



# Episode Based Training (1)



Mimic the few-shot learning setting via episode based training.

An **episode** in few-shot learning consists of a sample set (  $S$  )  
and a query set (  $Q$  )

$$\text{Episode} = \{S, Q\}$$

# Sample Set (S):

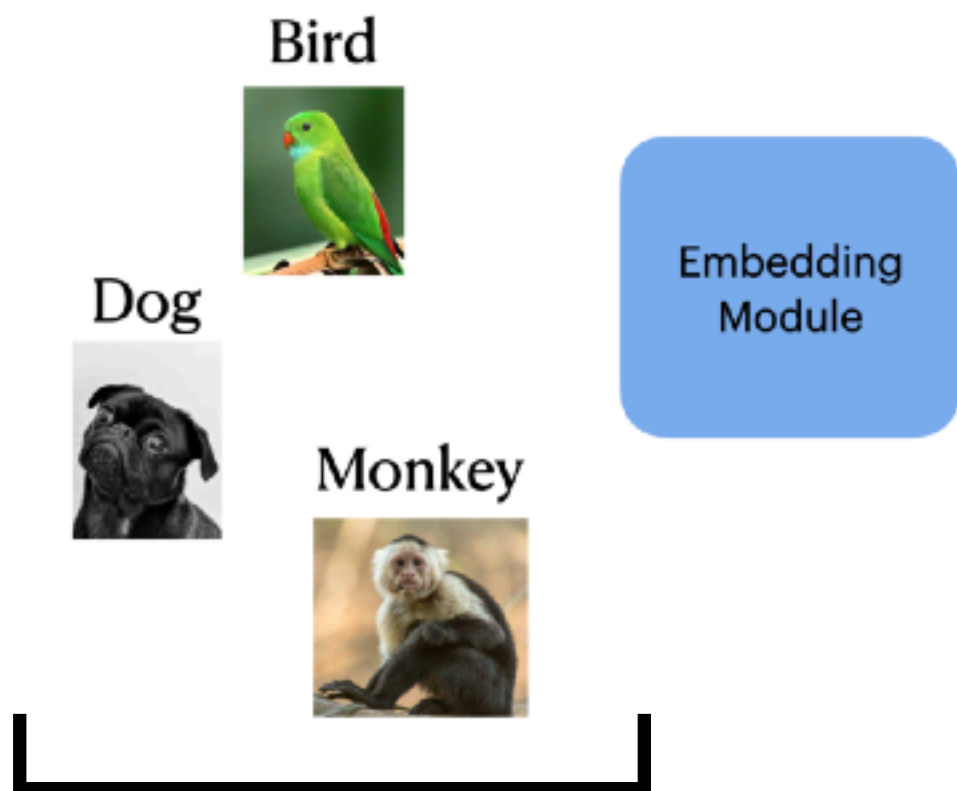
Randomly selecting  $C$  classes from the training set with  $K$  labelled samples

$$S = \{(x_i, y_i)\}_{i=1}^m, \quad m = K \times C$$

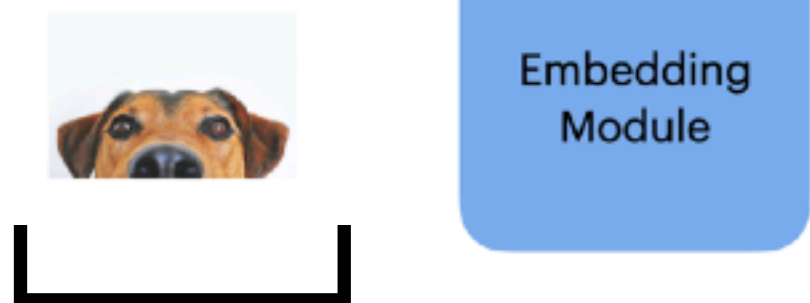
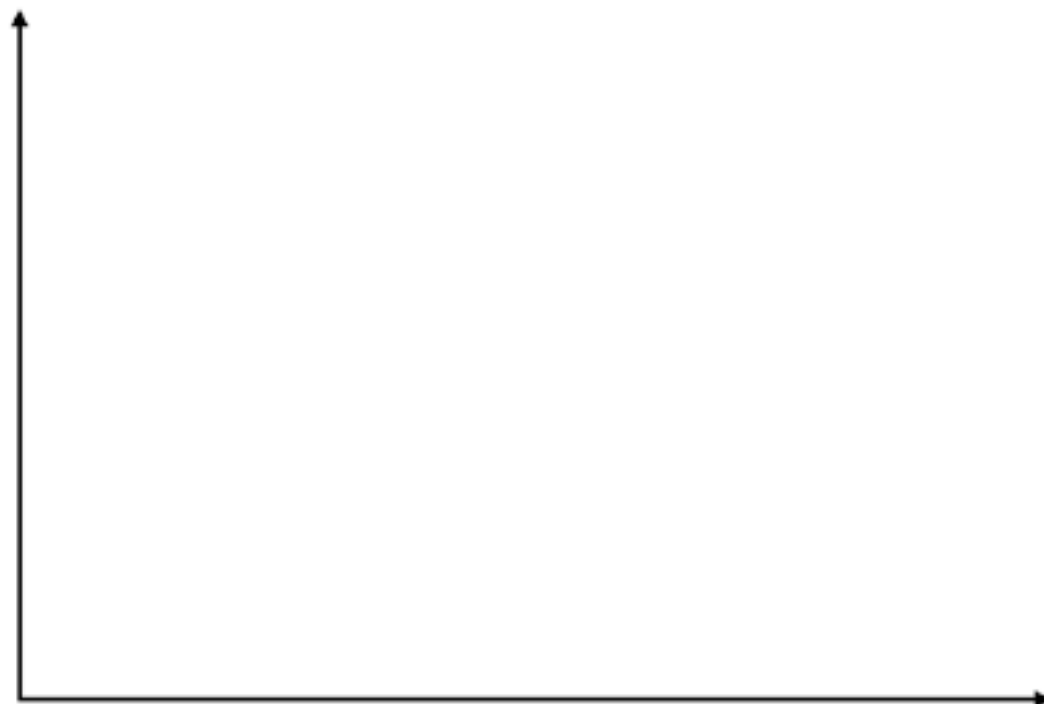
# Query Set (Q):

A fraction of the  
**remainder** of those  
C classes

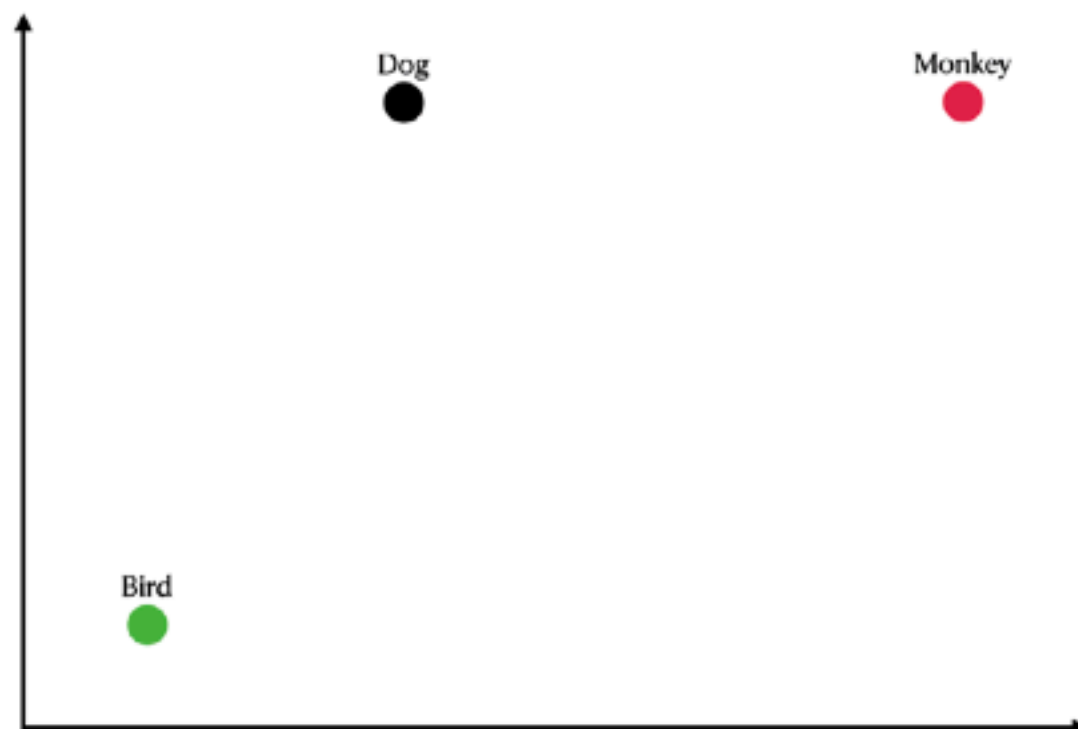
$$Q = \{(x_j, y_j)\}_{j=1}^n$$

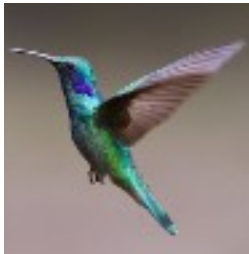


$S$



$Q$







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$$\text{Episode} = \{S, Q\}$$

Sample Set ( $S$ ):

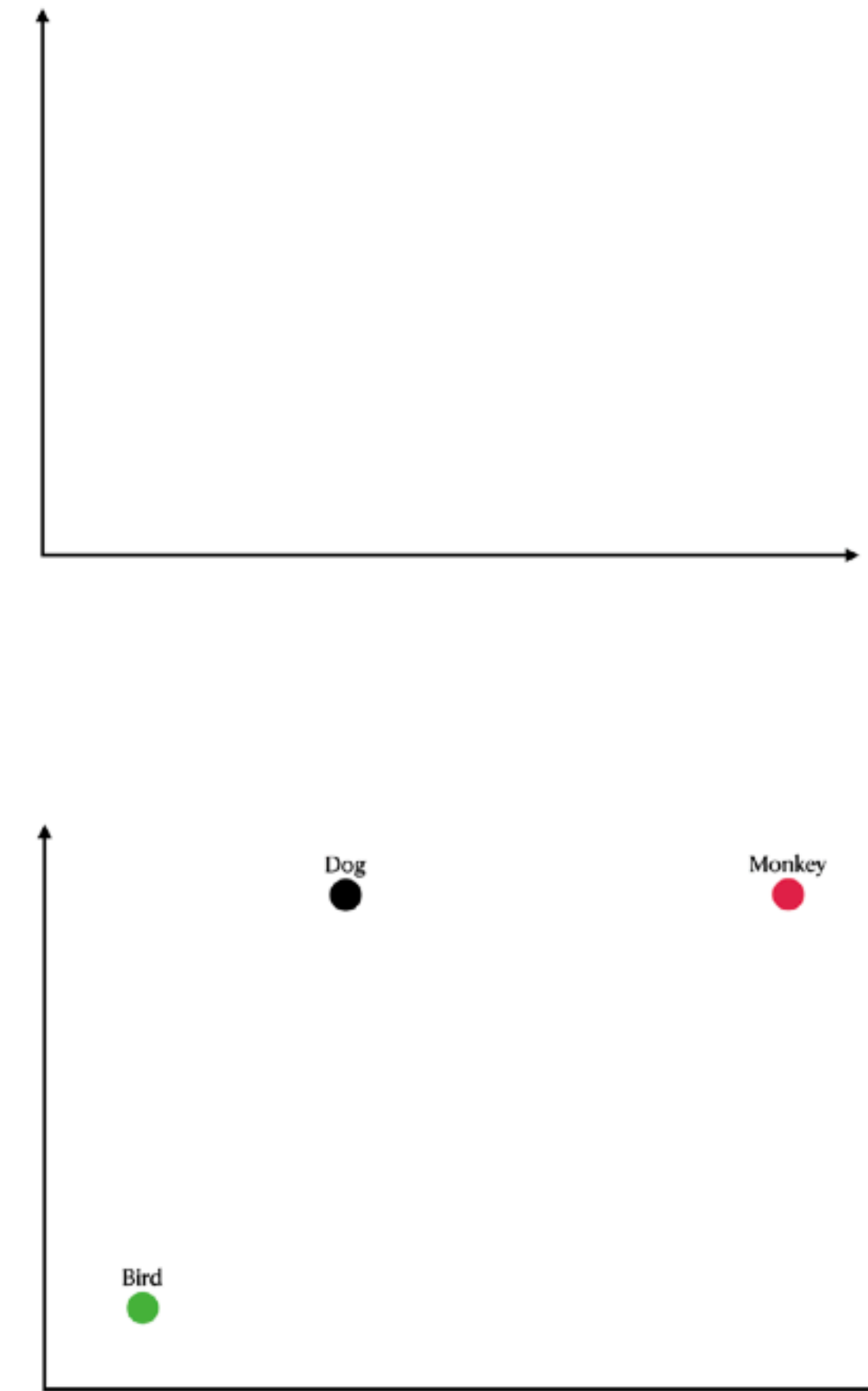
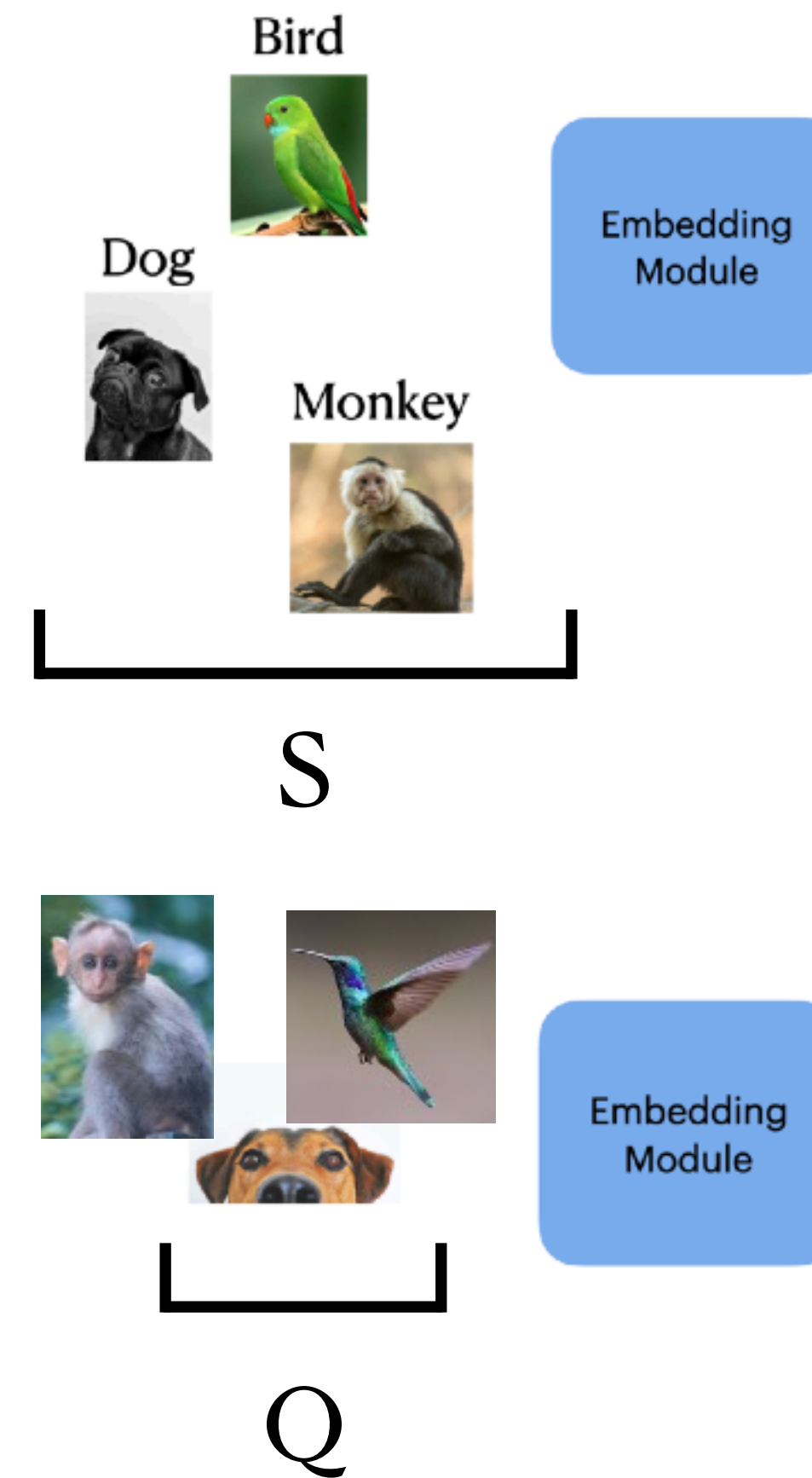
Randomly selecting  $C$  classes from the training set with  $K$  labelled samples

$$S = \{(x_i, y_i)\}_{i=1}^m, \quad m = K \times C$$

Query Set ( $Q$ ):

A fraction of the **remainder** of those  $C$  classes

$$Q = \{(x_j, y_j)\}_{j=1}^n$$



# Episode Based Training (2)

We are going to treat episodes as mini-batches in training

$$\mathcal{L}_{\text{episode}}(S, Q) = \sum_{i=1}^m \sum_{j=1}^n \left( r_{i,j} - 1(y_i = y_j) \right)^2$$

: loss for an episode defined by the support set  $S$  and the query set  $Q$

Diagram illustrating the components of the loss function:

- $r_{i,j}$  points to: Relation score of query image  $j$  with sample image  $i$
- $y_i$  points to: Label of image  $i$
- $y_j$  points to: Label of image  $j$