Introduction to Data Science - Python

ENSISA CPB2

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Introduction

What is Data Science ?

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- Extracting information from a given dataset.

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Data Science can also be used in: Business Intelligence, Data Analytics, Visualization etc.

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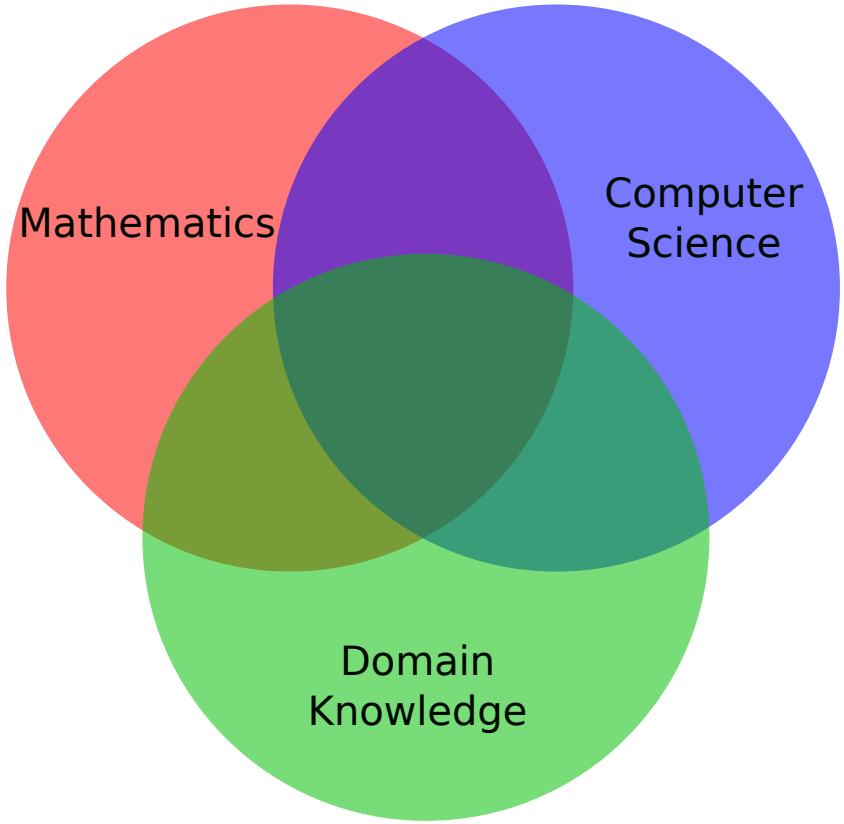

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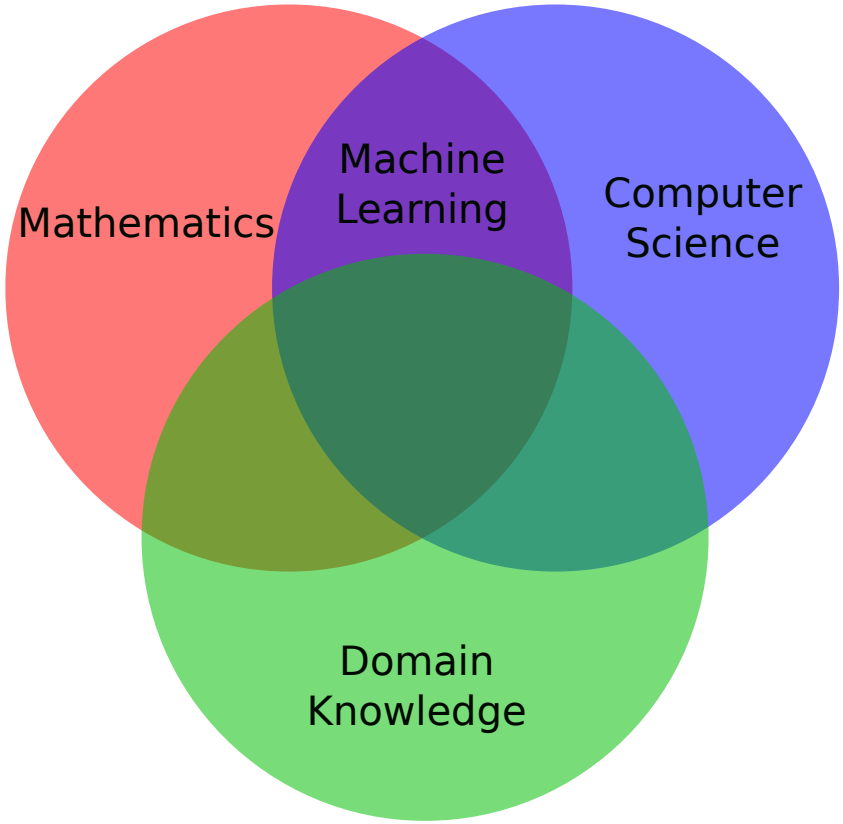

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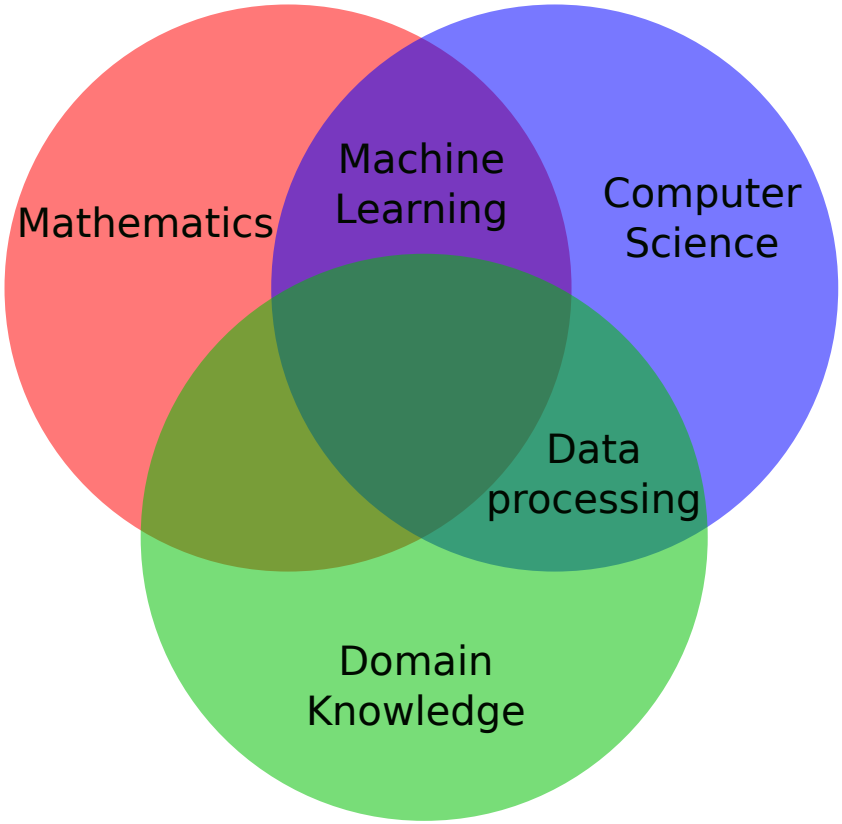

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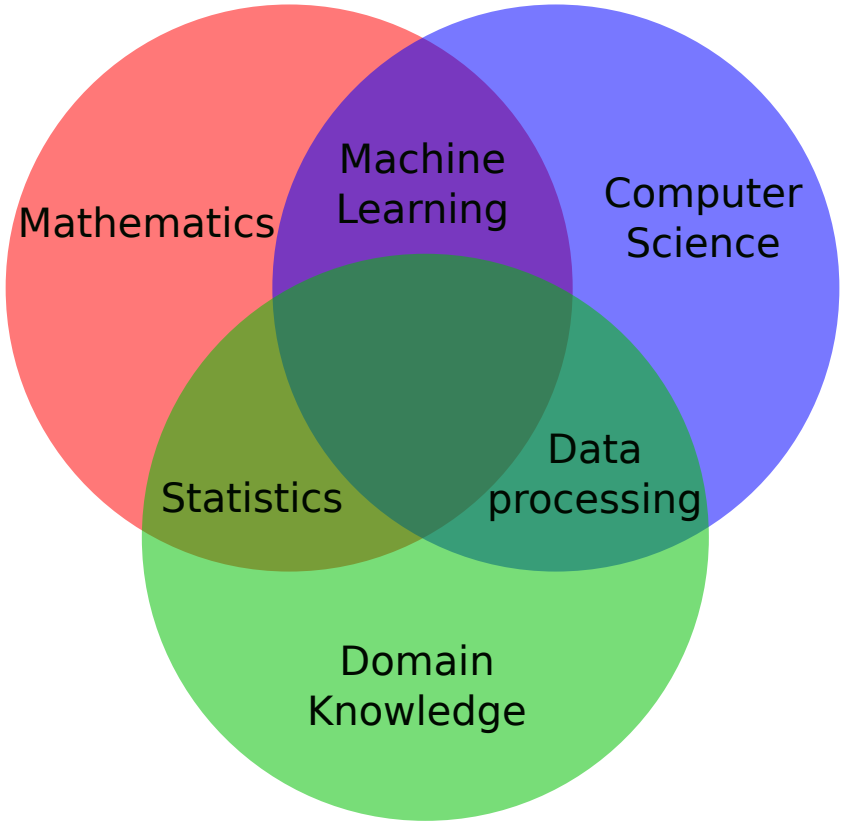

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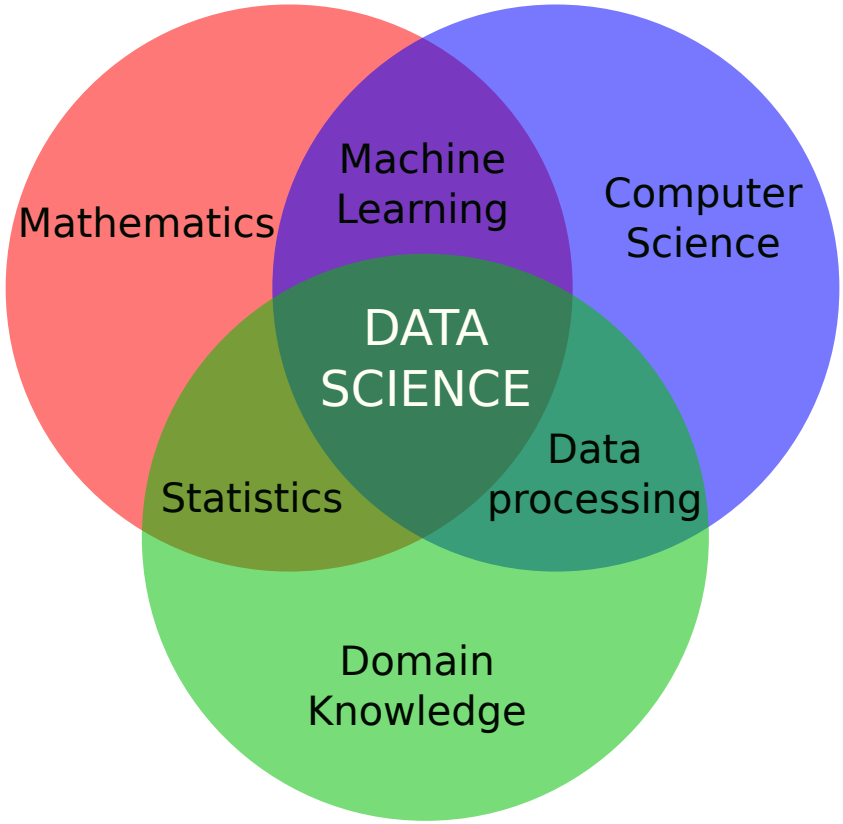

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- Its a collection of algorithms used in order to analyse, understand, process some data
- Its a rapidly evolving science

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We need more data

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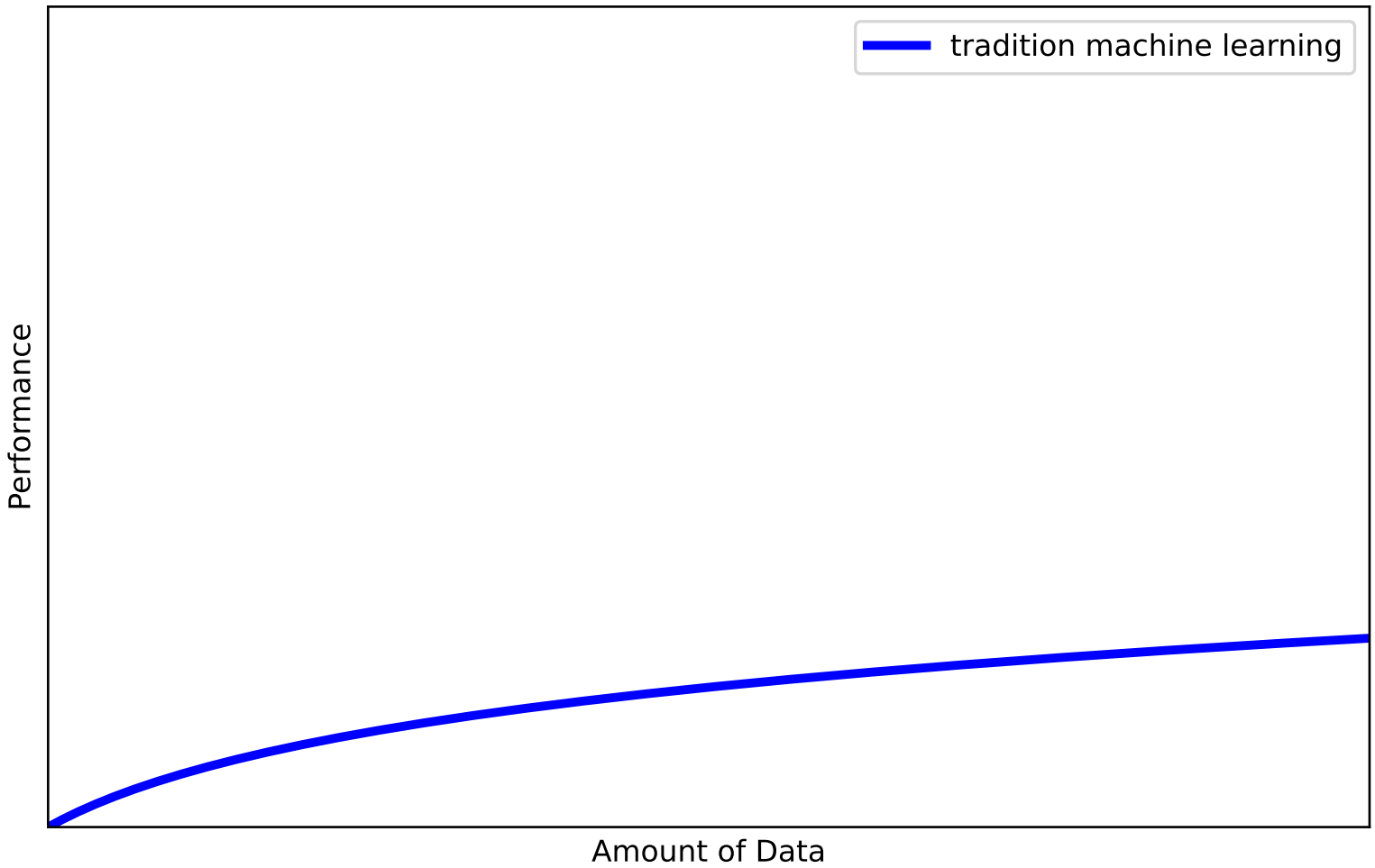

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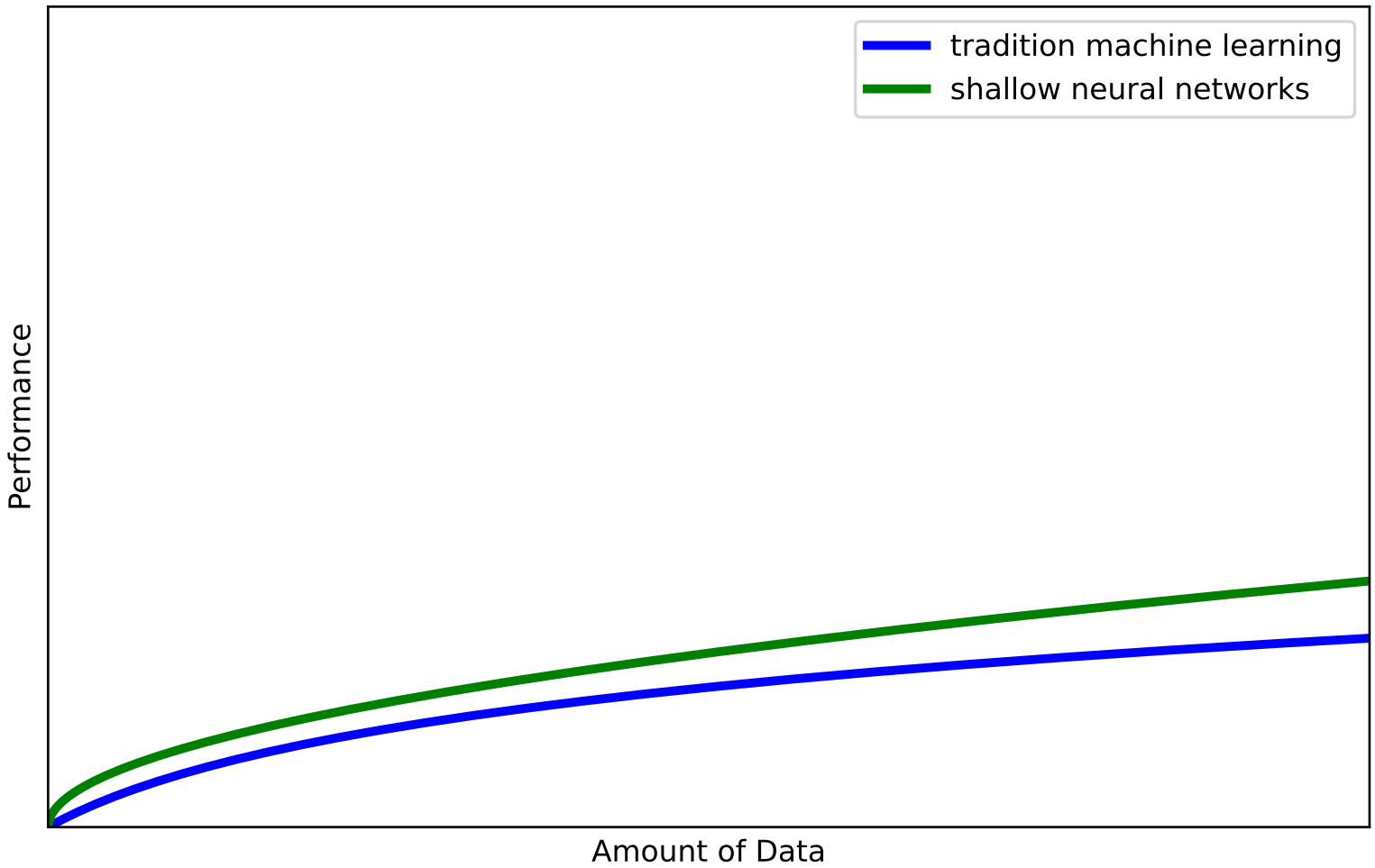

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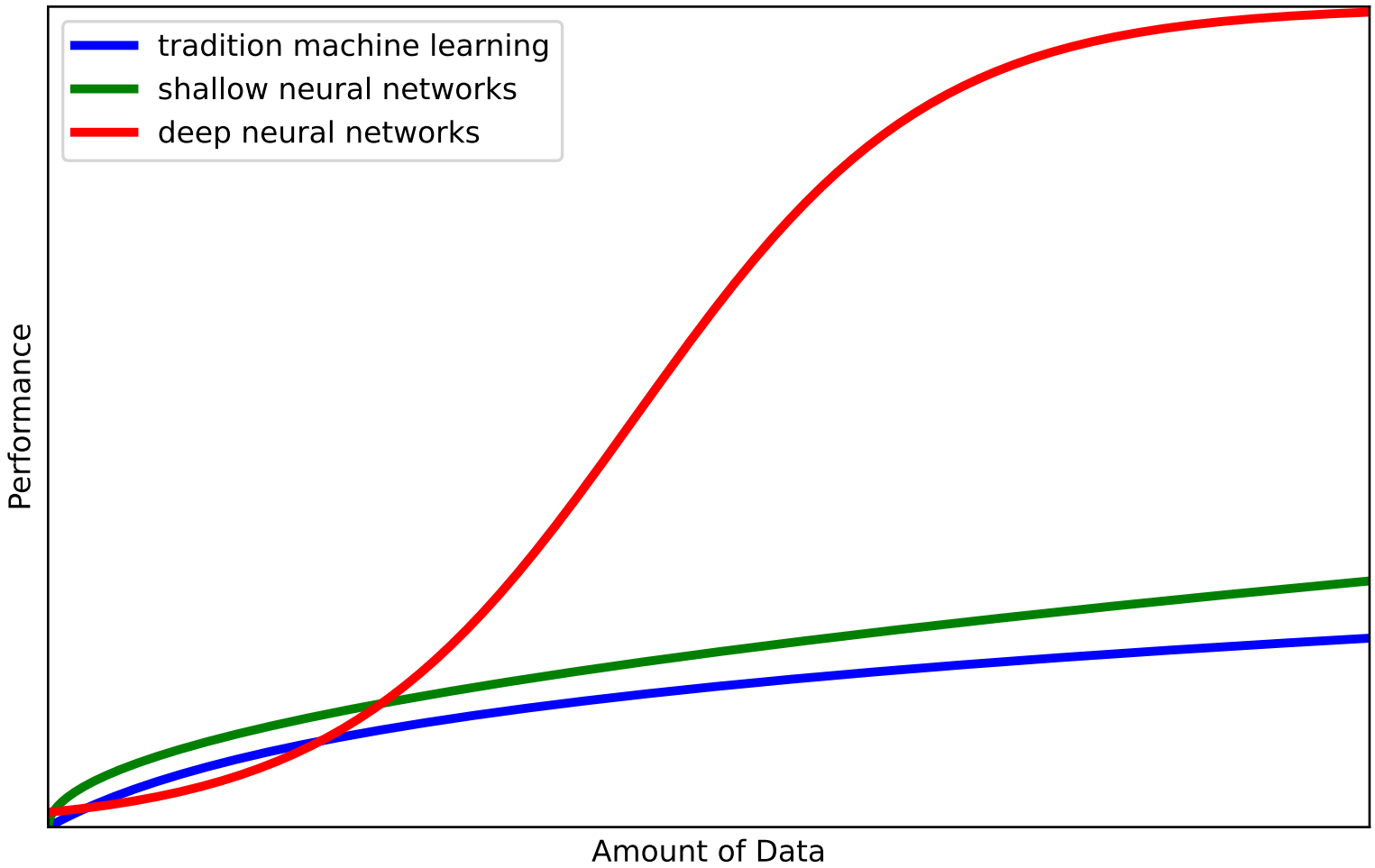

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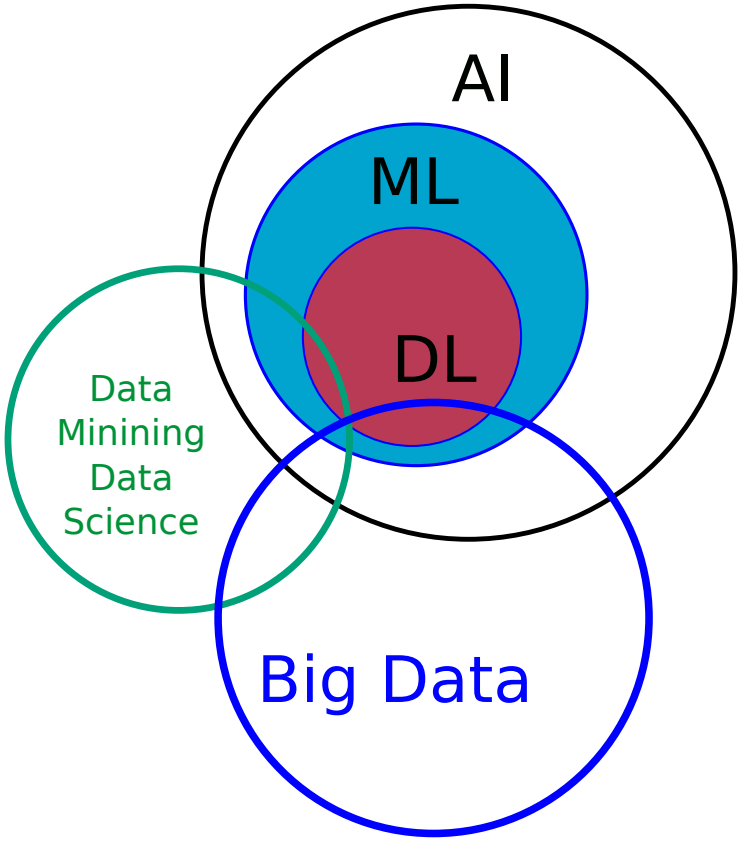
  - Raises a question for the usage of existing learning methods
  - The more we have data the better models we can learn

Categories of Data Science



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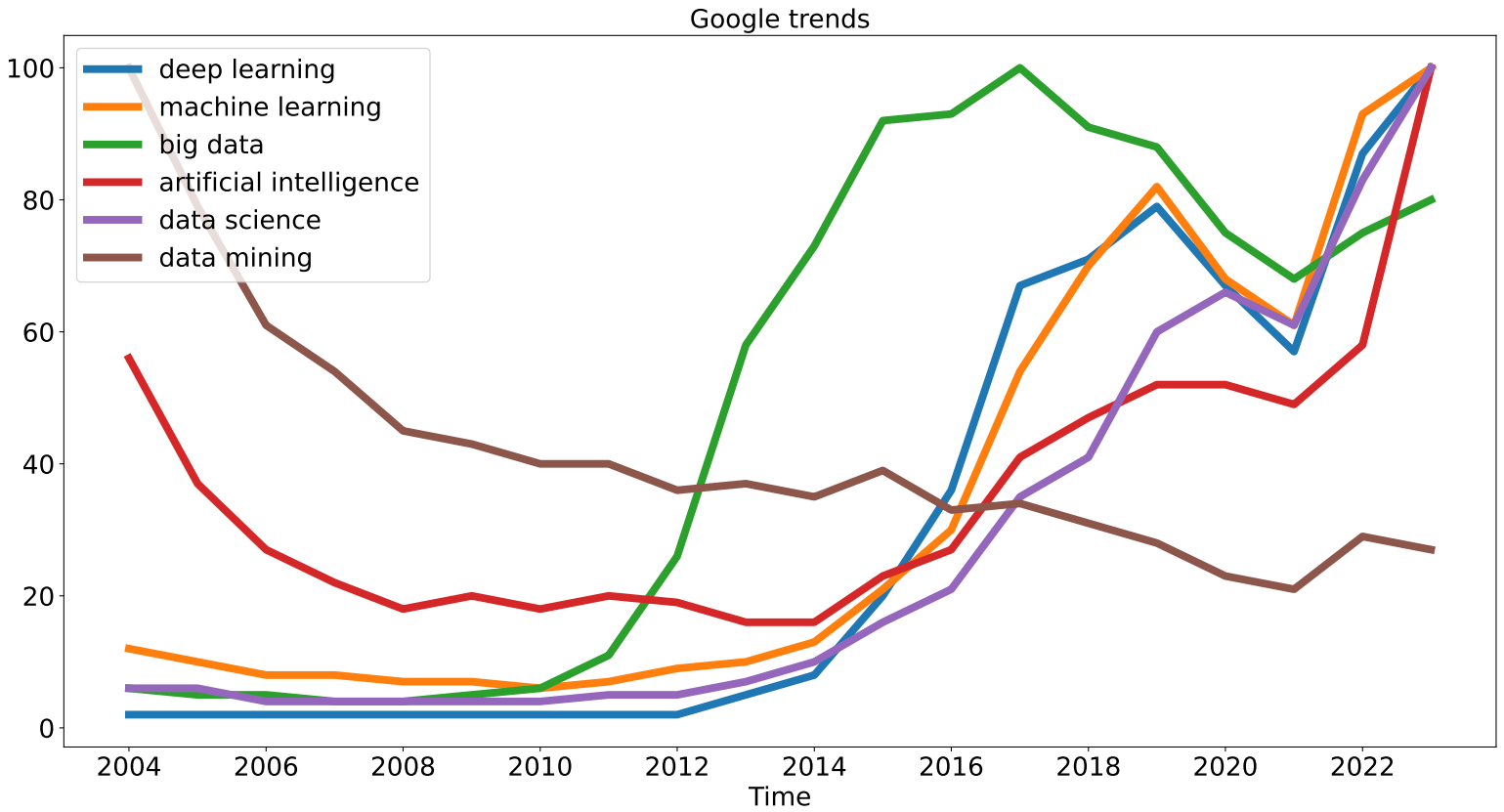

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- **Be careful of fake news**
  - How Big Data will help feeding 9 billion person
  - AI can now foresee cancer years before it develops
  - Checkout how AI models can generate a Breaking Bad episode
  - Become a billionaire with Big Data ?

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Types of Data:

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Types of Data: Structured vs Unstructured Data

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Example of structured data:

	Attribute 1	**Attribute 2**	**Attribute 3**
Instance 1	1.1	dog	True
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- Can be found in databses, clouds etc.

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Dataset Example: IRIS

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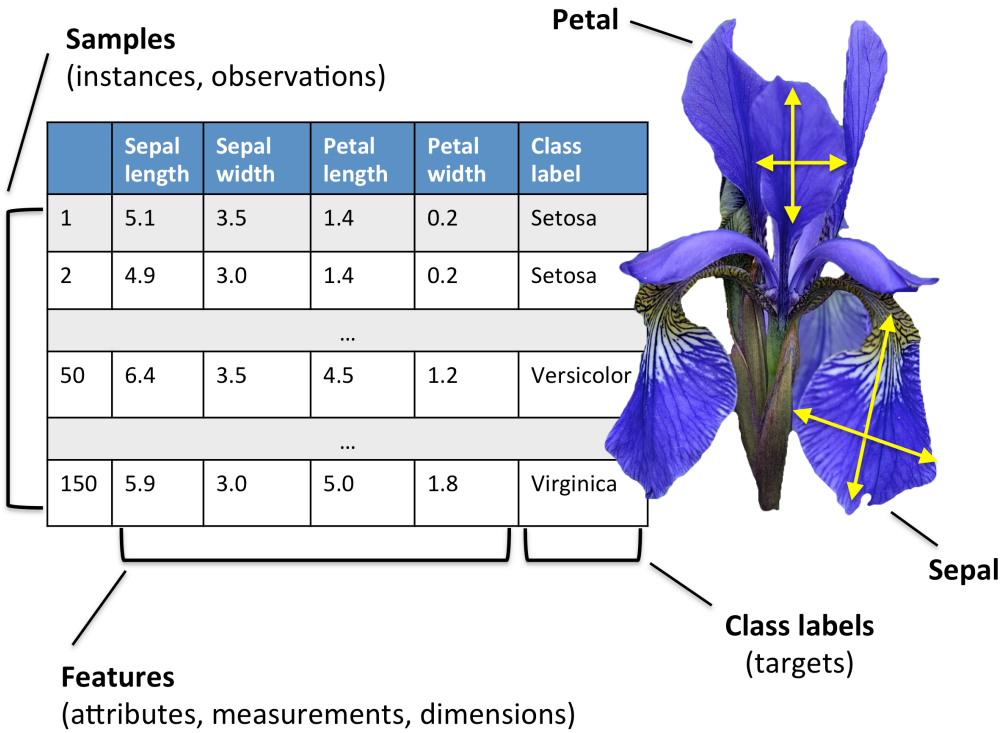

	Sepal length	Sepal width	Petal length	Petal width	Class label
1	5.1	3.5	1.4	0.2	Setosa
2	4.9	3.0	1.4	0.2	Setosa
...					
50	6.4	3.5	4.5	1.2	Versicolor
...					
150	5.9	3.0	5.0	1.8	Virginica

source: https://rpubs.com/wjholst/322258

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Some IRIS samples:

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sepal length	sepal width	petal length	petal width	iris type
5.1	3.5	1.4	0.2	setosa
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7	3.2	4.7	1.4	versicolor
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7.3	2.9	6.3	1.8	virginica
7.7	2.6	6.9	2.3	?

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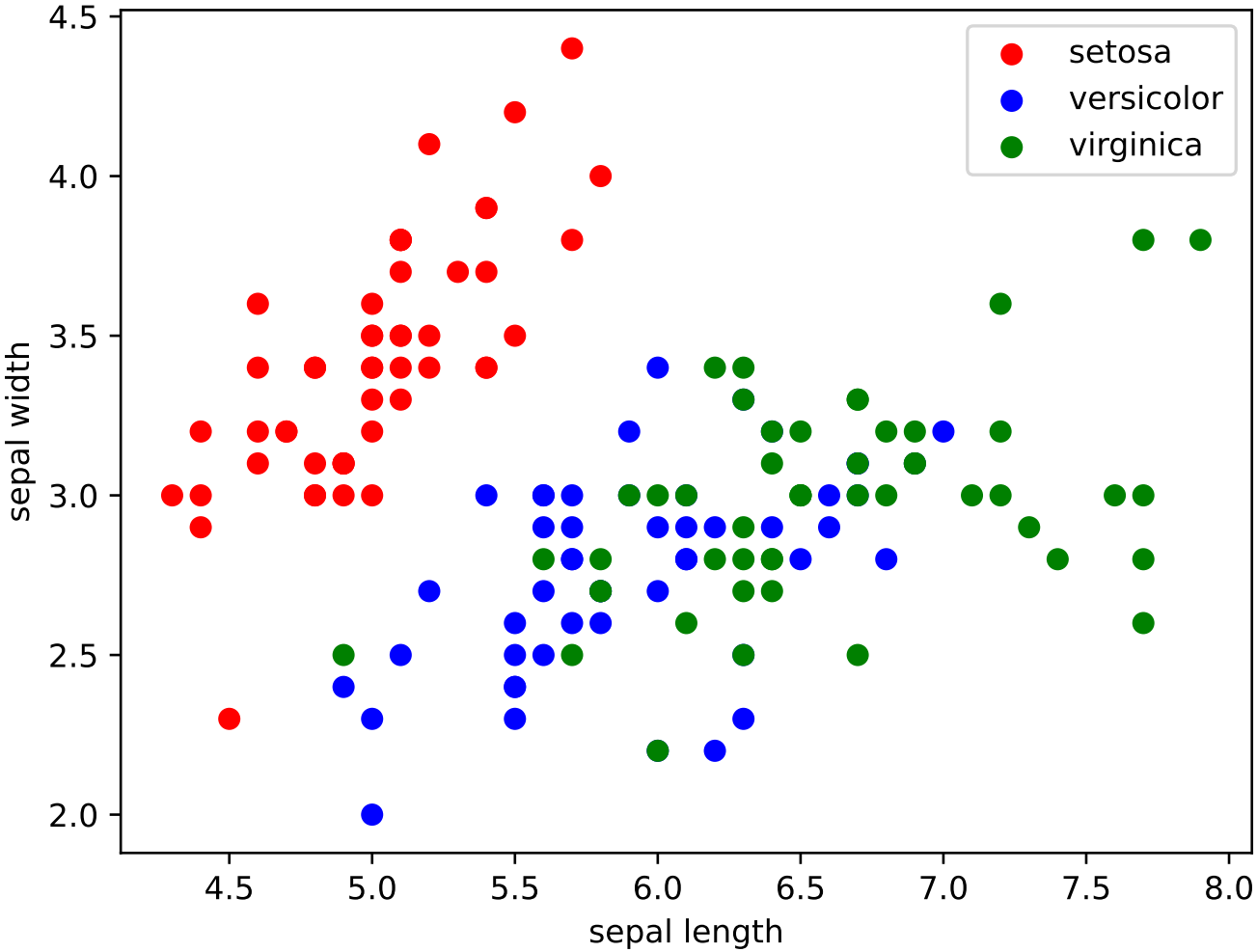

Data Example 2: Pokemon Types

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Height in meters

Weight in Kg

Which type the Pokemon belongs to i.e. Water, Fire etc.

Pokemon Example

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Pokemon Name	Height	Weight	Type
Bulbasaur	0.7	6.9	Grass
Charmander	0.6	8.5	Fire
Squirtle	0.5	9.0	Water
Caterpie	0.3	2.9	Bug

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Charizard	1.7	90.5	?

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Visualization of types: Ground, Psychic and Poison.

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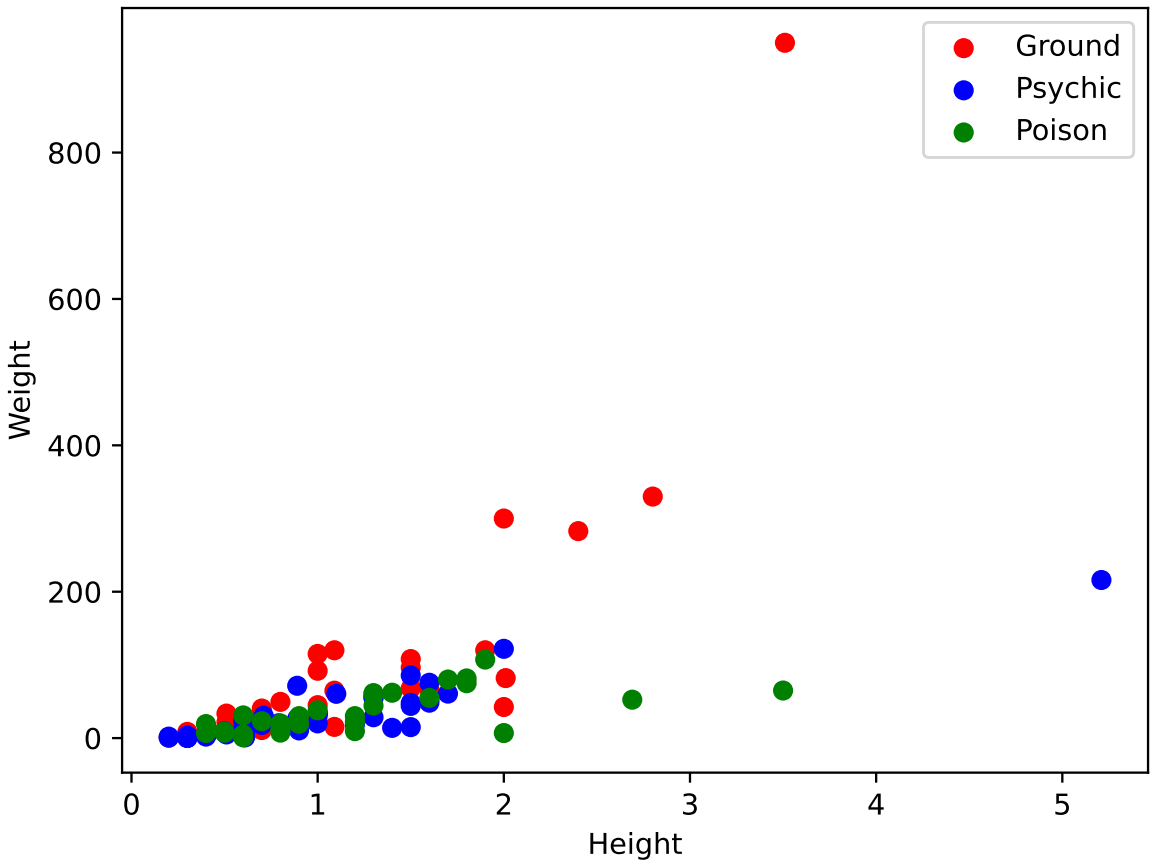

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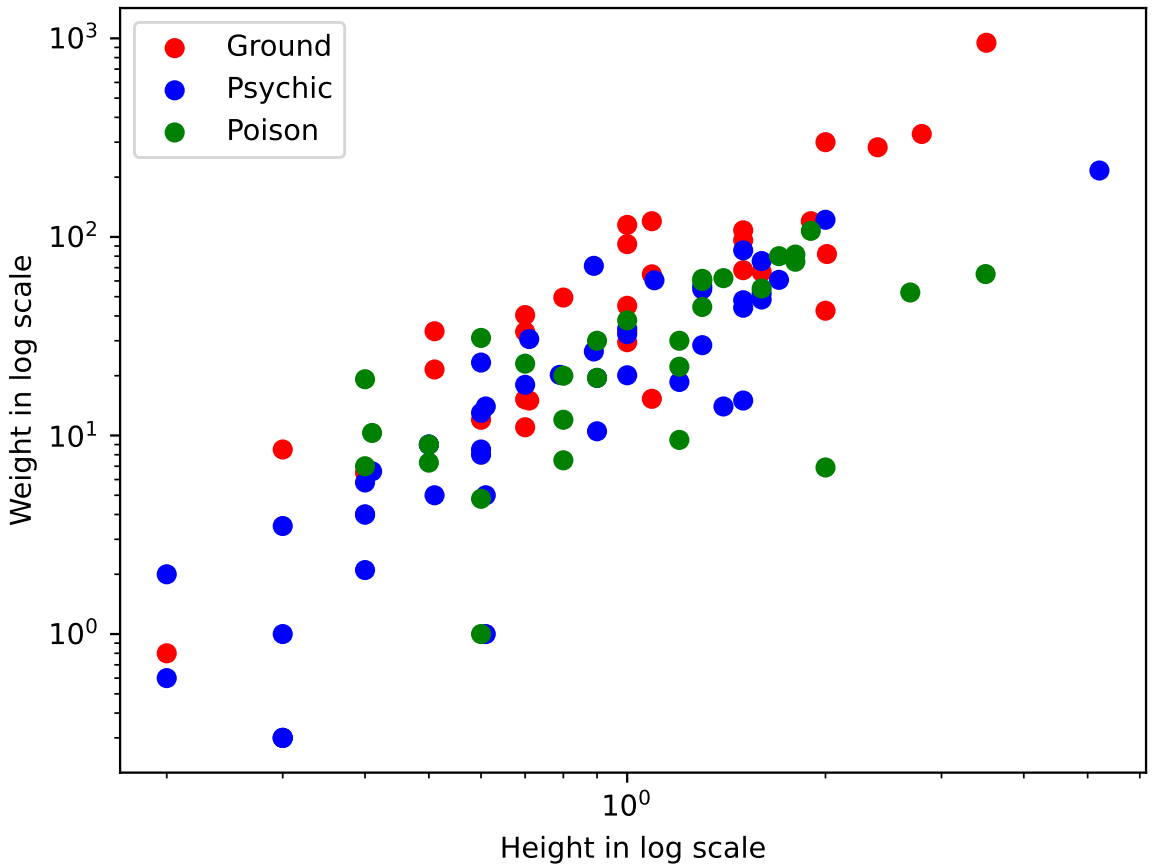

Different tasks to solve in Data Mining

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- Classification: predict the discrete value of the class label

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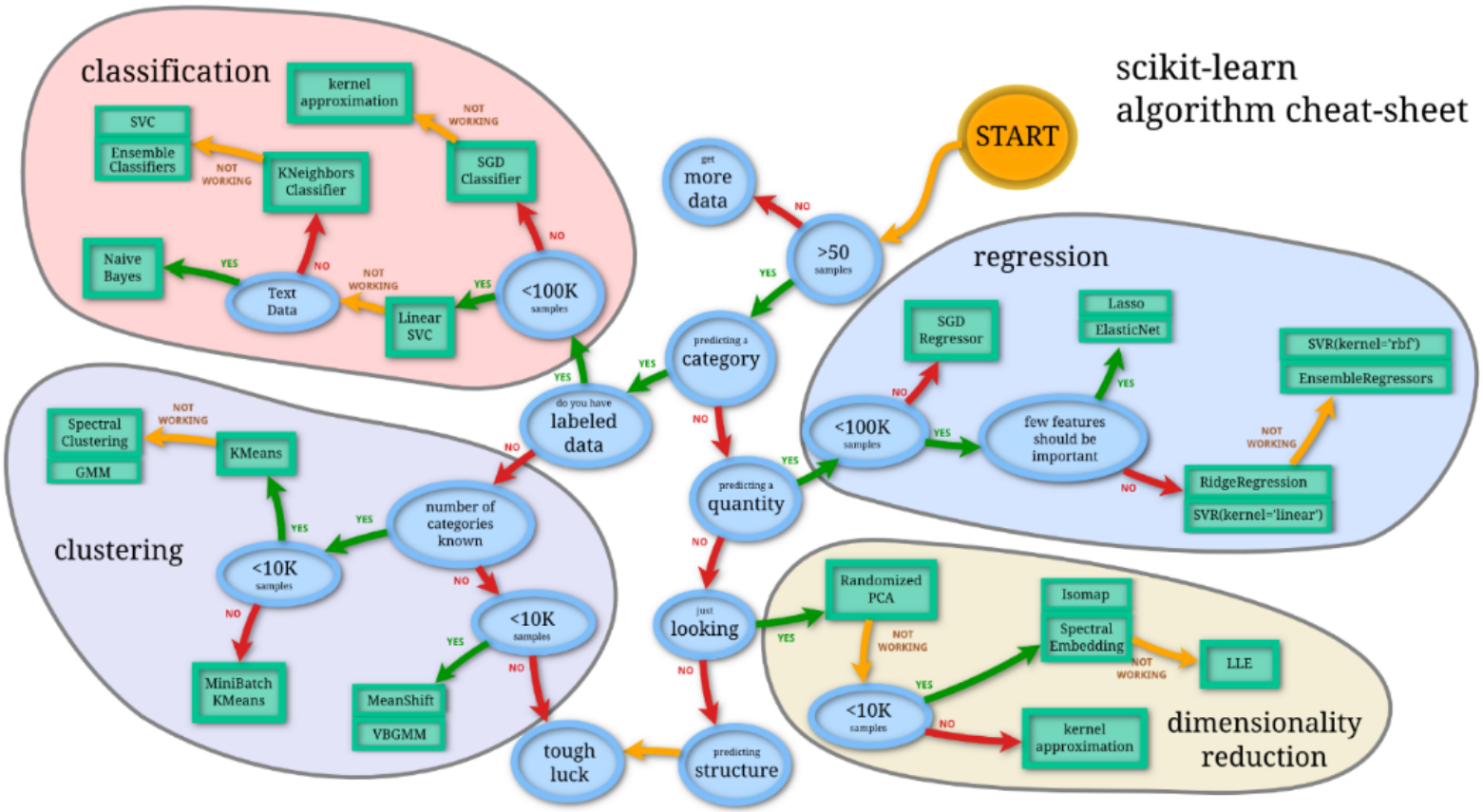
source: https://scikit-learn.org/



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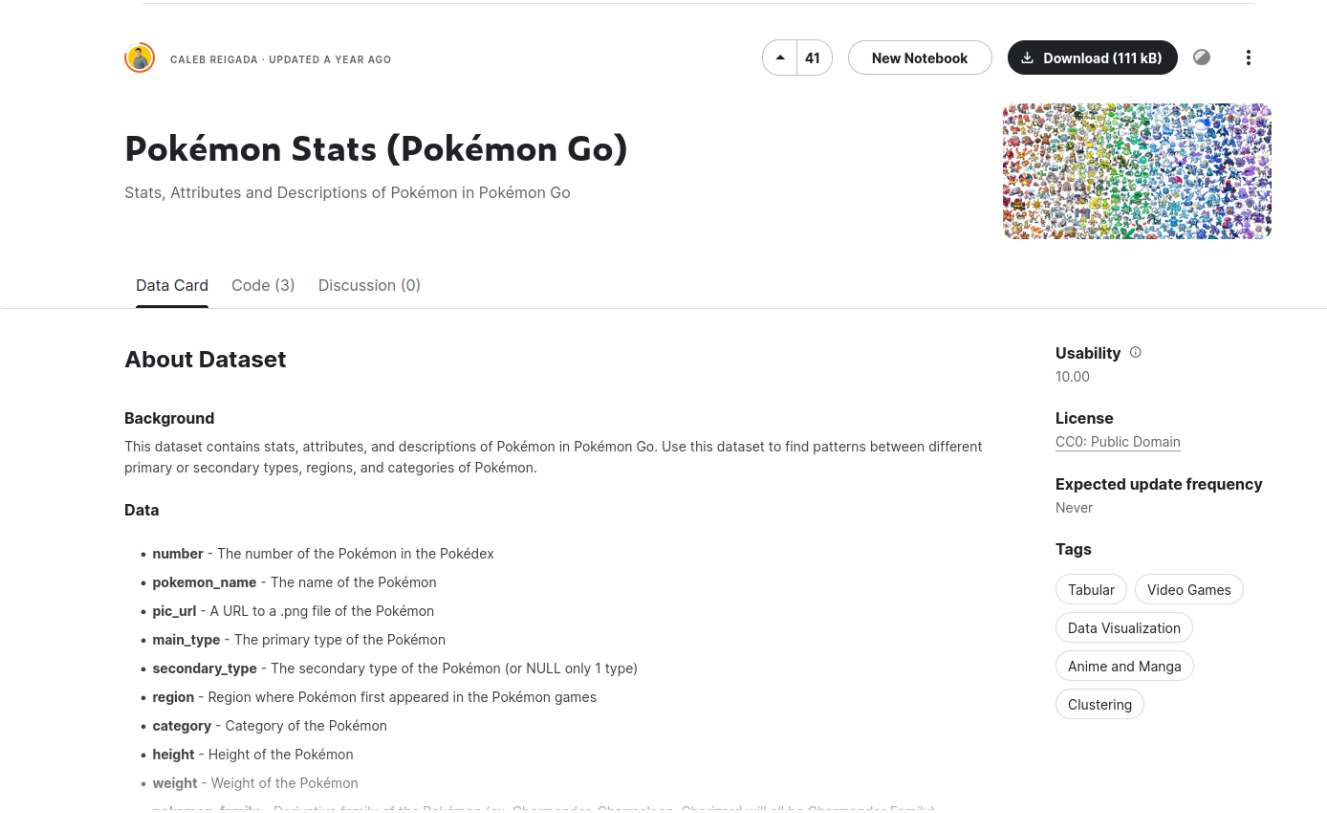

source: https://www.kaggle.com/datasets/calebreigada/pokemon