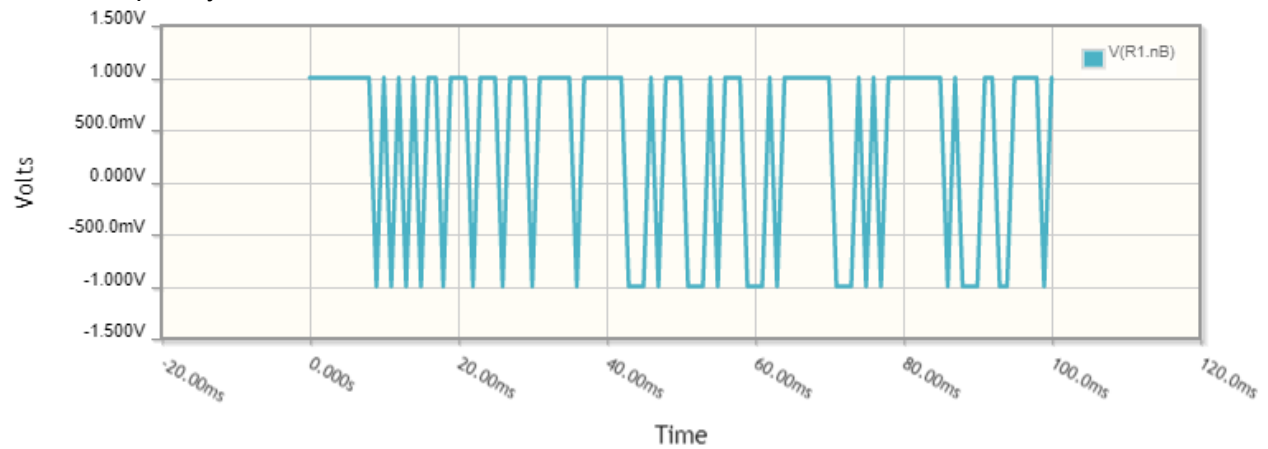
100 Hz frequency + 10 kohm resistor

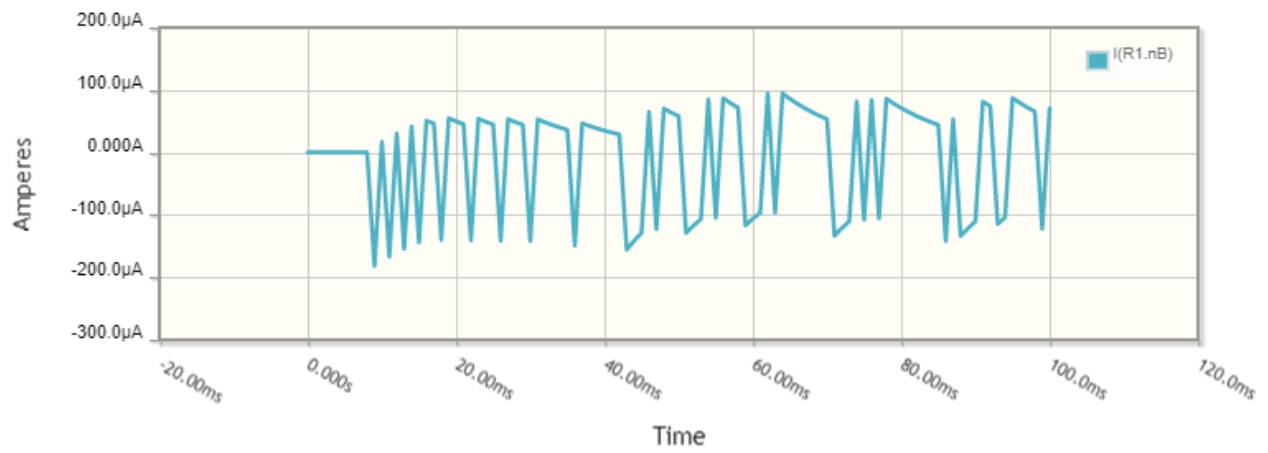


1 kHz frequency + 1 kohm resistor



1 kHz frequency + 10 kohm resistor





Changing the resistance does not affect the output voltage, it affects the current.