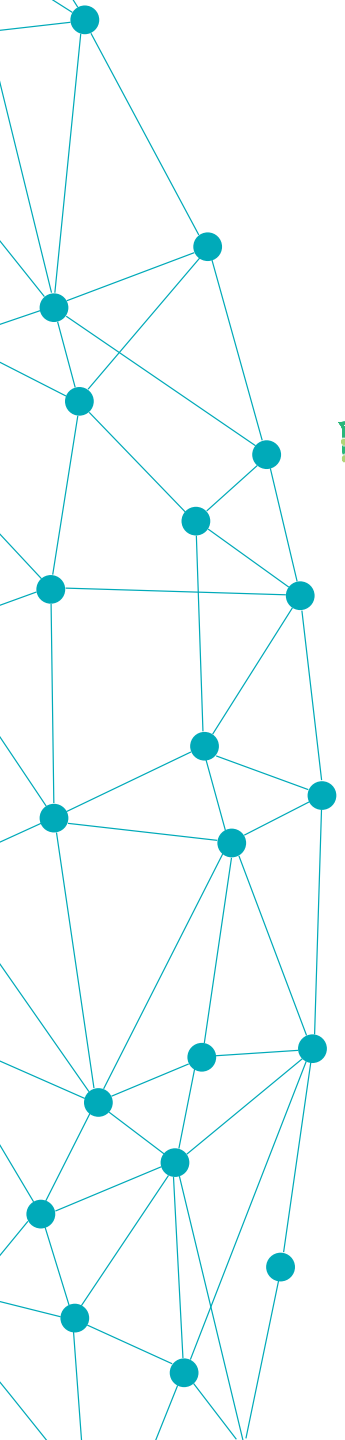
Infofarm

Machine Learning with Python

PXL i-Talent



Overview

- Introduction
  - What is Machine Learning
  - Practical exercises

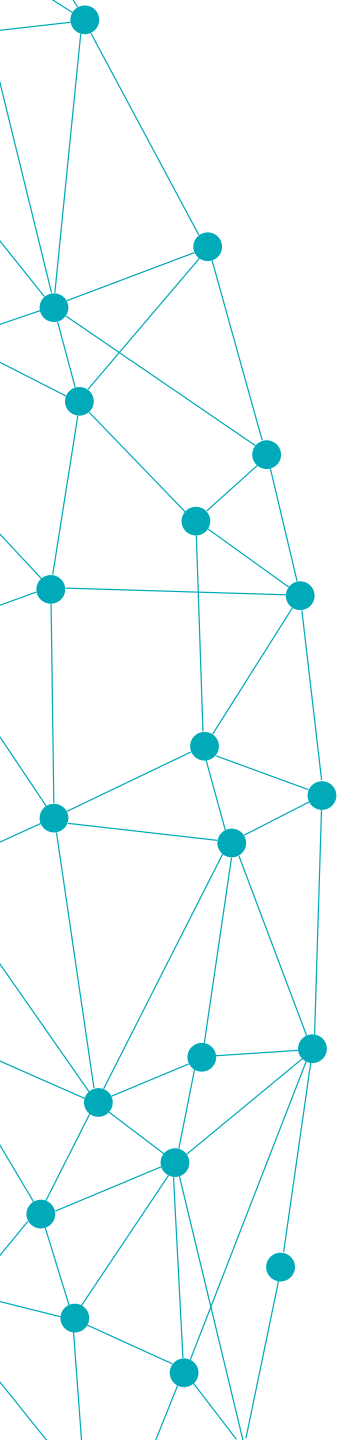
About us

Dr. Glenn Cich

- Master Computer Science
  PhD Mobility Sciences
- Data/Software Engineer

Lorenz Feyen

- Master Nuclear Physics
- Data Scientist



What is InfoFarm?

- Data Science company
- Help customers find insights and business value in their data
- Analysis & implementations
- 7 data scientists, 6 data engineers
- Located in Hasselt, Merelbeke & Kontich

Infofarm

We harvest business value

OUR PASSION

Plow data – Grow information – Harvest value

Data Science

Applied Artificial Intelligence services, Machine Learning & Deep Learning techniques

Big Data

Setting up and maintaining on-premise and Cloud-based Big Data architectures with Apache Spark and Hadoop

Training & Workshops

YOU ARE HERE

Training and guiding organisations through the digital era using the power of Data Science

Powered by

CRONOS GROEP

XPLORE GROUP

Infofarm

What is InfoFarm?

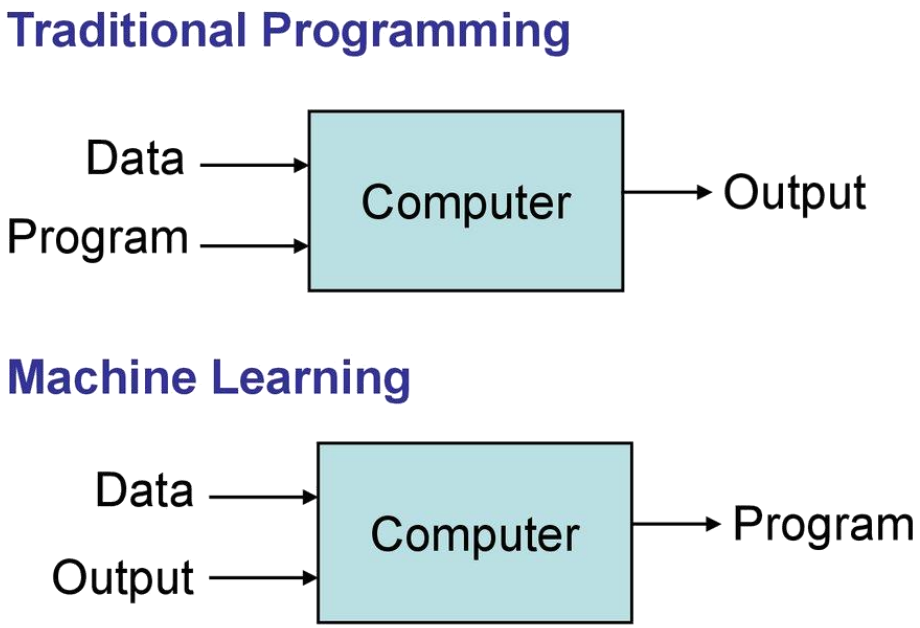
- Part of Xplore Group
  - Mobile development
  - Web development
  - E-commerce
  - Lots of partner companies for InfoFarm
- Part of Cronos Group
  - Largest independent IT services supplier in Belgium
  - 6000+ Consultants

InfoFarm customers

What is Machine Learning?

Machine Learning: Concept

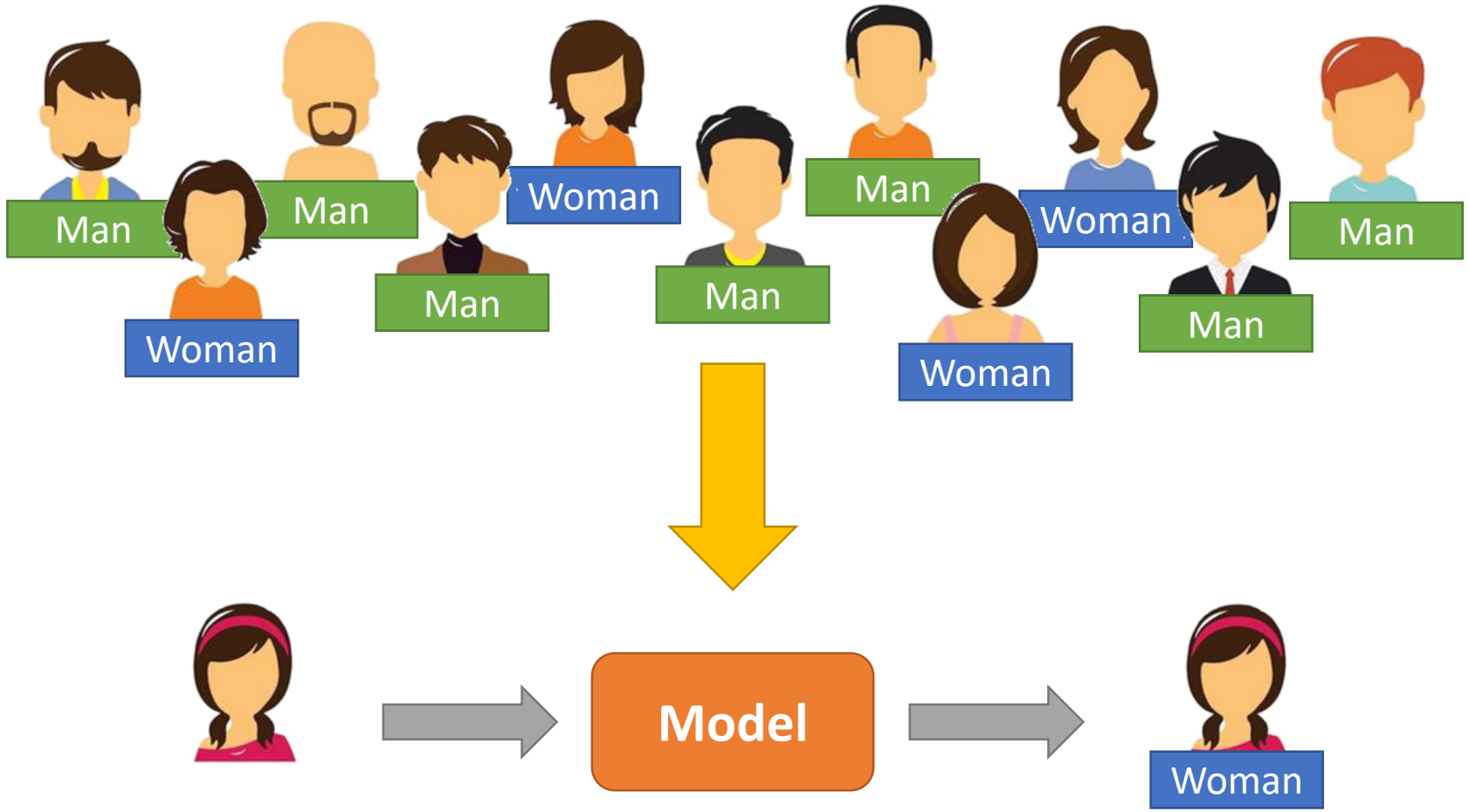
- Learn and make predictions on data
- No instructions for single cases
- behavior is determined from past data



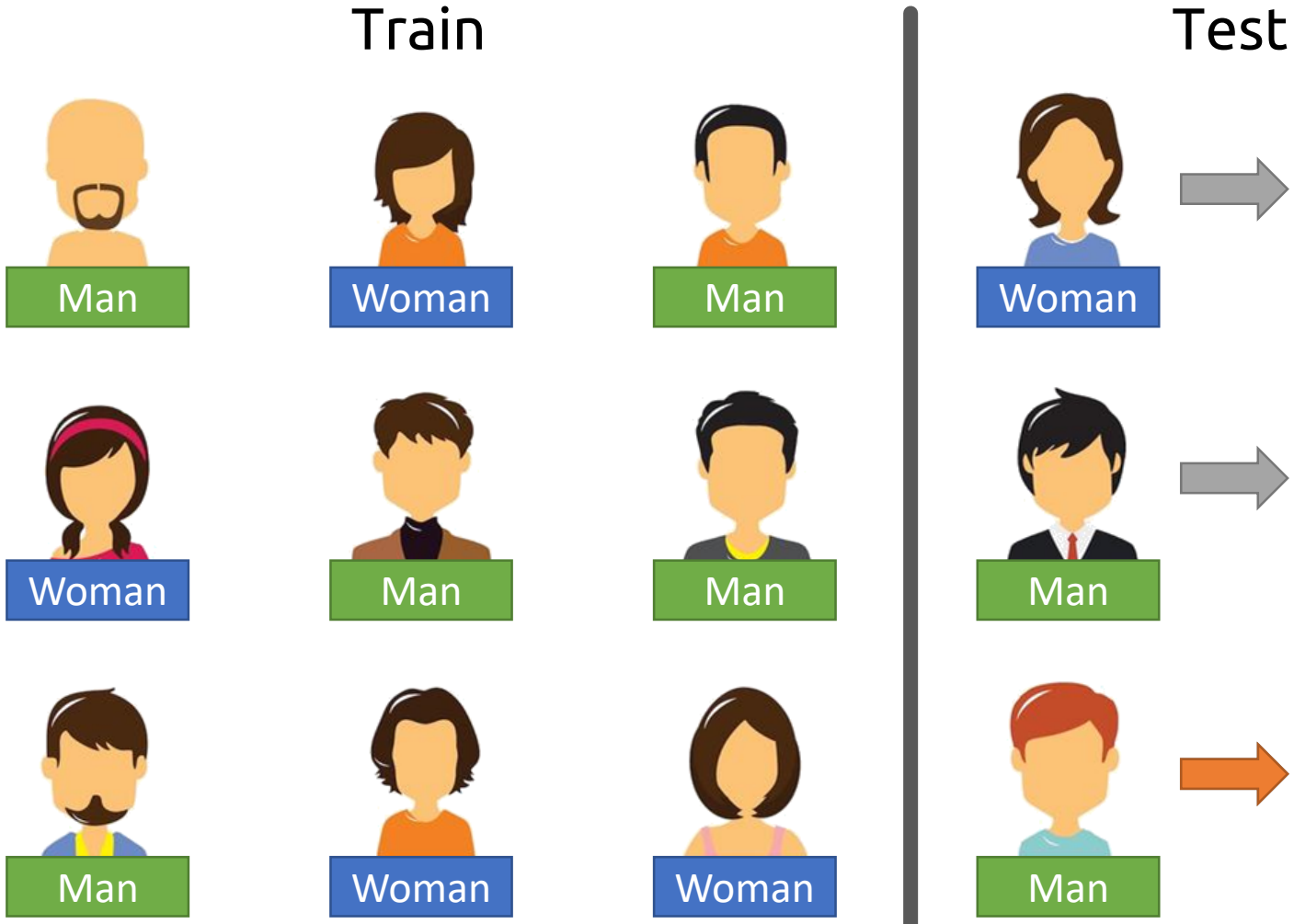
Machine Learning: Features

	Gender	Age	Height (cm)	Hair color
	Man	24	184	Black
	Woman	27	169	Brown
	Man	19	192	Red
	Woman	15	155	Brown

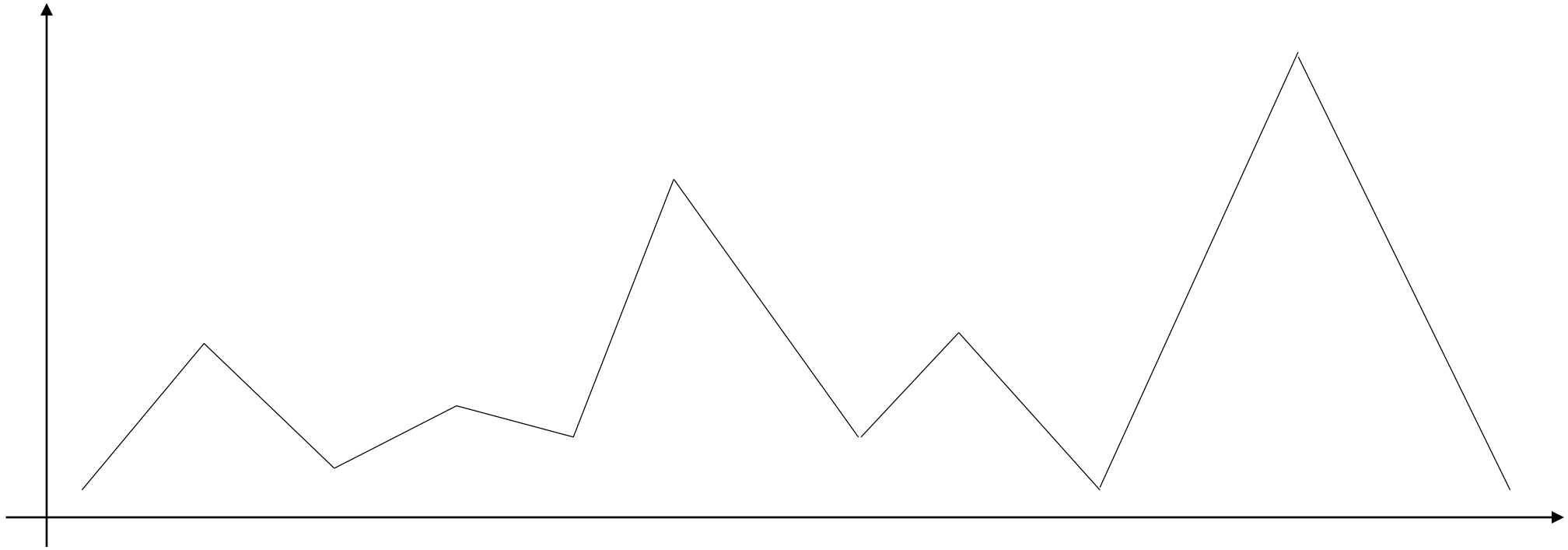
Machine Learning: Supervised



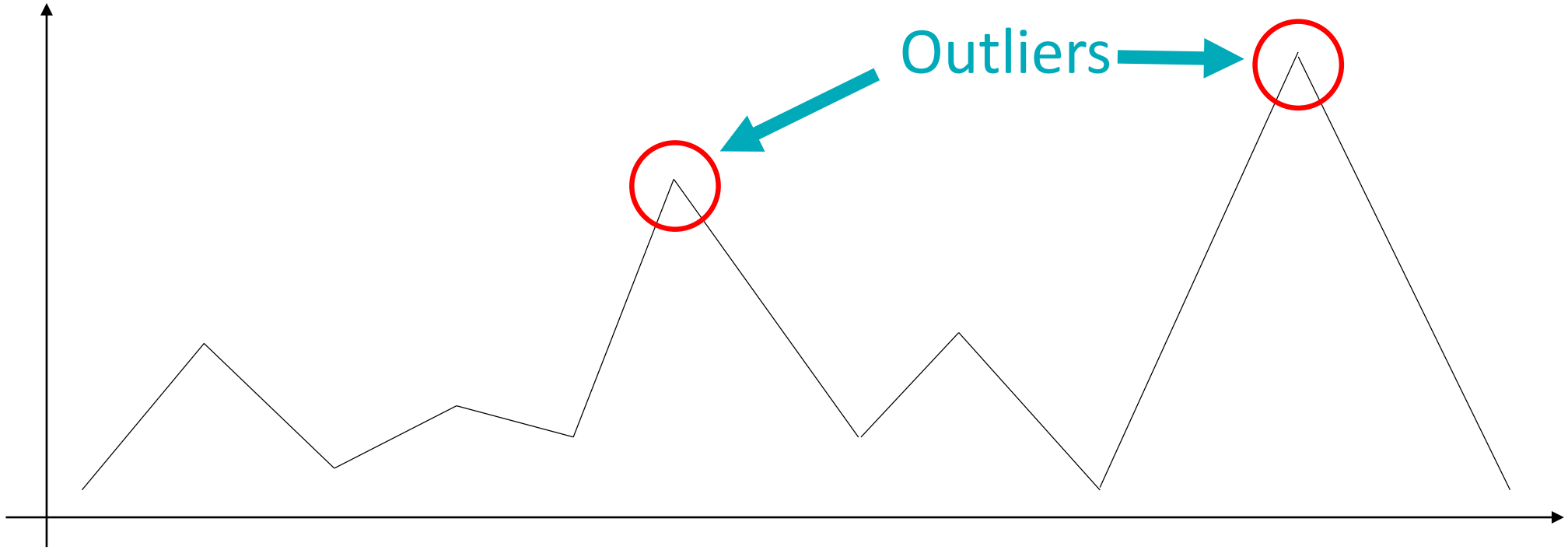
Machine Learning: Train and Test



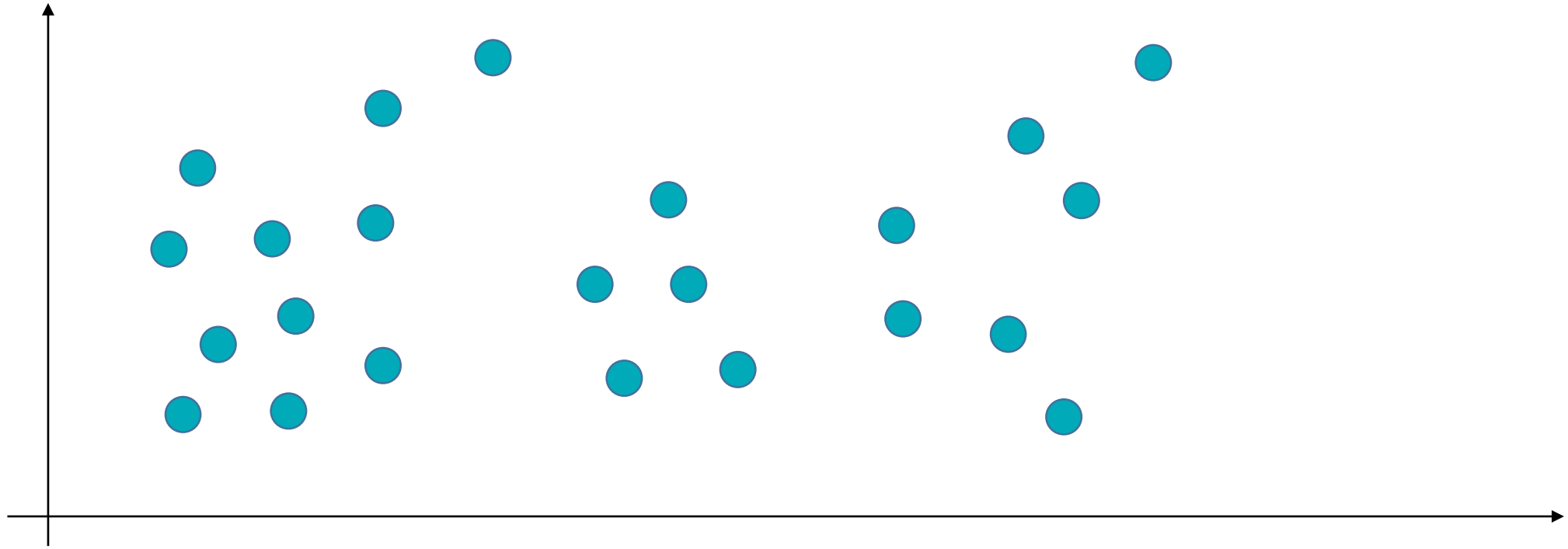
Machine Learning: Unsupervised



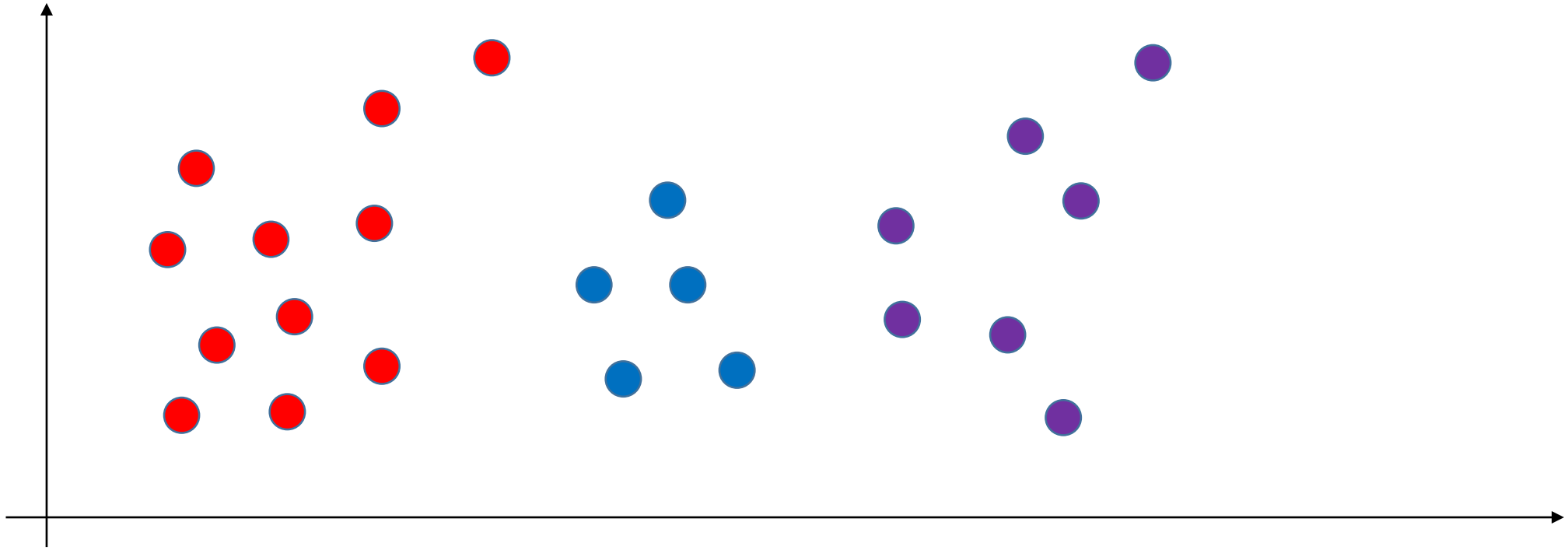
Machine Learning: Unsupervised



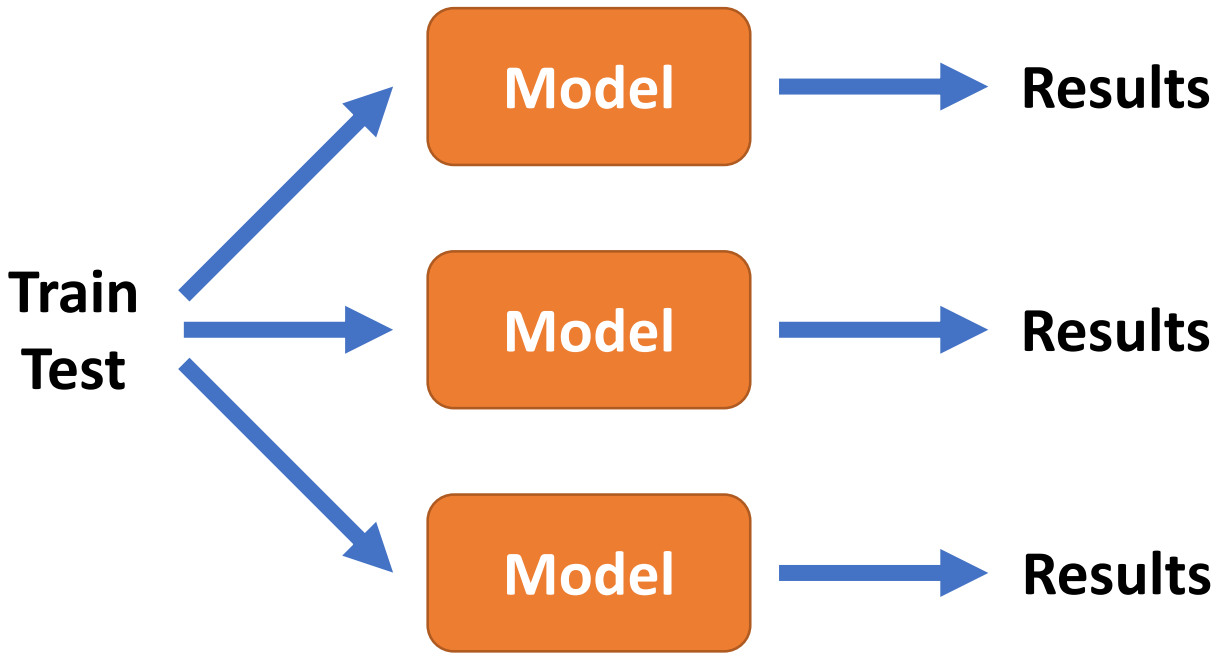
Machine Learning: Unsupervised



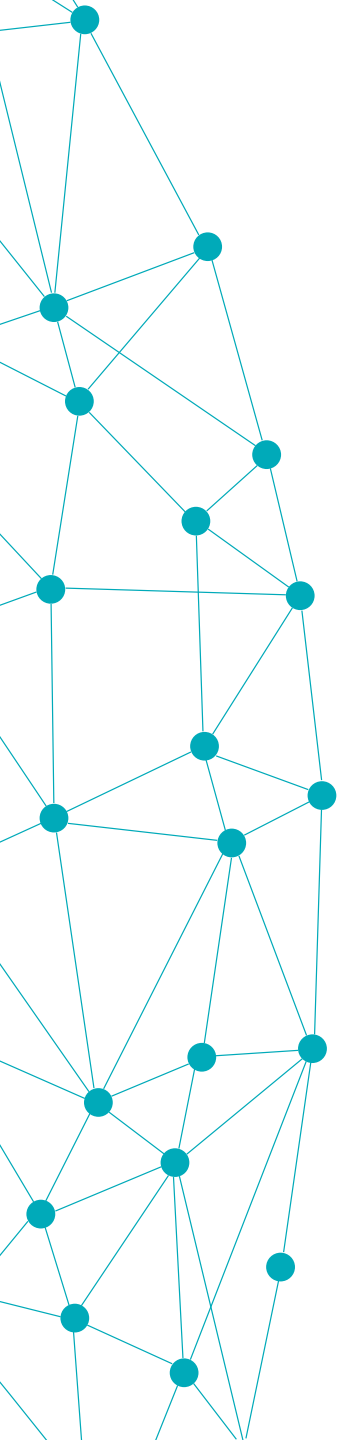
Machine Learning: Unsupervised



Machine Learning: Models



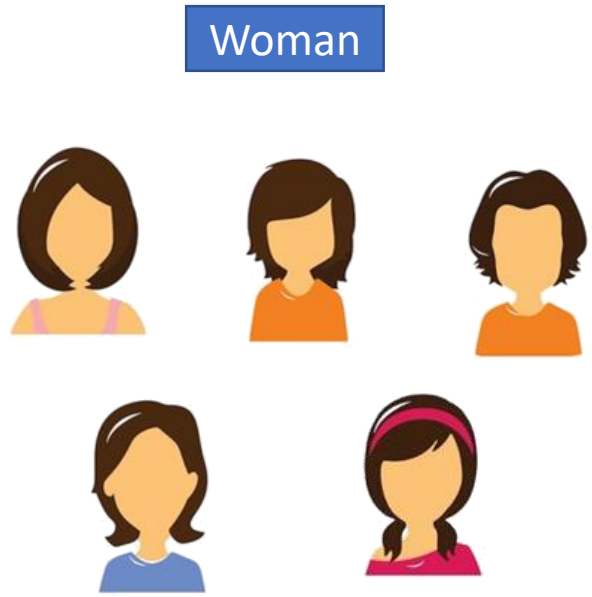
Classification



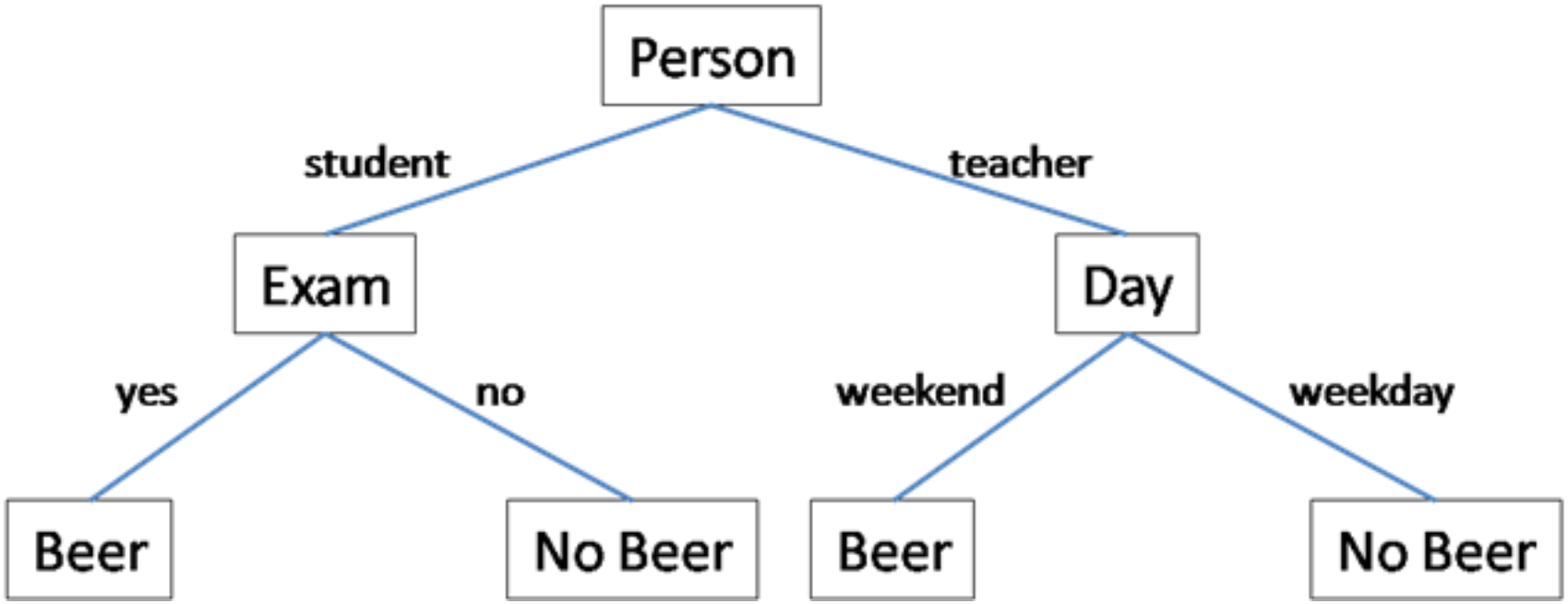
Machine Learning: Models

Supervised	Unsupervised
Classification	**Clustering**
Regression	**Collaborative filtering**

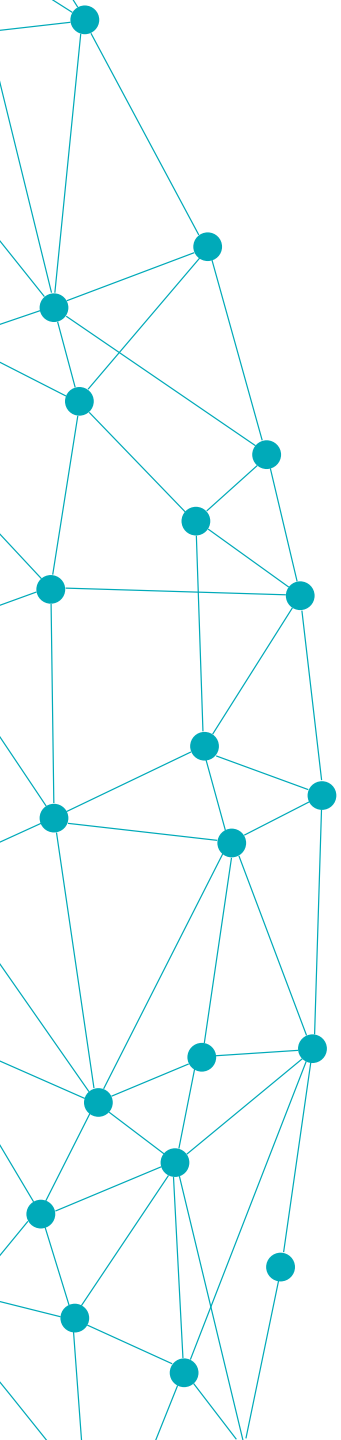
Machine Learning: Classification



Classification: Decision Tree



Regression



Machine Learning: Models

Supervised	Unsupervised
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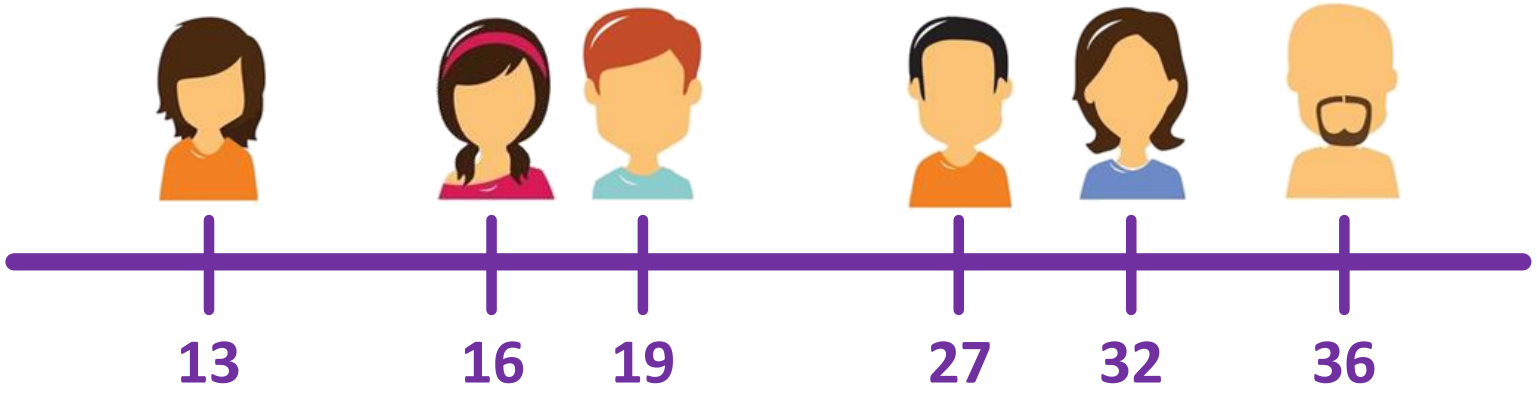
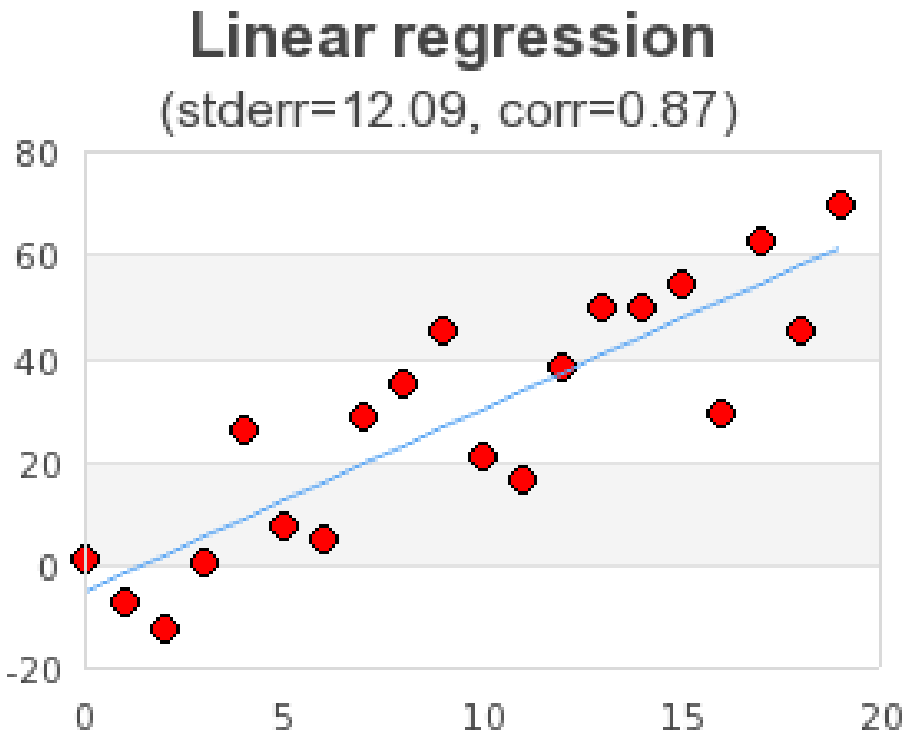
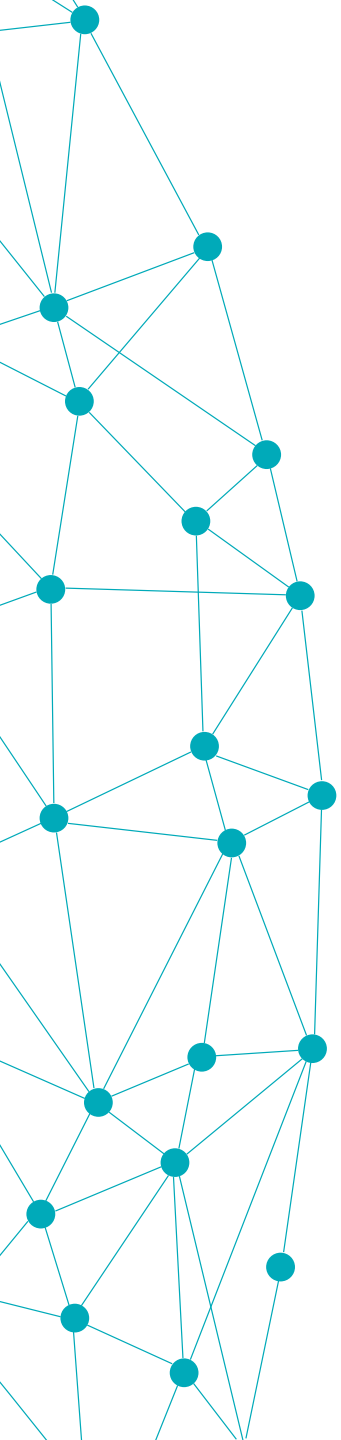
Machine Learning: Regression



Regression: Linear Regression



Clustering



Machine Learning: Models

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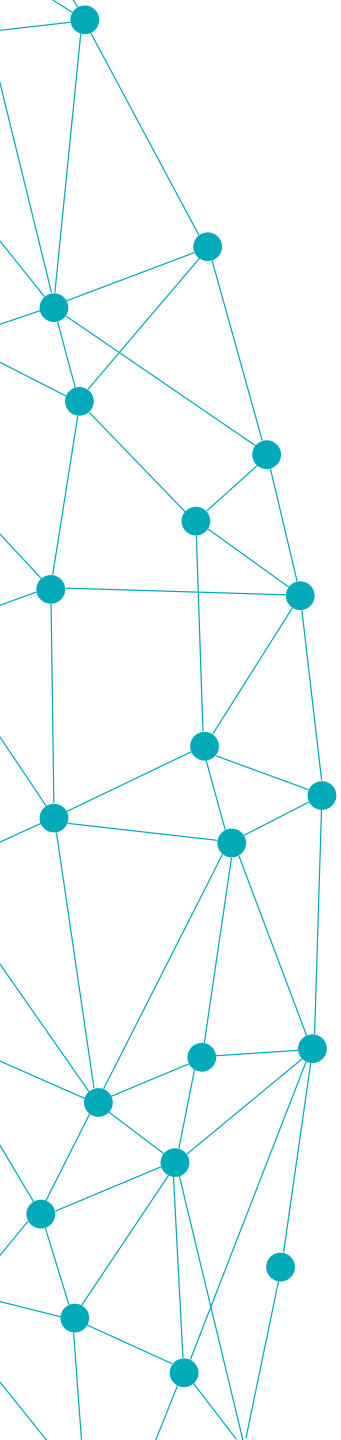
Machine Learning: Clustering

Collaborative filtering



Machine learning: Models

Supervised	Unsupervised
Classification	**Clustering**
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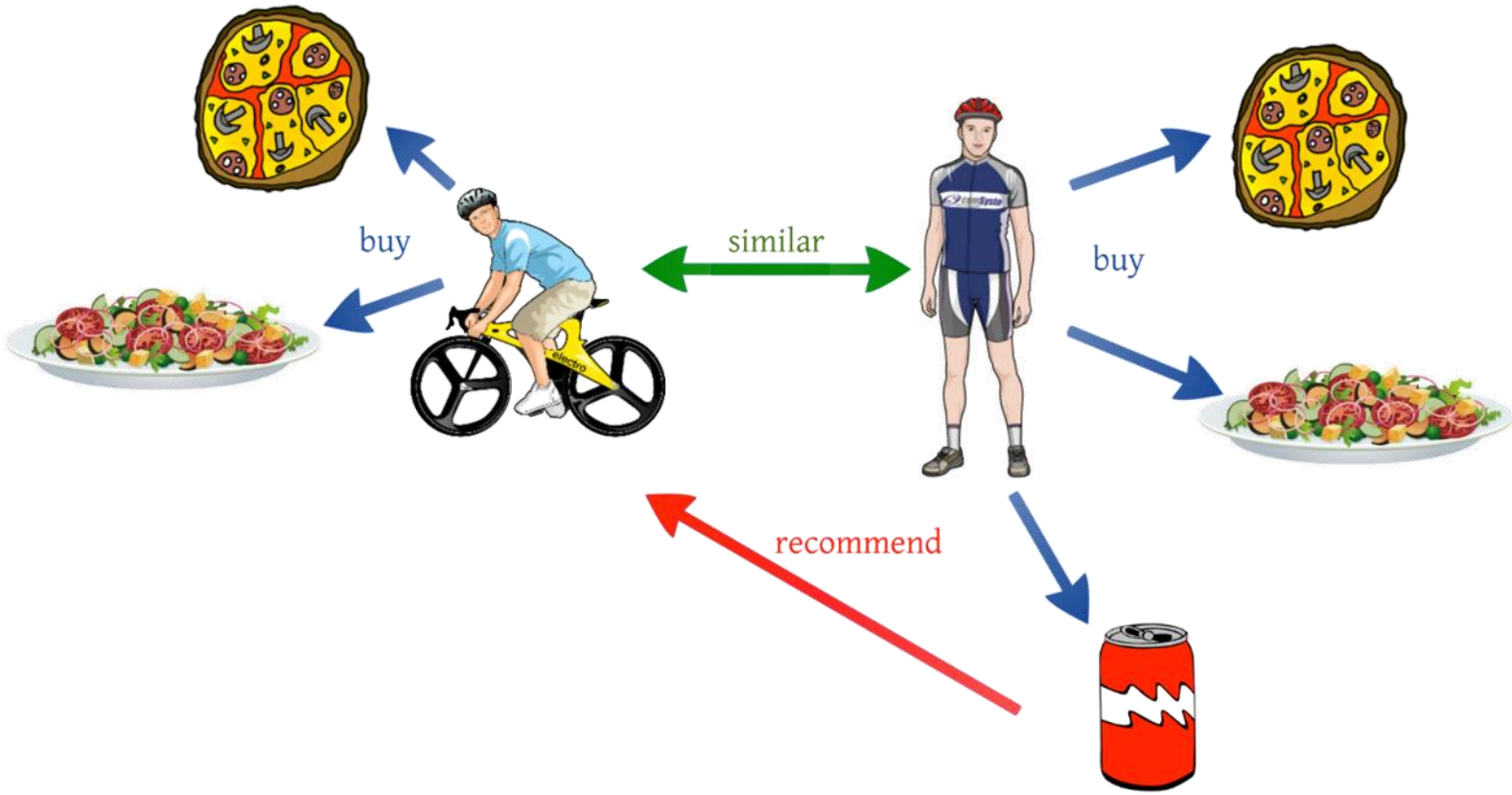
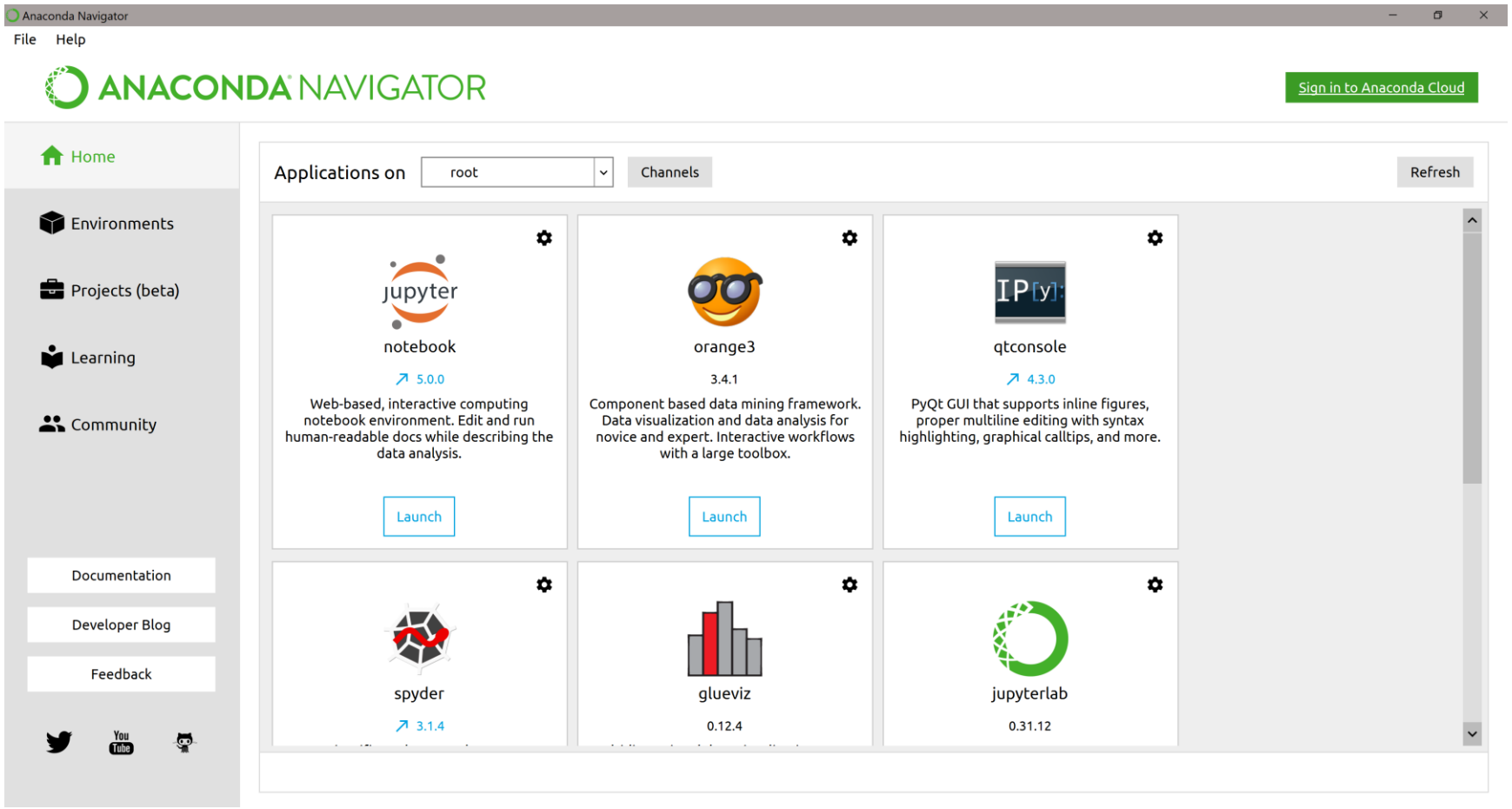
Filtering: User-based filtering

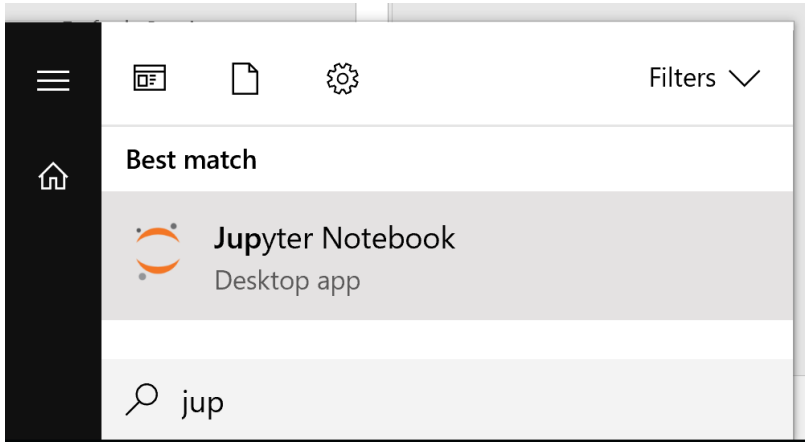


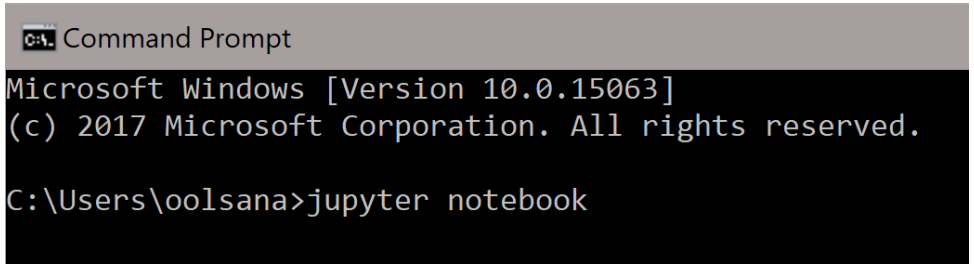
Jupyter Notebook

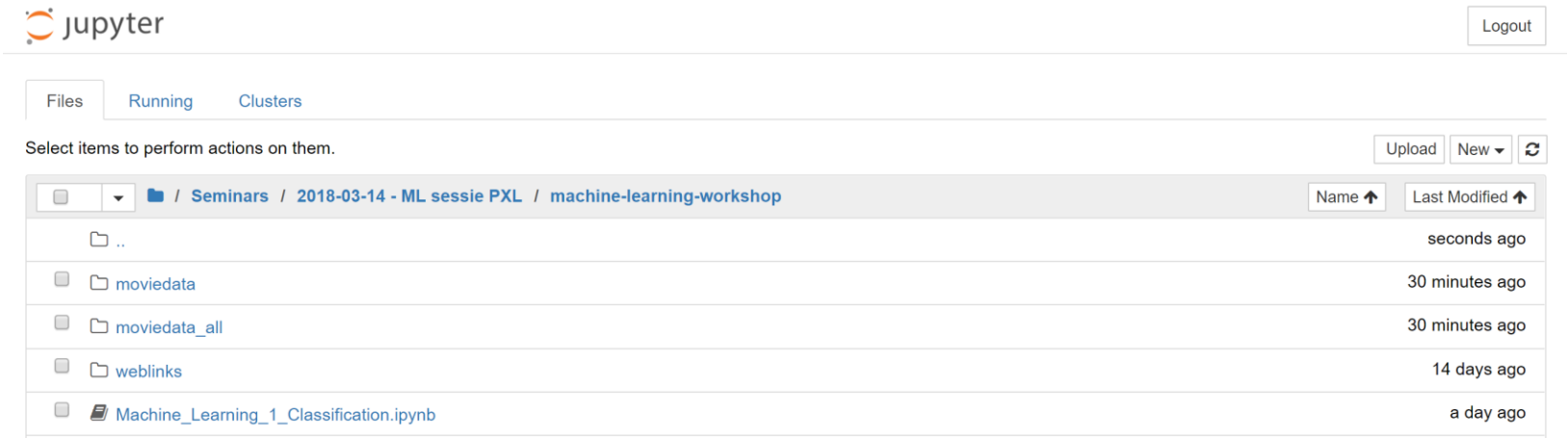
Installing Jupyter notebook



Starting Jupyter notebooks





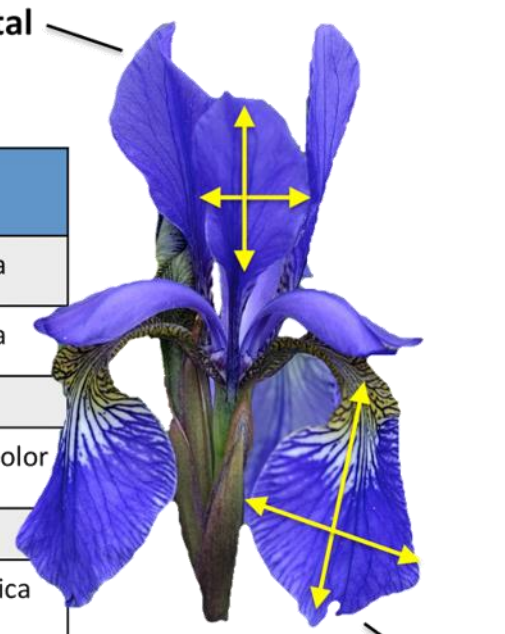


Exercise 1: Classification

Classification: Iris dataset

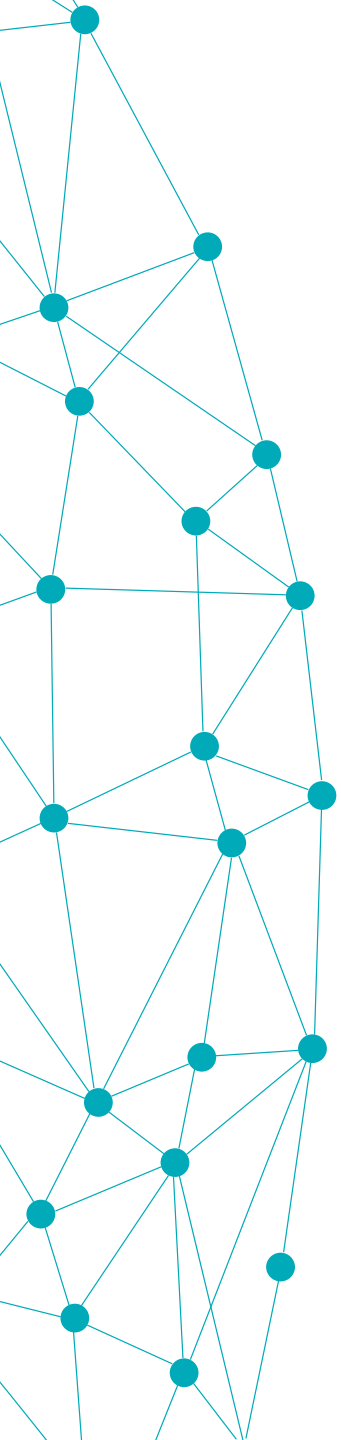
Samples
(instances, observations)

	Sepal length	Sepal width	Petal length	Petal width	Class label
1	5.1	3.5	1.4	0.2	Setosa
2	4.9	3.0	1.4	0.2	Setosa
...					
50	6.4	3.5	4.5	1.2	Versicolor
...					
150	5.9	3.0	5.0	1.8	Virginica



Features
(attributes, measurements, dimensions)

Class labels
(targets)



Machine Learning: Models

Supervised	Unsupervised
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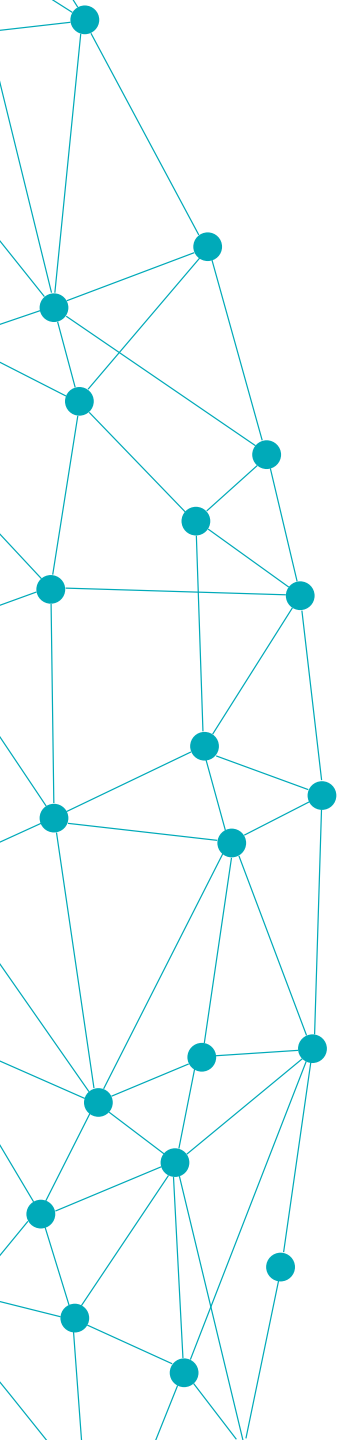
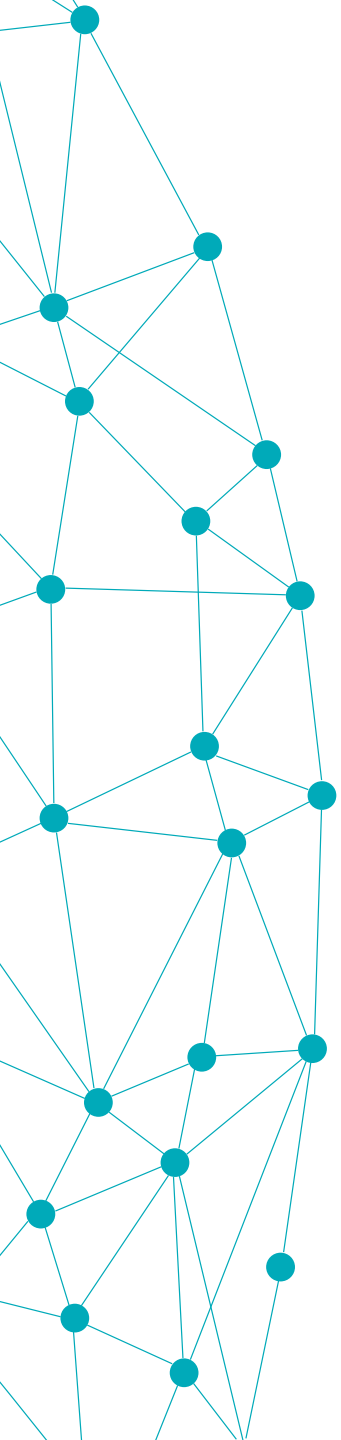
Exercise 2: Regression



Regression: Boston dataset

	CRIM	ZN	INDUS	CHAS	NOX	RM	AGE	DIS	RAD	TAX	PTRATIO	B	LSTAT
0	0.00632	18.0	2.31	0.0	0.538	6.575	65.2	4.0900	1.0	296.0	15.3	396.90	4.98
1	0.02731	0.0	7.07	0.0	0.469	6.421	78.9	4.9671	2.0	242.0	17.8	396.90	9.14
2	0.02729	0.0	7.07	0.0	0.469	7.185	61.1	4.9671	2.0	242.0	17.8	392.83	4.03
3	0.03237	0.0	2.18	0.0	0.458	6.998	45.8	6.0622	3.0	222.0	18.7	394.63	2.94
4	0.06905	0.0	2.18	0.0	0.458	7.147	54.2	6.0622	3.0	222.0	18.7	396.90	5.33
5	0.02985	0.0	2.18	0.0	0.458	6.430	58.7	6.0622	3.0	222.0	18.7	394.12	5.21
6	0.08829	12.5	7.87	0.0	0.524	6.012	66.6	5.5605	5.0	311.0	15.2	395.60	12.43
7	0.14455	12.5	7.87	0.0	0.524	6.172	96.1	5.9505	5.0	311.0	15.2	396.90	19.15
8	0.21124	12.5	7.87	0.0	0.524	5.631	100.0	6.0821	5.0	311.0	15.2	386.63	29.93
9	0.17004	12.5	7.87	0.0	0.524	6.004	85.9	6.5921	5.0	311.0	15.2	386.71	17.10



Machine Learning: Models

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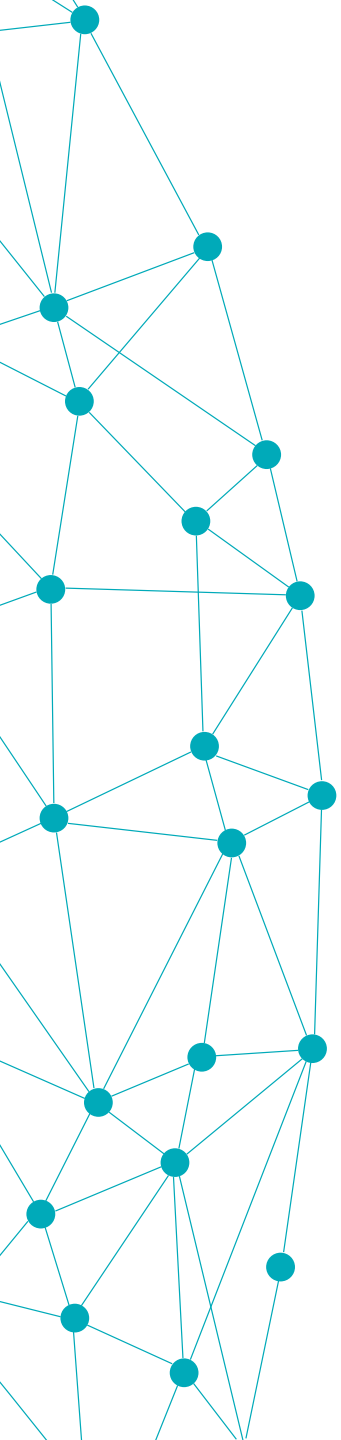
Exercise 3: Collaborative filtering

Filtering: movie reviews

Filtering: movie reviews



Machine learning: Models

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