



**deeplearning.ai**

# Hyperparameter tuning

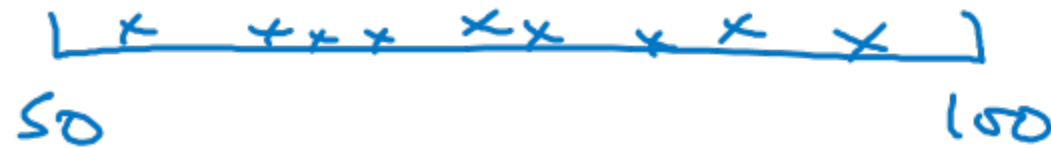
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Using an  
appropriate scale  
to pick

hyperparameters

# Picking hyperparameters at random

$$\rightarrow n^{\text{test}} = 50, \dots, 100$$

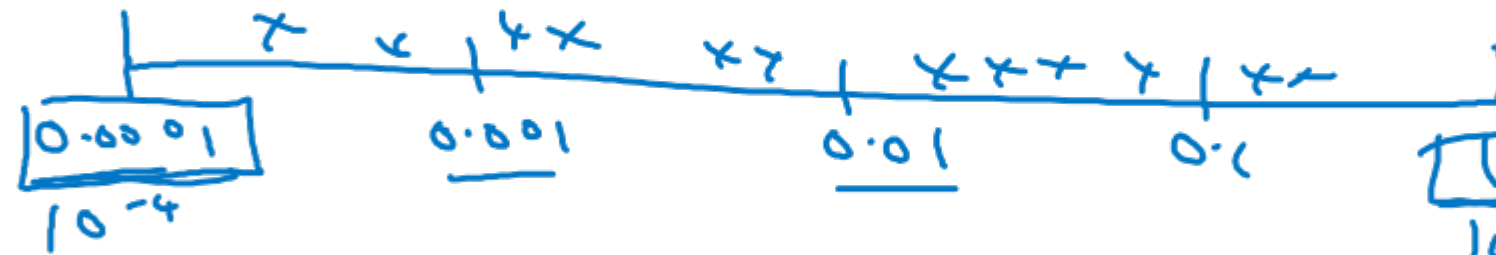
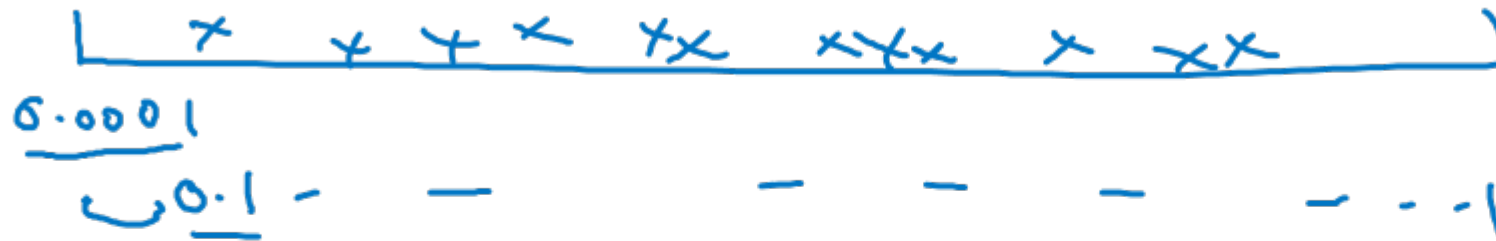


$$\rightarrow \# \text{layers} \quad L: \quad 2 - 4$$

$$2, 3, 4$$

# Appropriate scale for hyperparameters

$$\alpha = 0.0001, \dots, 1$$



$$a = \log_{10} 0.0001 = -4$$

$$r = -4 * \text{np.random.rand}()$$

$$\alpha = 10^r$$

$$r \in [-4, 0]$$

$$\alpha = 10^{-4} \dots 10^0$$

$$10^a \dots 10^b$$

$$\frac{r \in [a, b]}{[-4, 0]}$$

$$\alpha = 10^r$$

$$\frac{b = \log_{10} 1}{= 0}$$

# Hyperparameters for exponentially weighted averages

$$\beta = 0.9 \quad \dots \quad 0.999$$

$\downarrow$                        $\downarrow$   
 $10$                        $1000$

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

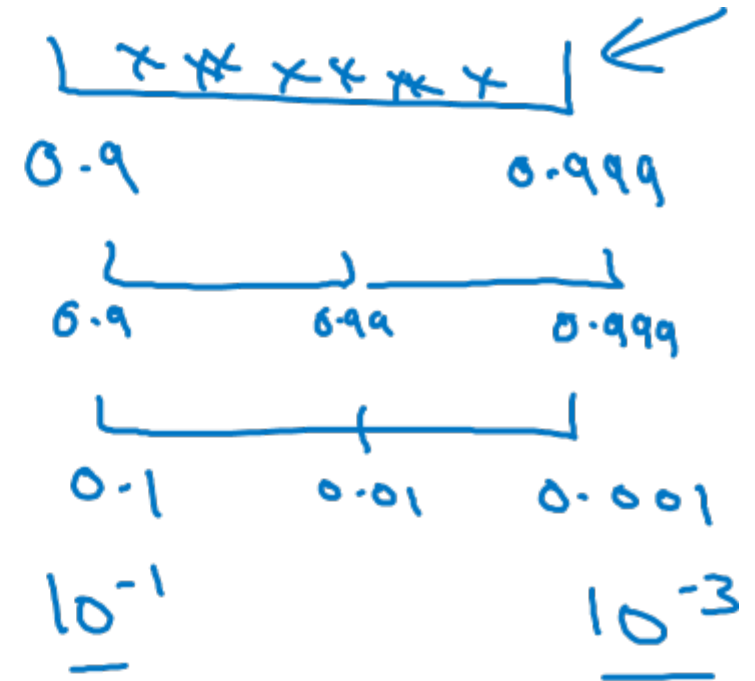

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$$\beta: 0.999 \rightarrow 0.9995 \quad \} \sim 10$$

$$\beta: 0.999 \rightarrow 0.9995$$

$\sim 1000$                        $\sim 2000$

$$\frac{1}{1 - \beta_K}$$



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

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

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