$$V_o(t) = Q / C, V_i(t) - V_o(t) = R \cdot i(t)$$

$$\frac{dV_o(t)}{dt} = \frac{V_i - V_o}{RC}$$

Use Laplace Transforms to solve for $t \geq 0$

$$V_o(s) = V_i(s) \times \frac{1}{s + 1/\tau}$$

For discrete data with j index over time bins(Δt)

$$V_o(j) = \alpha V_o(j-1) + (1-\alpha) V_i(j)$$

$$\alpha = (RC / \Delta t) / (1 + RC / \Delta t)$$