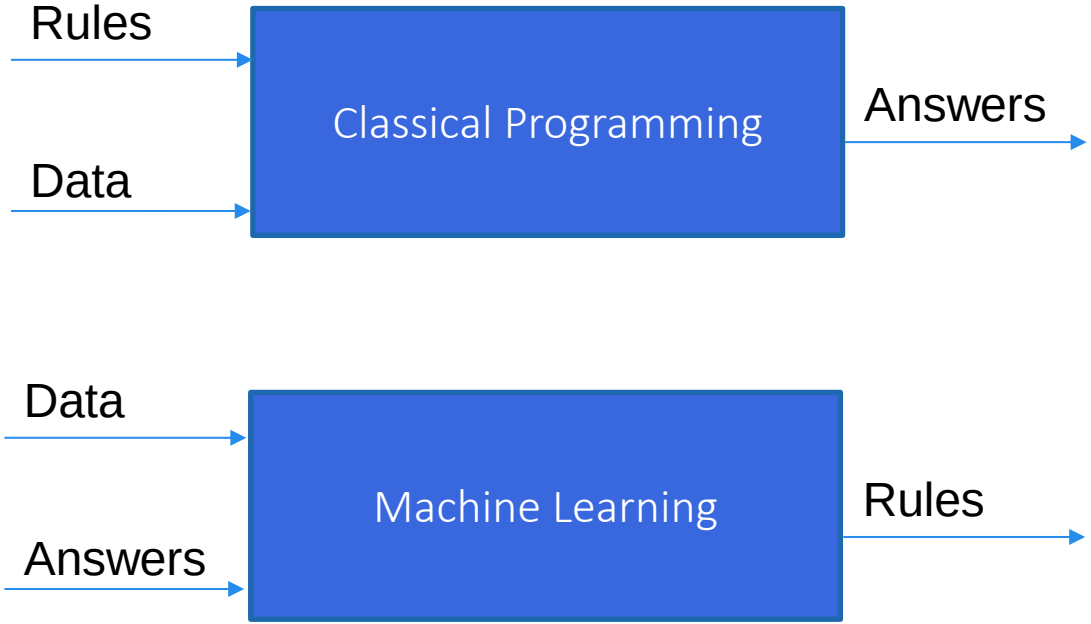
Machine Learning 101

Bert Gollnick

Machine Learning 101

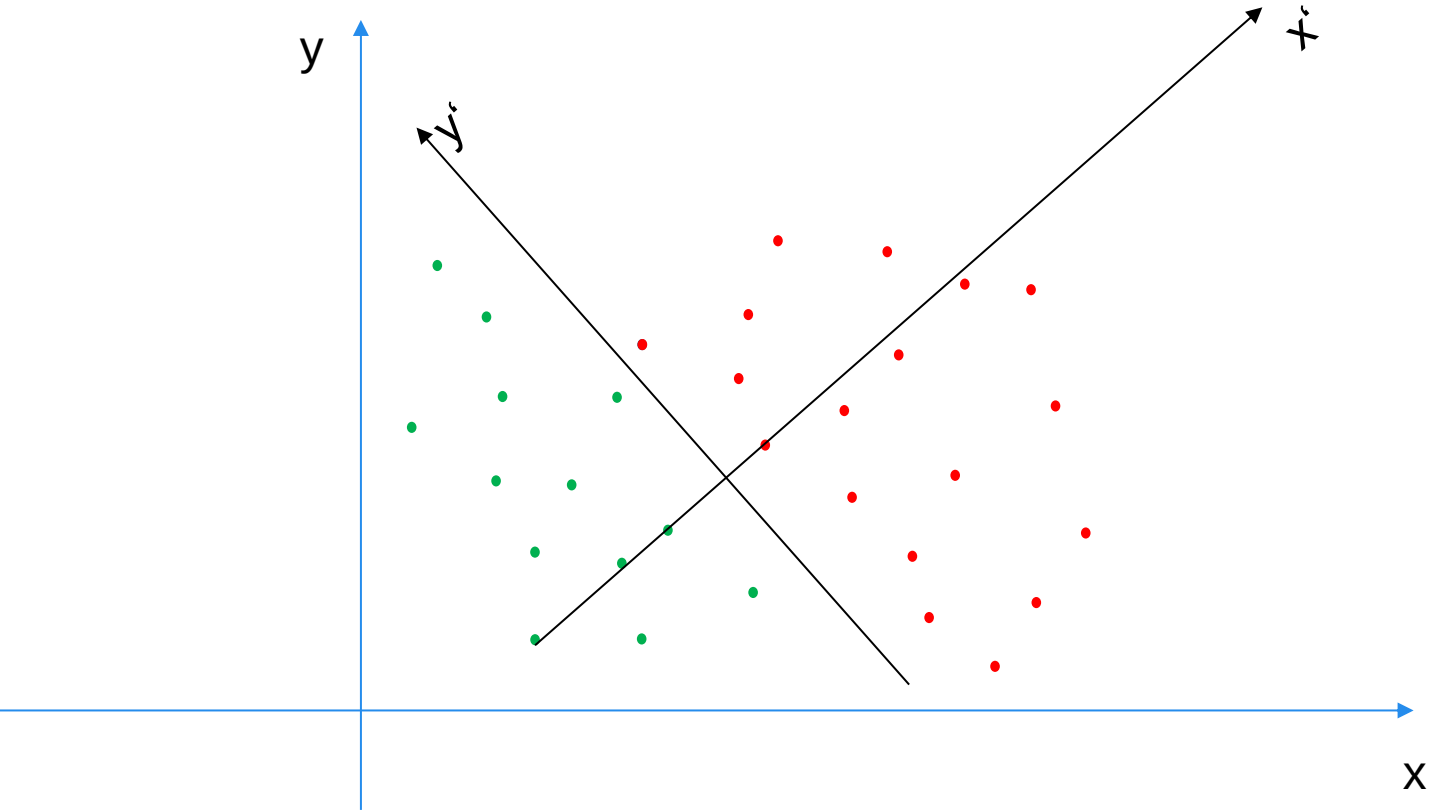
Classical Programming and Machine Learning



Inspired by: Francois Chollet and J.J. Allaire „Deep Learning with R and Keras“

Machine Learning Overview

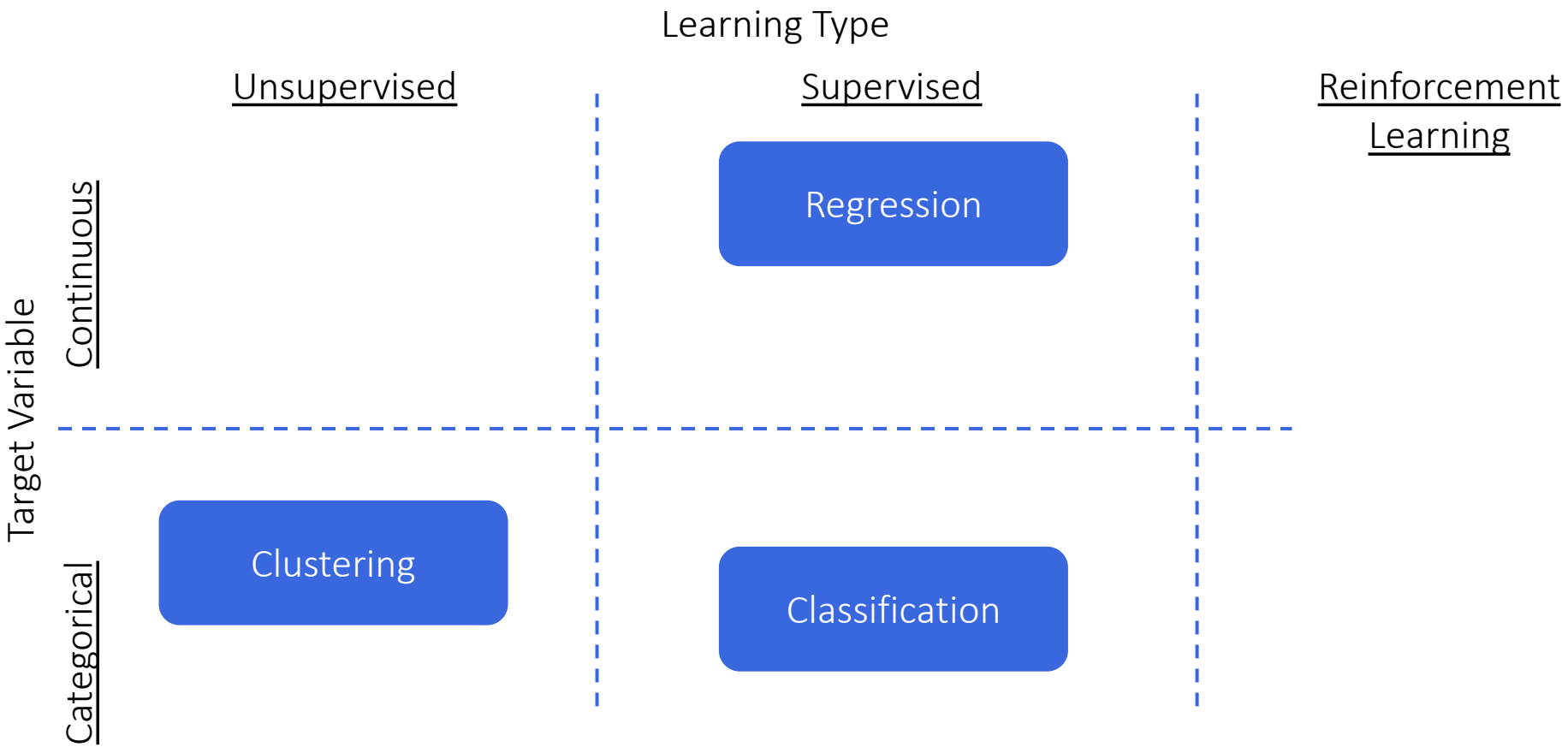
Data Transformation



Classification
Red, if x‘>0
Green, if x‘<=0

Types of Machine Learning

Supervised, Unsupervised, Reinforcement Learning



Types of Machine Learning

Example: School Class

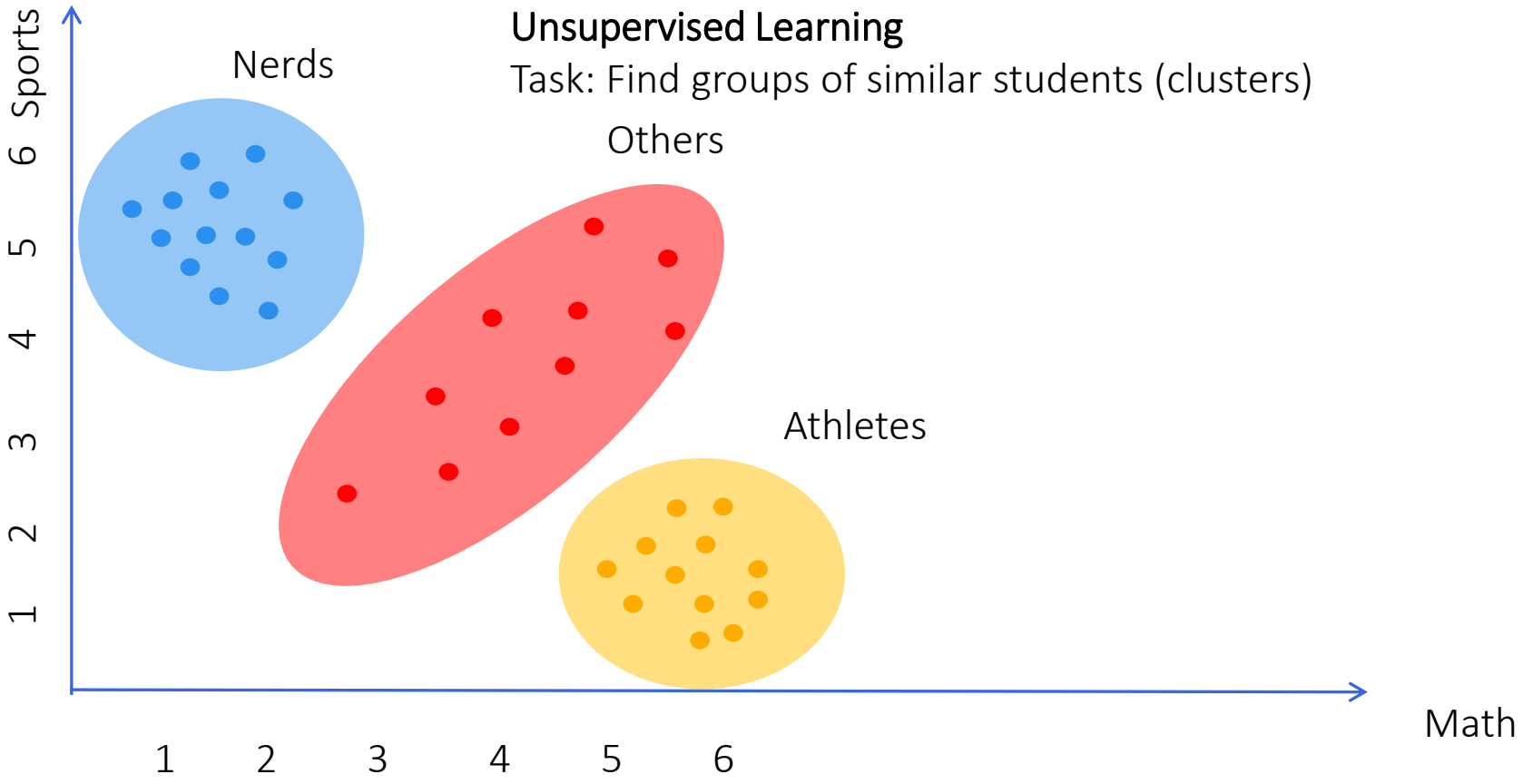
Supervised Learning

Task: Use Label / Target Variable for Learning/Prediction

Name	Age	Learning Method	Class	Grade
Anton	14	A	Sport	2
Bert	15	B	Sport	2
Clare	13	A	Sport	3
Dave	16	B	Math	1
Emilia	15	A	Math	2
…				

Types of Machine Learning

Example: School Class



Types of Machine Learning

Example: School Class

Reinforcement Learning

-Assign Learning Method to each student **one by one**.

-Task: Find which learning method should be chosen in future

-RL Methods find faster solution than A/B tests.

Name	Age	Learning Method	Class	Grade
Anton	14	A	Sport	2
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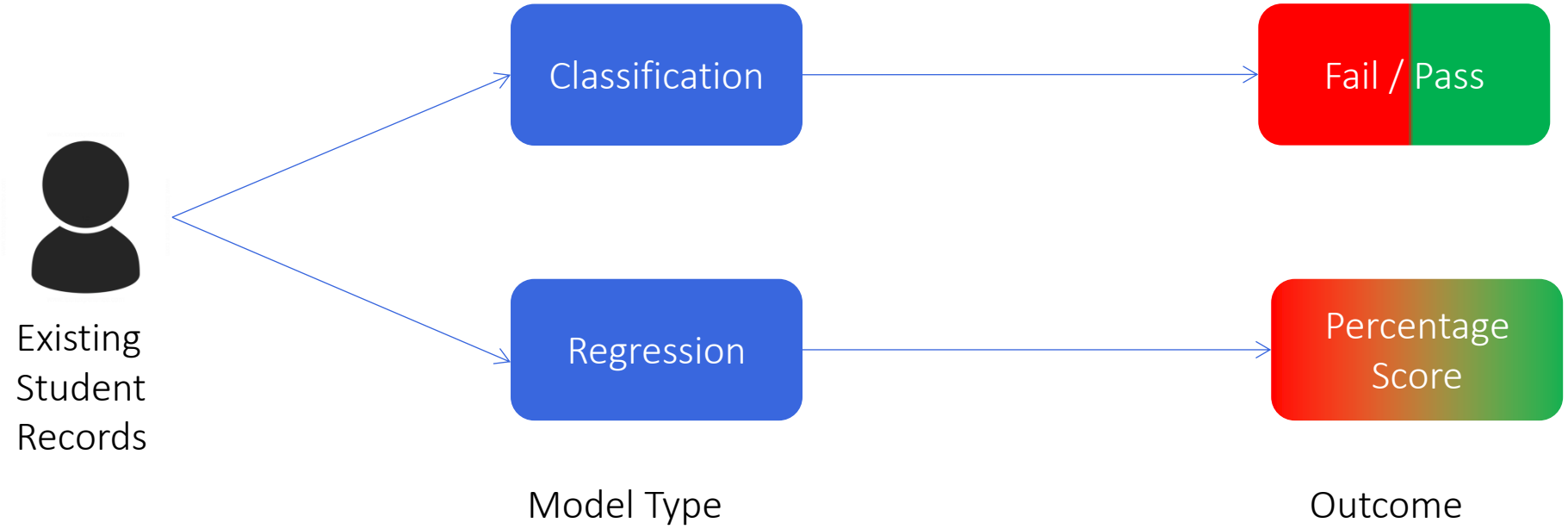
Emilia	15	A	Math	2
…				

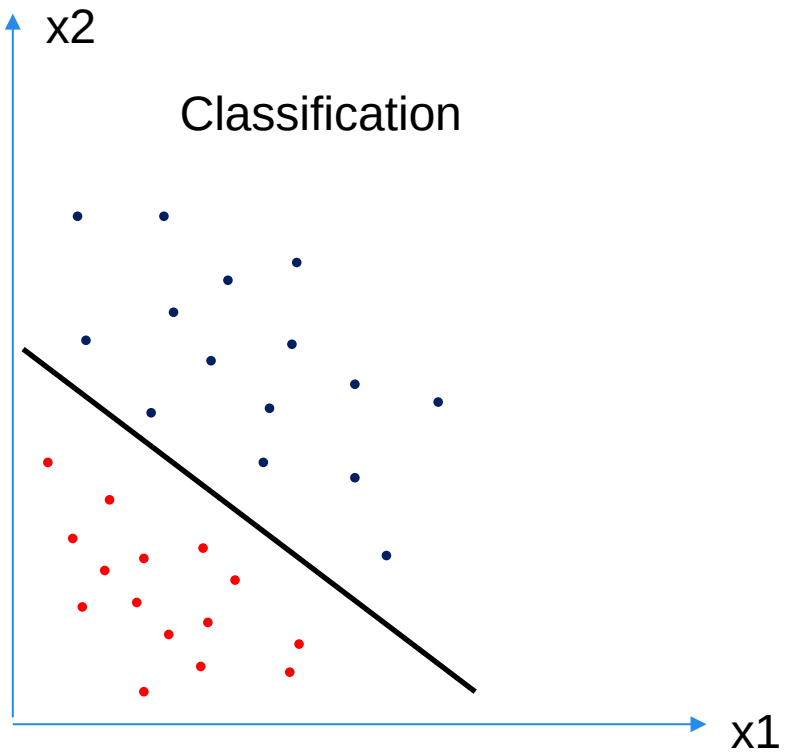
Types of Machine Learning

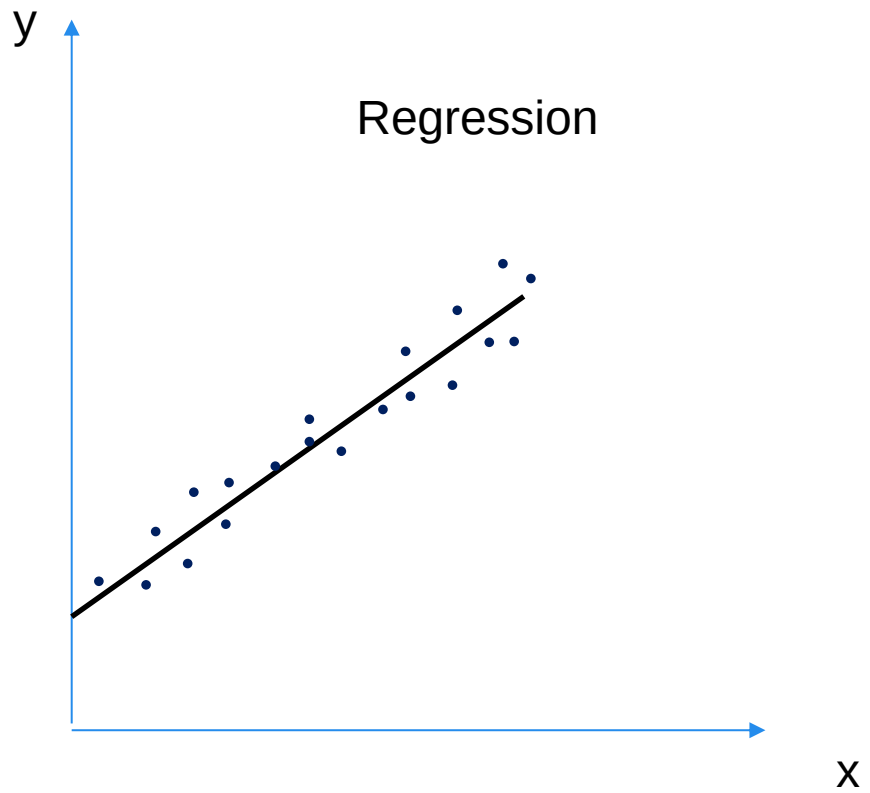
Example: Student Test Prediction



Types of Machine Learning

Example: Classification and Regression Plot





Types of Machine Learning

Example: Student Test Prediction

Property	Classification	Regression
Output / Target Variable	Discrete (class labels)	Continuous numbers
Examples	Fail / pass	Percentage scores
What is searched for?	Decision Boundary, Group membership	Best Fit Line
Evaluation Measure	Accuracy	Sum of squared errors (R^2)