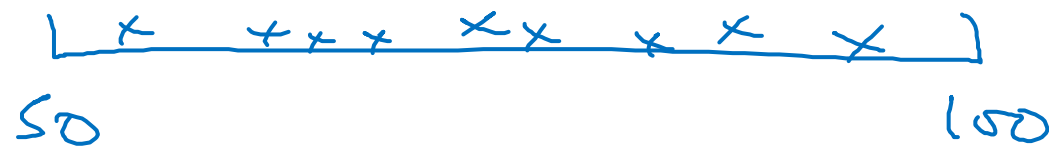deeplearning.ai

Hyperparameter tuning

Using an appropriate scale to pick hyperparameters

Picking hyperparameters at random

$\rightarrow n^{[l]} = 50, \ldots, 100$

$$\underset{50}{\underline{[}} \times \quad \times_{\times\times} \quad \times_\times \quad \times \quad \times \quad \times \underset{100}{]}$$

$\rightarrow$ #layers $L:$ $2 - 4$

$2, 3, 4$

Appropriate scale for hyperparameters

$\alpha = 0.0001 \ldots\ldots, 1$

0.0001 1

$0.1 -$ $-$ $-$ $-$ $-$ $-$ $-\,-\,-1$

0.0001 0.001 0.01 0.1

10^{-4}

10^{a}

$10^{0} \quad 10^{b}$

$a = \log_{10} 0.0001 \quad r = -4 * np.random.rand() \qquad \leftarrow \quad r \in [-4, 0]$

$b = \log_{10} 1$

$= 0$
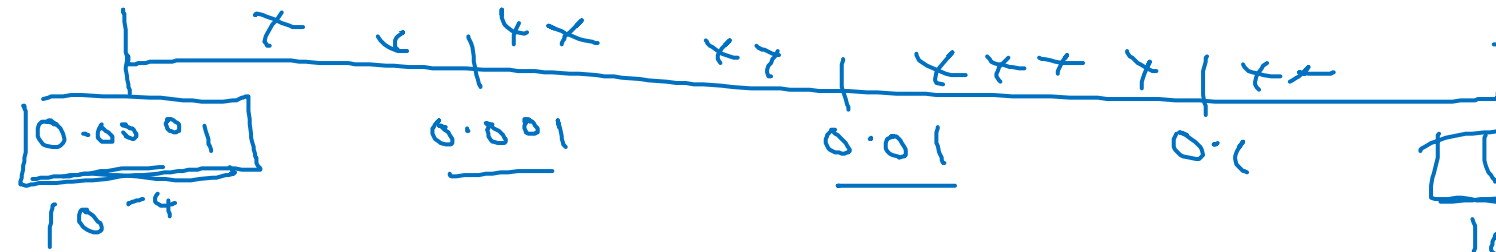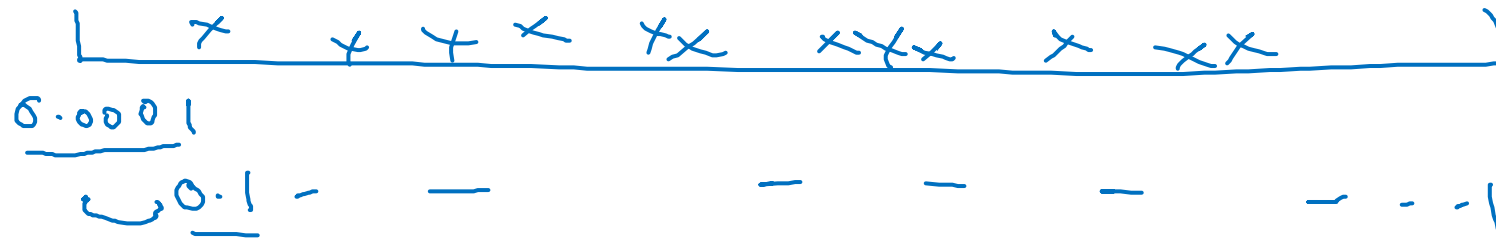
$= -4 \qquad \alpha = 10^{r} \qquad\qquad \leftarrow \quad 10^{-4} \ldots 10^{0}$

$10^{a} \ldots 10^{b} \qquad \dfrac{r \in [a, b]}{[-4, 0]} \qquad \alpha = 10^{r}$

Hyperparameters for exponentially weighted averages
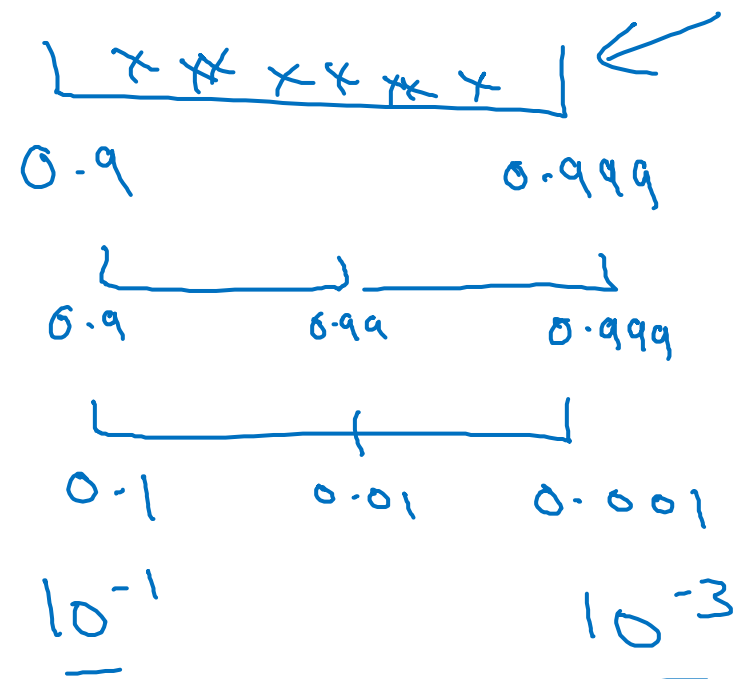
$\beta = 0.9 \quad .... \quad 0.999$

$\downarrow \qquad\qquad\qquad \downarrow$

$10 \qquad\qquad\qquad 1000$

$1-\beta = 0.1 \quad .... \quad 0.001$

$\beta: \quad 0.9000 \rightarrow 0.9005 \quad \} \sim 10$

$\beta: \quad 0.999 \rightarrow 0.9995$

$\sim 1000 \qquad\qquad \sim 2000$

$\dfrac{1}{1-\beta}$

$0.9 \qquad\qquad\qquad 0.999$

$0.9 \qquad 0.99 \qquad 0.999$

$0.1 \qquad 0.01 \qquad 0.001$

$10^{-1} \qquad\qquad\qquad 10^{-3}$

$r \in [-3, -1]$

$1-\beta = 10^{r}$

$\beta = 1 - 10^{r}$