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

  - https://github.com/JWarmenhoven/ISLR-python

An Introduction to Statistical Learning

with Applications in R

Gareth James, **Daniela Witten**, **Trevor Hastie** and **Robert Tibshirani**

Home
About this Book
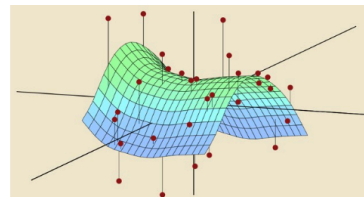**R Code for Labs**
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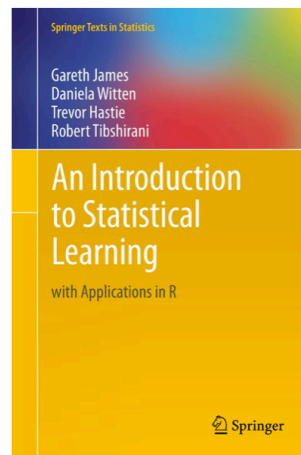
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Statistical Learning MOOC covering the entire ISL book offered by Trevor Hastie and Rob Tibshirani. Start anytime in self-paced mode.

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An Introduction to Statistical Learning

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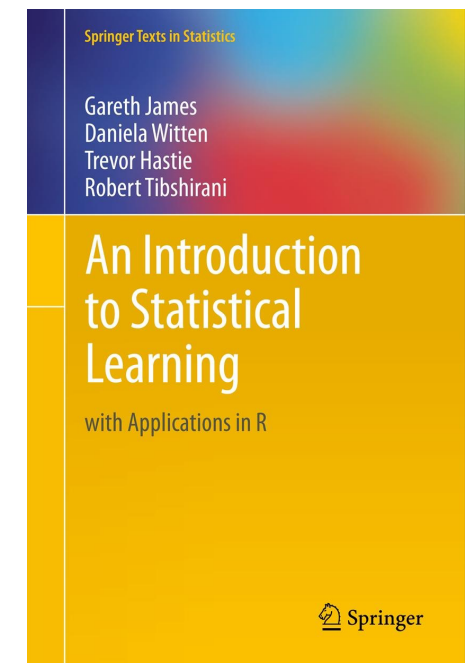
Introduction to Machine Learning

- 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
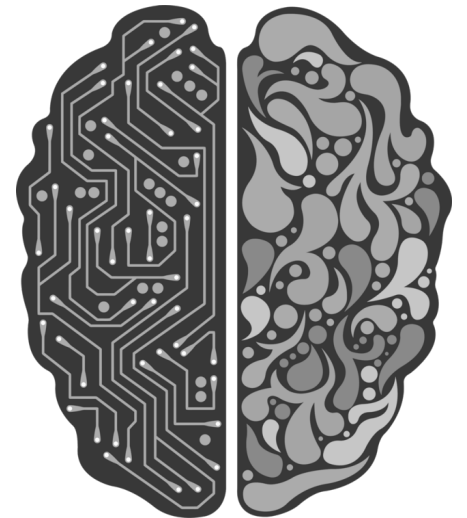
Introduction to Machine Learning

- What is it used for?

  - License plate recognition

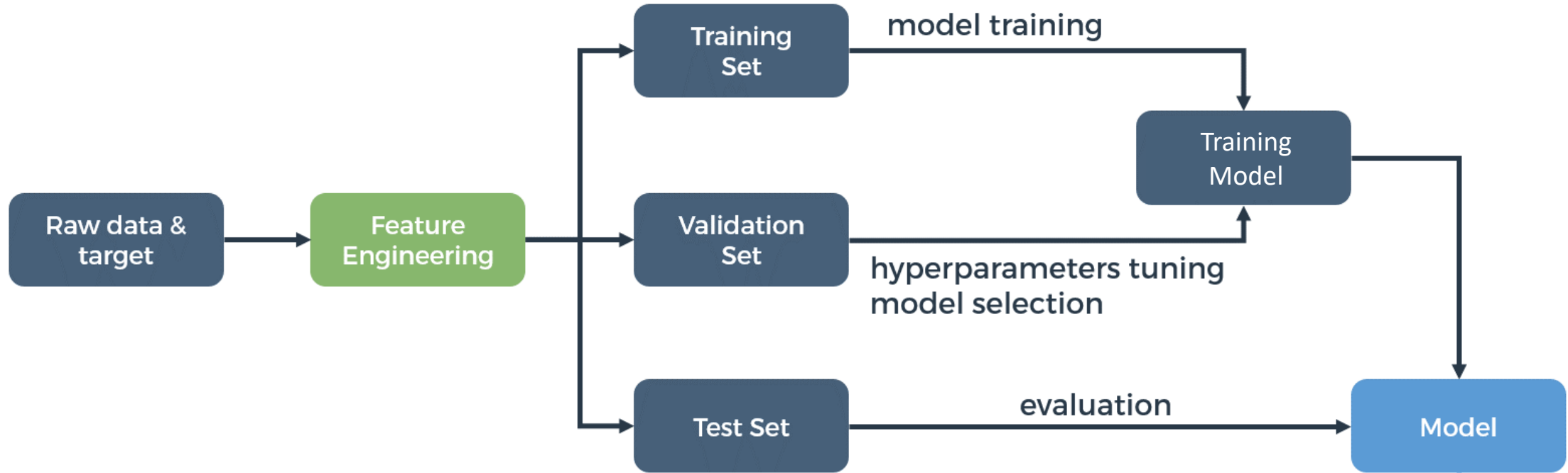 - Optical Character Recognition (OCR)

  - Recommendation Systems
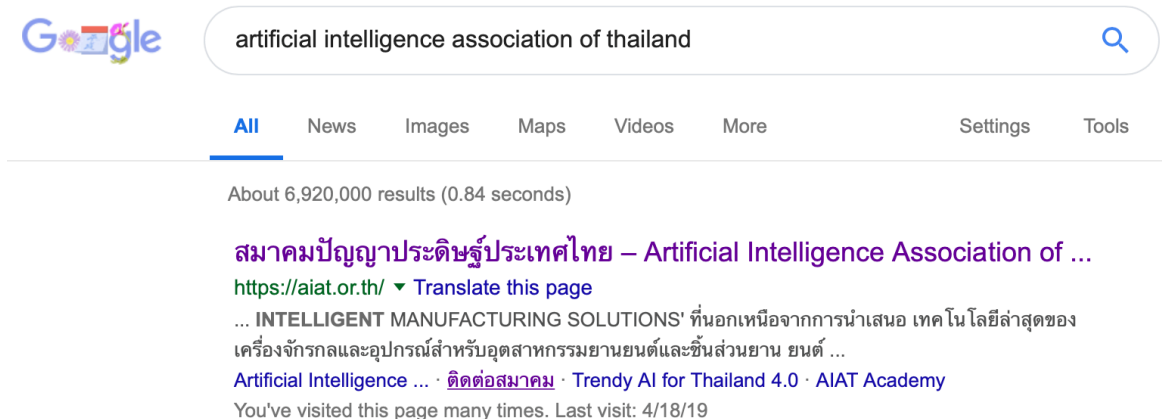
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Introduction to Machine Learning (Process)
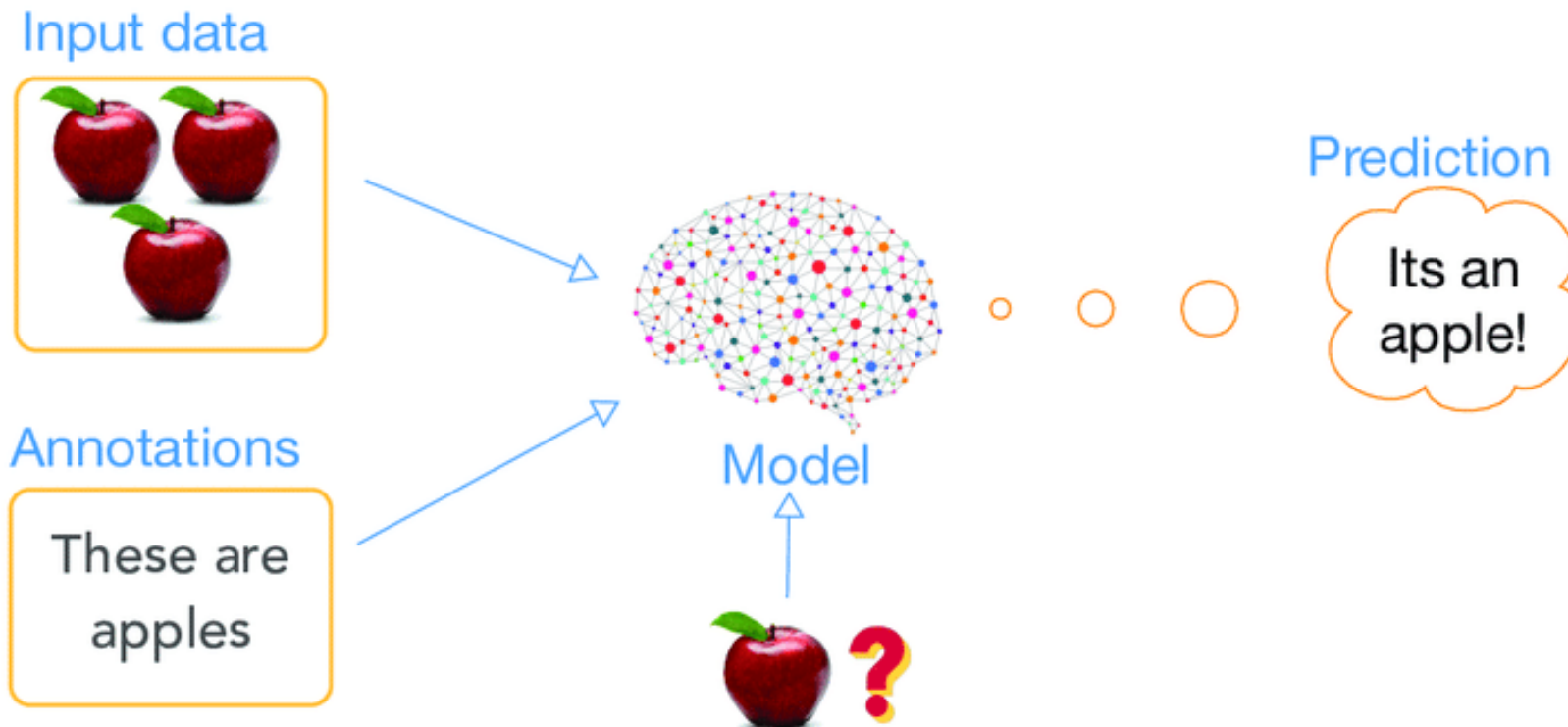
Introduction to Machine Learning

- 3 main types of ML algorithms

    - Supervised Learning

    - Unsupervised Learning

    - Reinforcement Learning

Introduction to Machine Learning

- 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**)
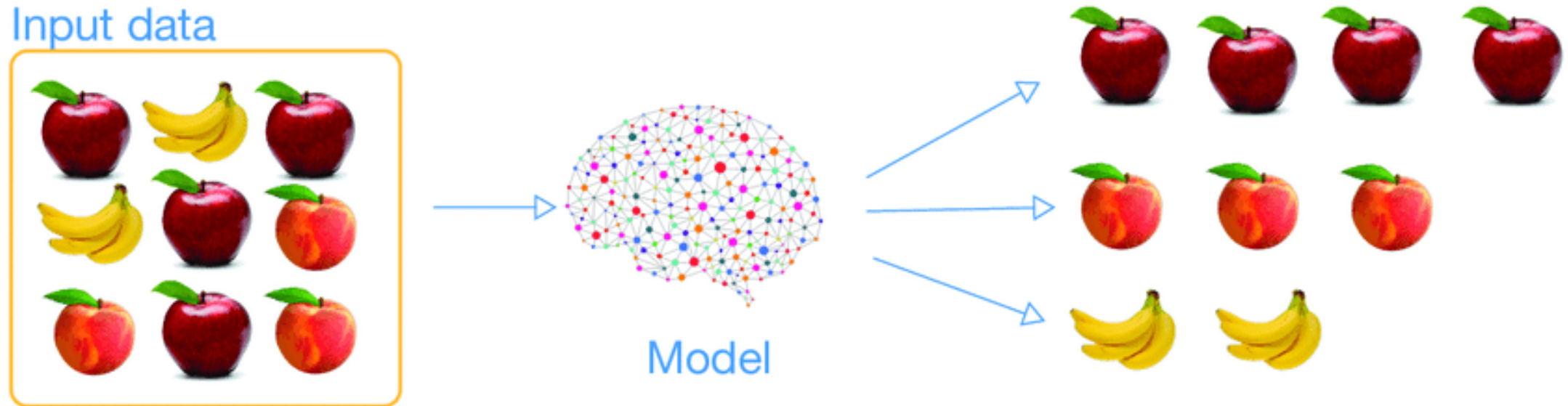
Introduction to Machine Learning

- **Reinforcement Learning** is often used for robotics, gaming and navigation

- The algorithm discovers through trial and error which action yield the greatest reward

GO + POSITIVE ODOUR (REWARD)   GO + NEGATIVE ODOUR (PUNISHMENT)   NO-GO + POSITIVE ODOUR (NO-PUNISHMENT NO-REWARD)   NO-GO + NEGATIVE ODOUR (NO-PUNISHMENT NO-REWARD)