deeplearning.ai

Optimization Algorithms

Exponentially weighted averages

Temperature in London

$\theta_1 = 40°F$ 4°C $\Leftarrow$

$\theta_2 = 49°F$ 9°C

$\theta_3 = 45°F$

$\vdots$

$\theta_{180} = 60°F$ 15°C

$\theta_{181} = 56°F$

$\vdots$
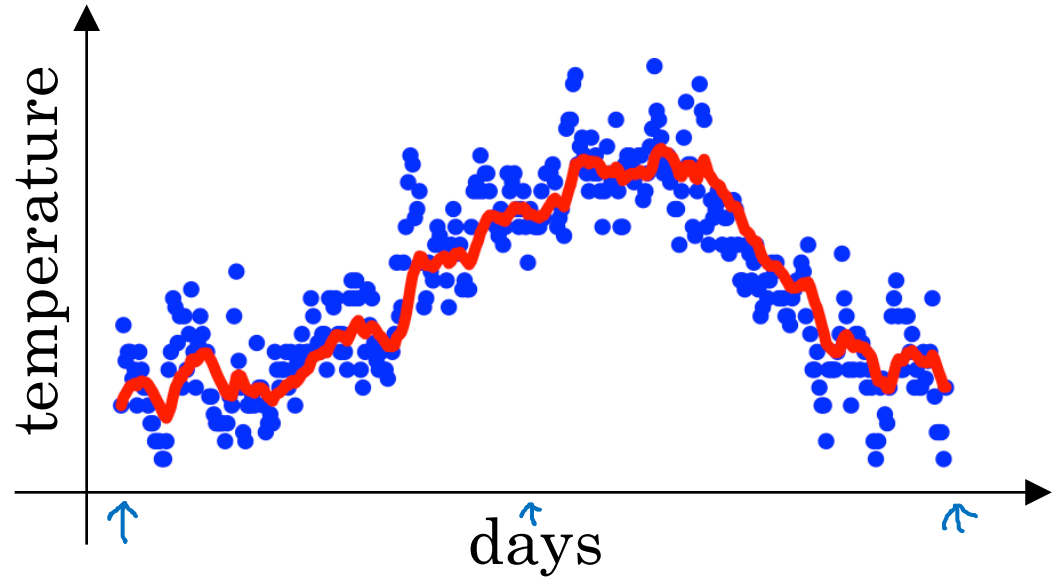
$V_0 = 0$

$V_1 = 0.9 V_0 + 0.1 \theta_1$

$V_2 = 0.9 V_1 + 0.1 \theta_2$

$V_3 = 0.9 V_2 + 0.1 \theta_3$

$\vdots$

$$\boxed{V_t = 0.9 V_{t-1} + 0.1 \theta_t}$$

Andrew Ng

Exponentially weighted averages

$$V_t = \beta V_{t-1} + (1-\beta)\Theta_t \leftarrow$$

$$\beta = 0.9 \quad : \quad \approx 10 \text{ days' temperature}$$

$$\beta = 0.98 \quad : \quad \approx 50 \text{ days}$$

$$\beta = 0.5 \quad : \quad \approx 2 \text{ days}$$

V_t as approximately average over

$$\rightarrow \approx \frac{1}{1-\beta} \text{ days' temperature.}$$

$$\frac{1}{1-0.98} = 50$$

days