Python102

Python for Data Science Bootcamp

(6) Introduction to Machine Learning

AIAT Academy

Introduction to Machine Learning

- Textbook
  - Introduction to Statistical Learning by Gareth James

    http://www-bcf.usc.edu/~gareth/ISL/index.html

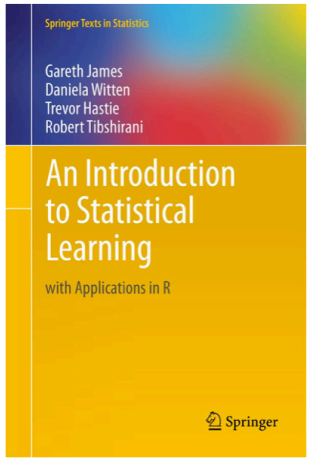
An Introduction to Statistical Learning

with Applications in R

Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani

Home
About this Book
R Code for Labs
Data Sets and Figures
ISLR Package
Get the Book
Author Bios

Errata



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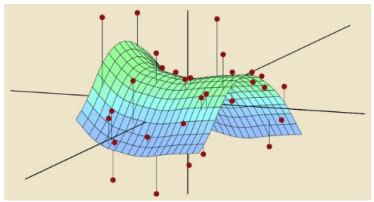

Statistical Learning MOOC covering the entire ISL book offered by Trevor Hastie and Rob Tibshirani. Start anytime in self-paced mode.

Download the book in PDF format here

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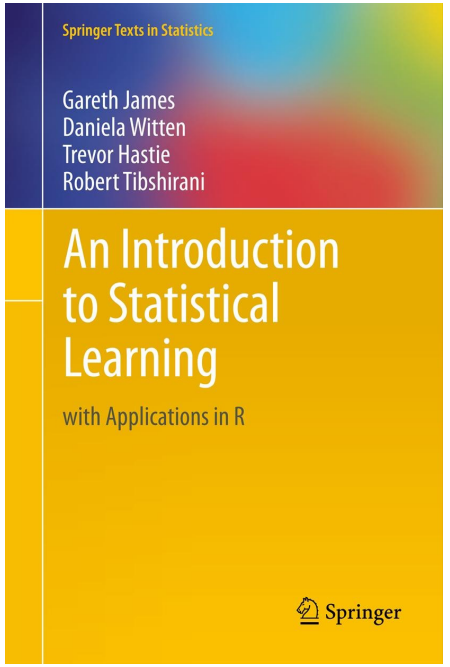
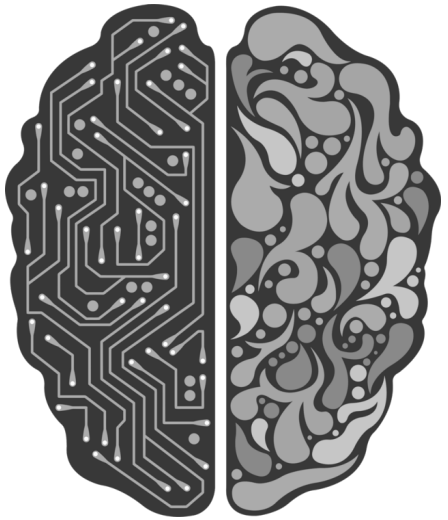


Introduction to Machine Learning

- Machine Learning (ML) is a method of **data analysis** that **automates** analytical model building
- Using algorithms that **iteratively learning** from data to **find hidden insights** in the data



Introduction to Machine Learning

- What is it used for?
  - License plate recognition
  - Optical Character Recognition (OCR)
  - Recommendation Systems

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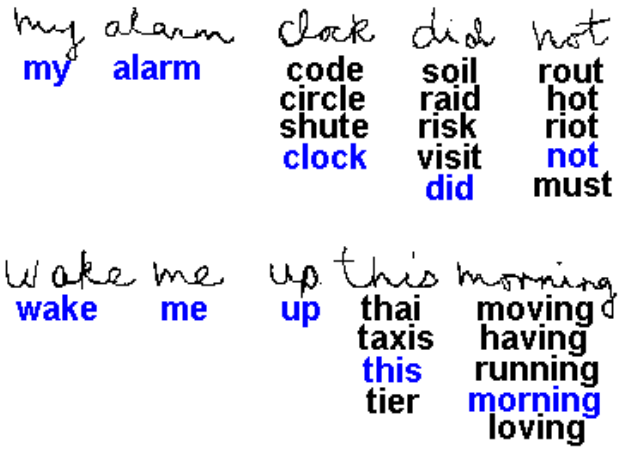
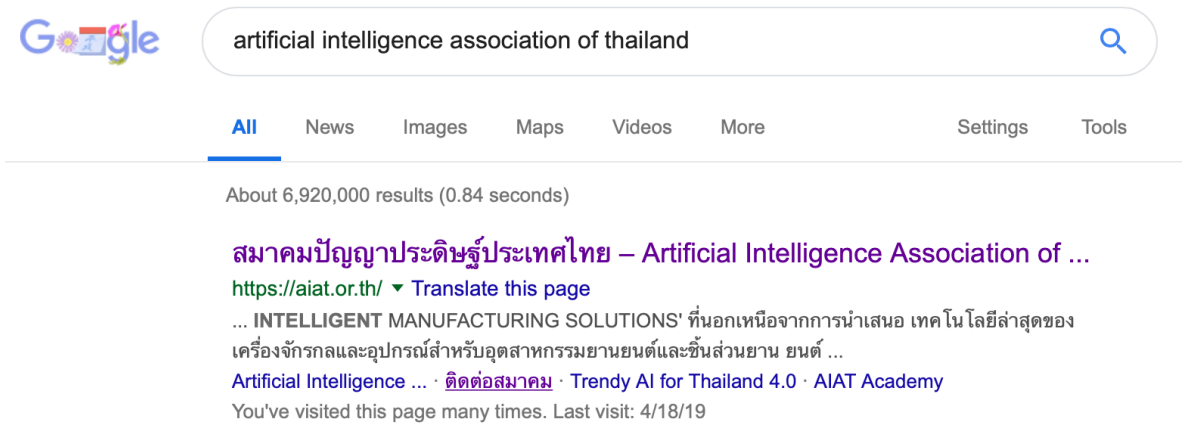
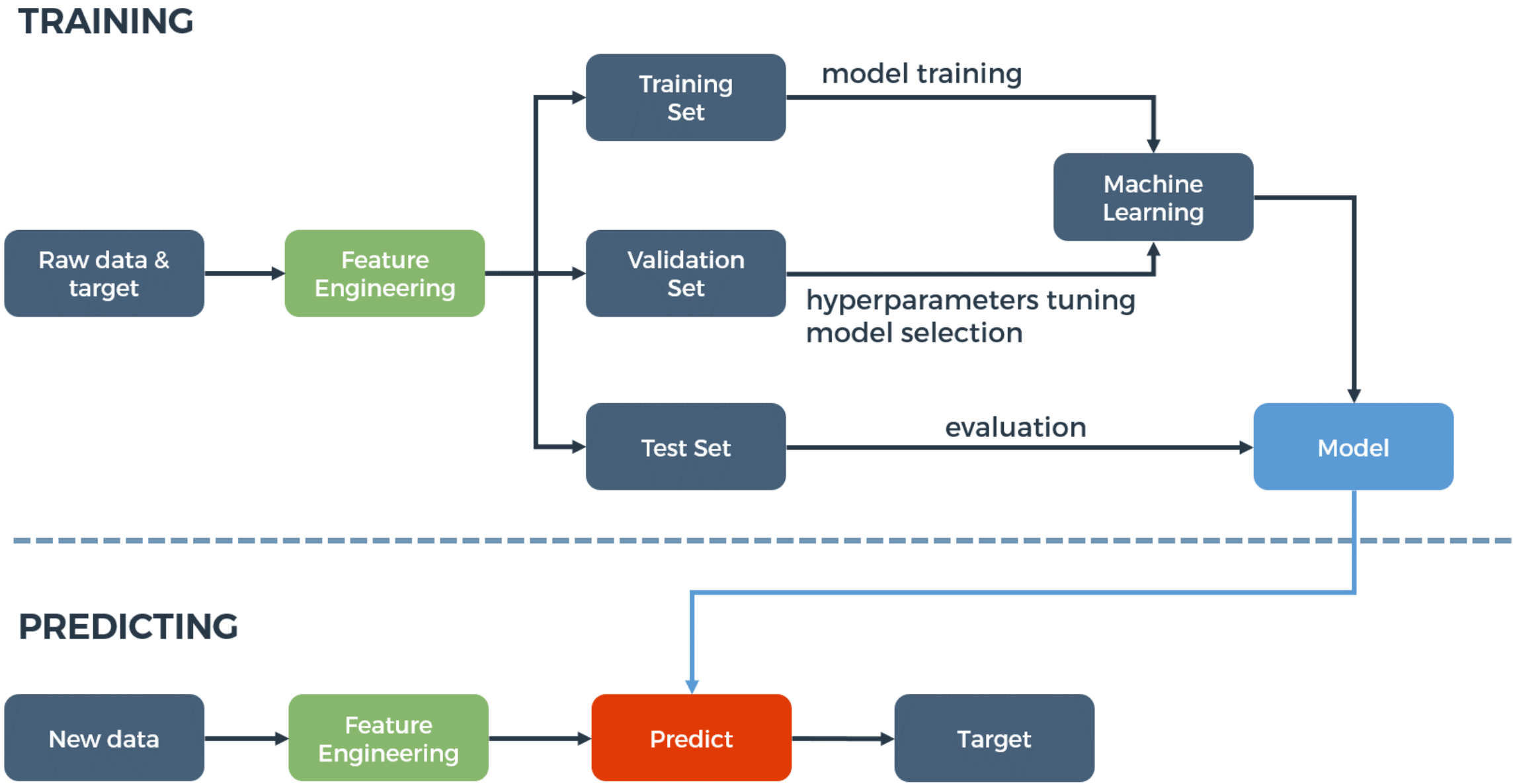




Introduction to Machine Learning (Process)



Introduction to Machine Learning

- 3 main types of ML algorithms
  - Supervised Learning
  - Unsupervised Learning
  - Reinforcement Learning

Introduction to Machine Learning

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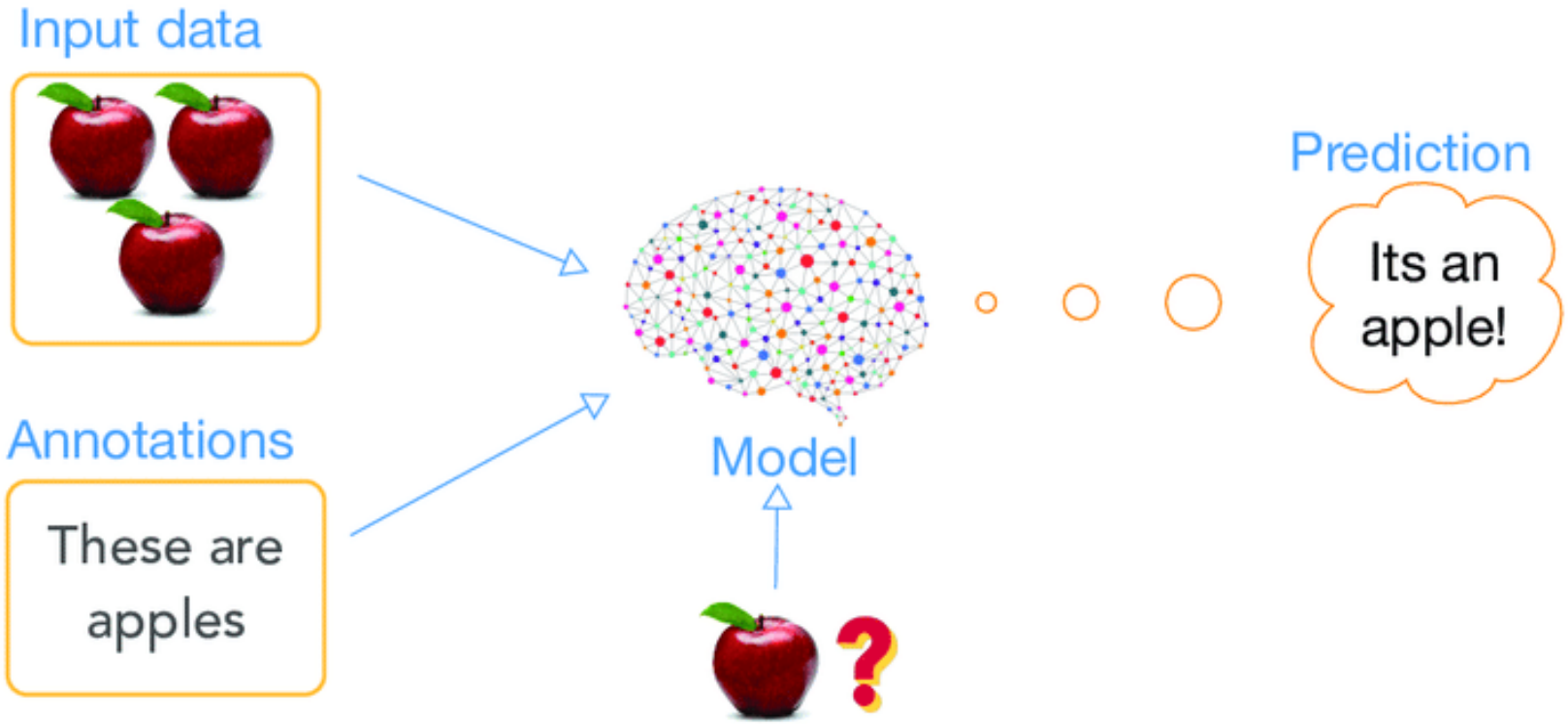
- Supervised Learning
  - You have **labelled data** and trying to **predict** a label on new data
- Unsupervised Learning
  - You have **unlabelled data** and trying to **group together similar** data points
- Reinforcement Learning
  - Algorithm **learns** to perform an action **from experience**

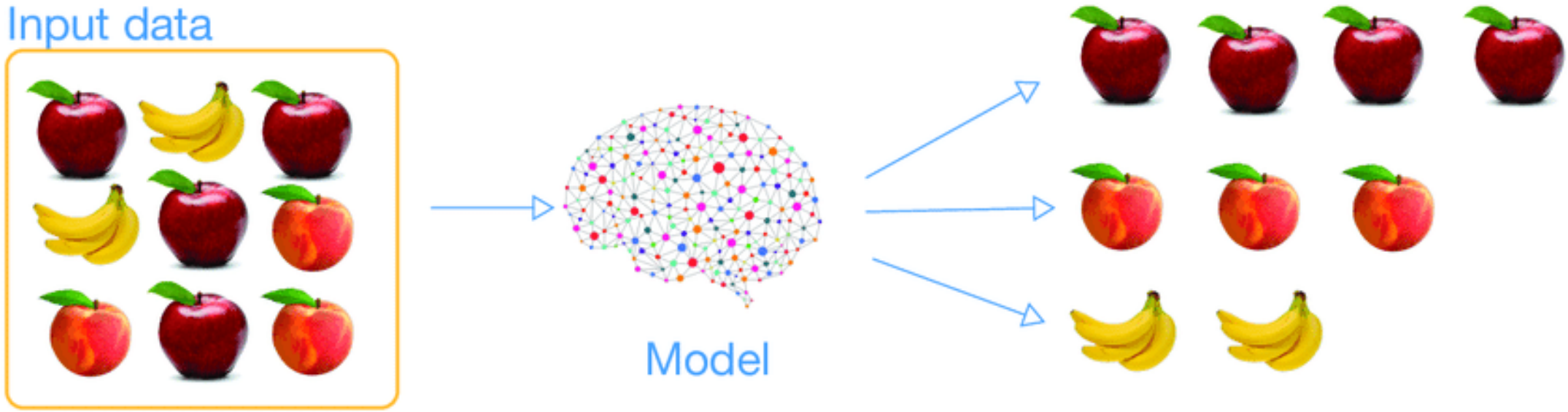
Introduction to Machine Learning

- **Supervised Learning** algorithms are trained using **labelled** example (an input that we know desired output)
- Supervised learning is commonly used in application where historical data predicts likely future events (**Classification**)



Introduction to Machine Learning

- **Unsupervised Learning** is used for data that has no labels
- The system is not told the **right answer** bit explore the data and fine some structure for **grouping (Clustering)**



Introduction to Machine Learning

- **Reinforcement Learning** is often used for robotics, gaming and navigation
- The algorithm discovers through trial and error which action yield the greatest reward