

# Introduction to Machine Learning

## Information Theory

### Optimal Code Length

### Entropy and Optimal Code Length



#### Learning goals

- Know that source coding is about encoding messages efficiently

#### Learning goals

- Know how to compute the average length of a code
- Know that source coding is about encoding messages efficiently
- Know that the entropy of the source distribution is the lower bound for the average length of a code
- Know how to compute the average length of a code
- Know that the entropy of the source distribution is the lower bound for the average code length

0 0 0 1 0 0 1 1

encoded string

00 01 00 11

codewords

0 0 0 1 0 0 1 1

dog cat dog bird

encoded string  
source symbols

00 01 00 11

codewords

dog cat dog bird

source symbols