## Loss functions













3.2

cat

5.1

Sar

2.0

2.9

Losses:

frog

$$L_i = \sum_{j \neq y_i} \max(0, s_j - s_{y_i} + 1)$$
=  $\max(0, 5.1 - 3.2 + 1)$   
+  $\max(0, -1.7 - 3.2 + 1)$   
=  $\max(0, 2.9)$  +  $\max(0, -3.9)$   
=  $2.9 + 0$   
=  $2.9 + 0$ 







Loss functions







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2.5 -3. 1.

6.4

2.0

 $L_i = \sum_{j 
eq y_j} \max(0, s_j - s_{y_i} + 1)$ = max(0, -2.6) + max(0, -1.9) +max(0, 2.0 - 4.9 + 1) = max(0, 1.3 - 4.9 + 1)0+0=

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Losses:

frog

car

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## Loss functions















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4.9

2.0

-1.7

frog

Sar

gat

2.9

Losses



$$i = \sum_{j \neq y_i} \max(0, s_j - s_{y_i} + 1)$$
 car
$$= \max(0, 2.2 - (-3.1) + 1)$$
 car
$$+ \max(0, 2.5 - (-3.1) + 1)$$

$$= \max(0, 6.3) + \max(0, 6.6)$$
 frog
$$= 6.3 + 6.6$$
 Losses:





Loss functions – Discussion (examples, 2W)





3.2

cat

 $L_i 
otin \sum_{j 
eq y_i} \max(0, s_j - s_{y_i} + 1)$ 

Loss over full dataset is average:

2.5

2.0

2.9

$$L = \frac{1}{N} \sum_{i=1}^{N} L_{i}$$

$$L = (2.9 + 0 + 12.9)(3)$$

$$= 5.27$$

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