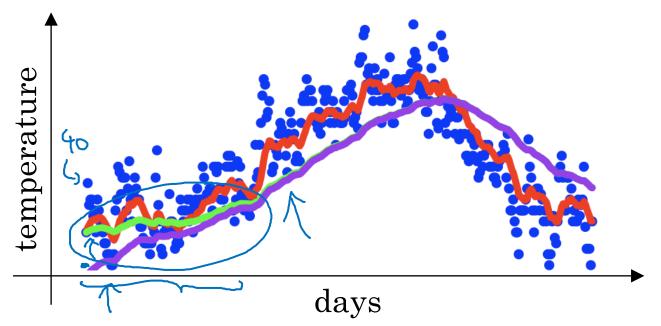


## Optimization Algorithms

Bias correction in exponentially weighted average

## Bias correction



$$v_t = \beta v_{t-1} + (1 - \beta)\theta_t$$

$$v_0 = 0$$

$$v_1 = 0.98 \quad v_0 + 0.020$$

$$v_2 = 0.98 \quad v_1 + 0.020$$

$$v_3 = 0.98 \quad v_1 + 0.020$$

$$v_4 = 0.020$$

$$v_6 = 0.01960$$

$$v_6 = 0.020$$

$$\frac{1-\beta^{t}}{t=2:} \quad 1-\beta^{t} = 1-(0.98)^{2} = 0.0396$$

$$\frac{1-\beta^{t}}{0.0396} = 0.0396$$

**Andrew Ng**