Modul 3

Intro to K Nearest Neighbors

Data Science Program

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Reading Assignment

Complete Chapter 4

Introduction to Statistical Learning

By Gareth James, et al.

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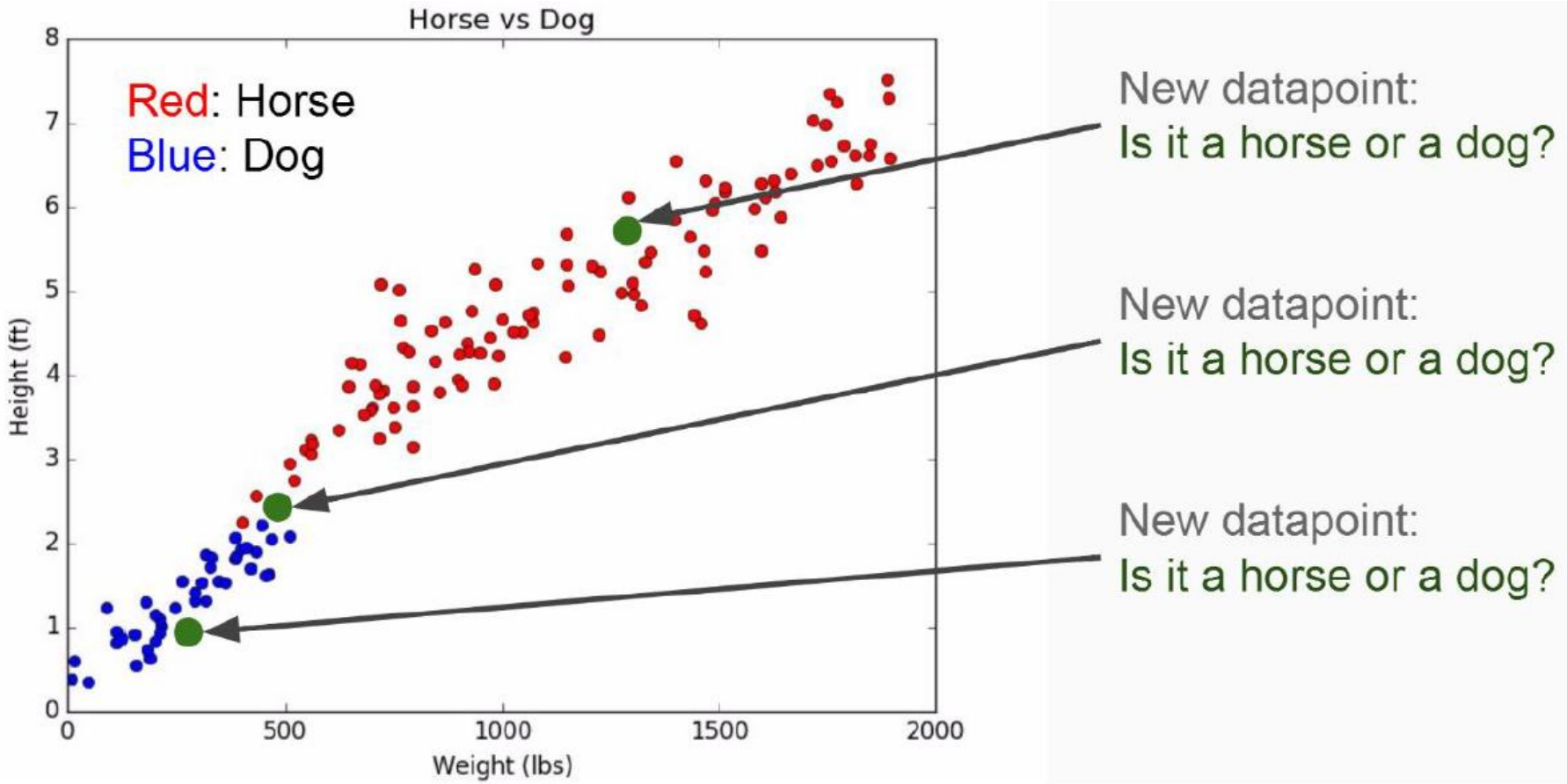
KNN

- K Nearest Neighbors is a **classification** algorithm that operates on a very simple principle.
- It is best shown through example!
- Imagine we had some imaginary data on Dogs and Horses, with heights and weights.

KNN



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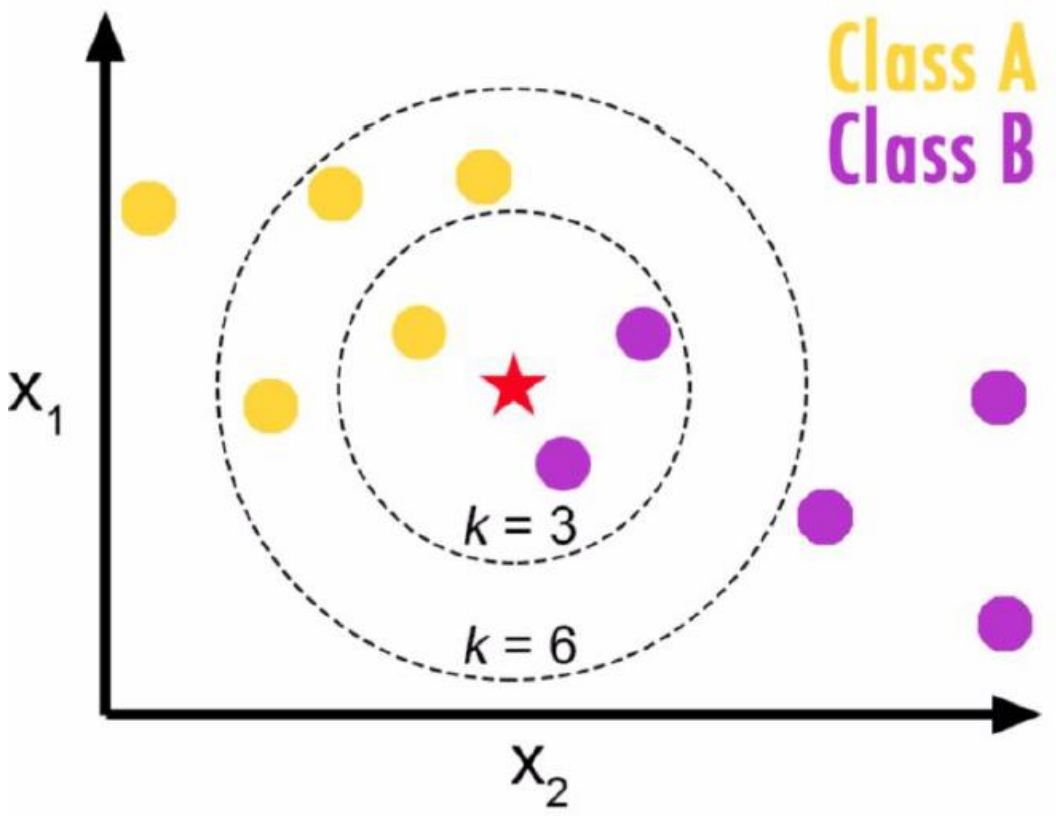
KNN

- Training Algorithm:
  1. Store all the Data
- Prediction Algorithm:
  1. Calculate the distance from x to all points in your data
  2. Sort the points in your data by increasing distance from x
  3. Predict the majority label of the “k” closest points

KNN

Choosing a K will affect what class a new point is assigned to:



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KNN

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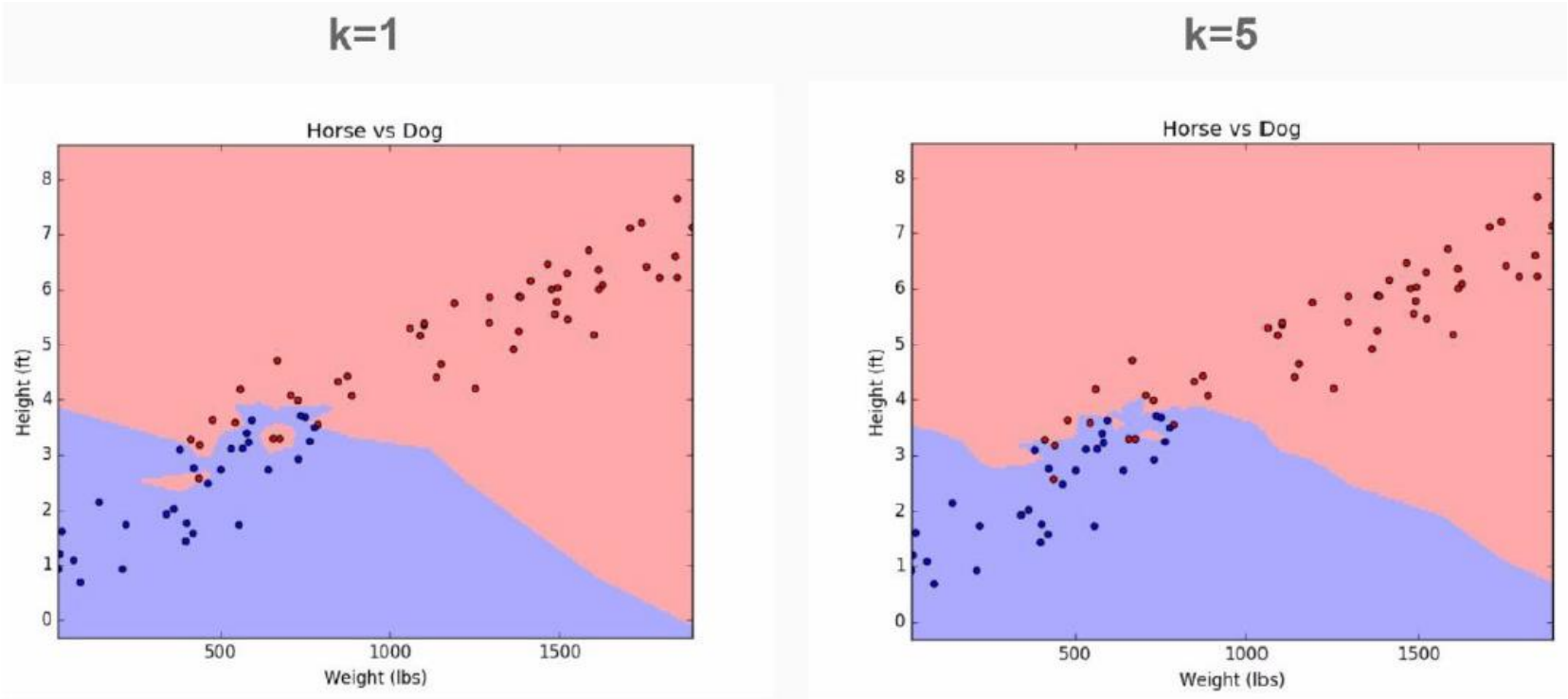

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KNN

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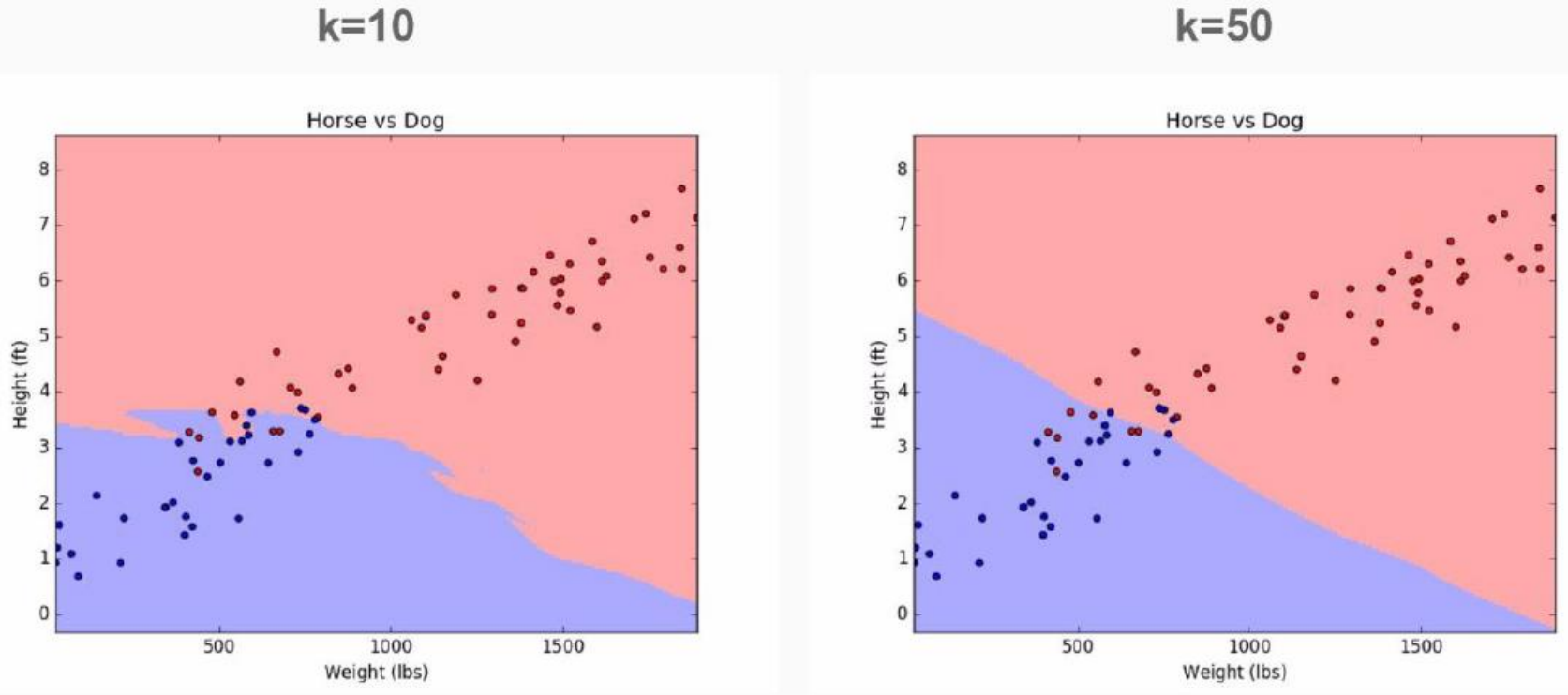

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KNN

Pros

- Very simple
- Training is trivial
- Works with any number of classes
- Easy to add more data
- Few parameters
  - K
  - Distance Metric

KNN

Cons

- High Prediction Cost (worse for large data sets)
- Not good with high dimensional data
- Categorical Features don’t work well

Lets Practice with Python!

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