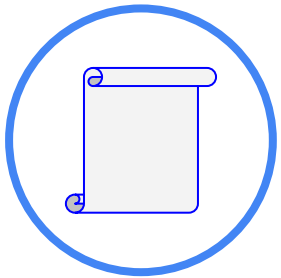
Machine Learning

Us (for the last time)

Today's Focus



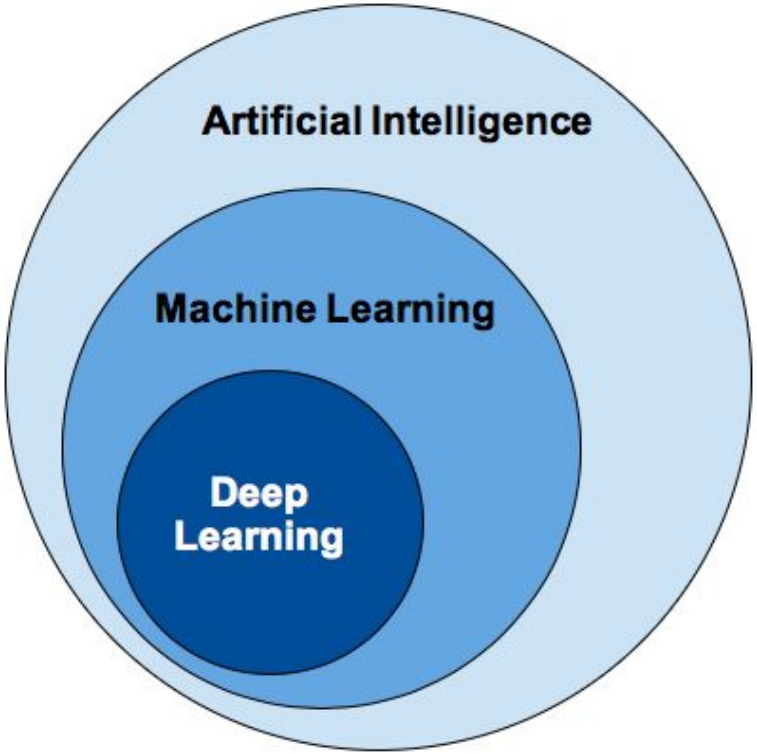
ML Theory

Scikit-Learn

Challenges

What is Machine Learning?

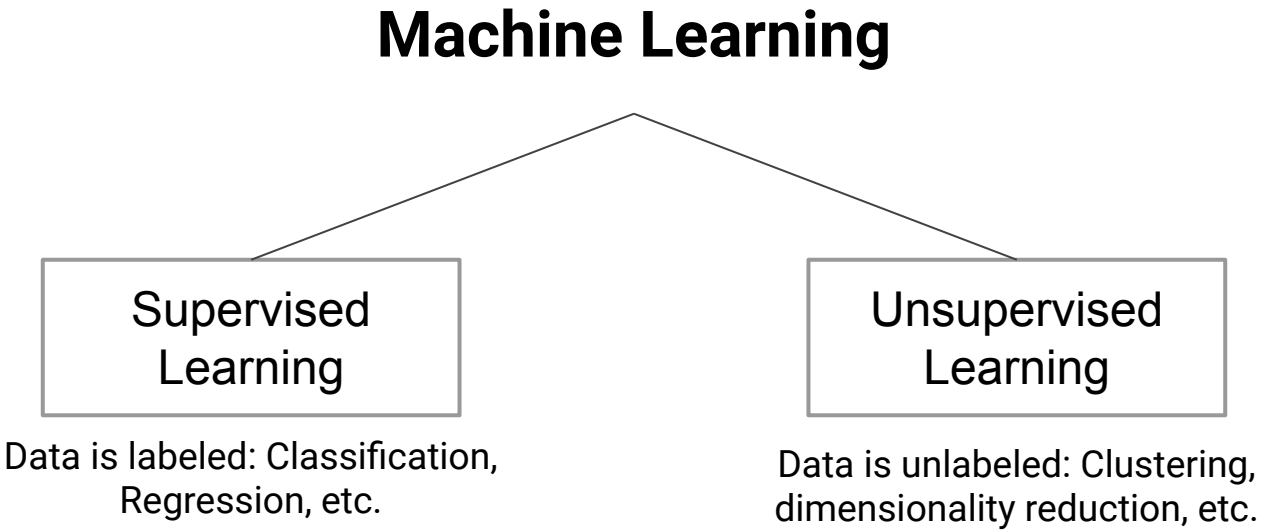
Difference between AI / Machine Learning / Deep Learning



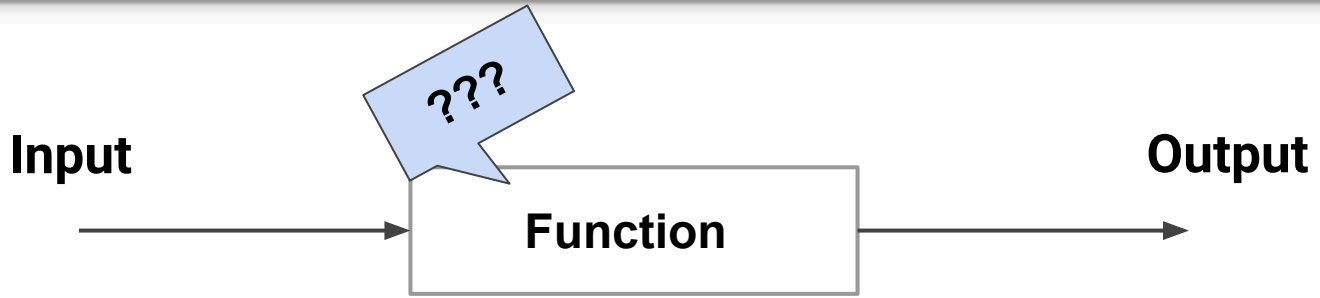
What is Machine Learning?

- In short, algorithms that can be trained with labelled data. Always with the aim that the algorithms are able to **generalize** in a later stage
  - Make accurate predictions for new objects that were not seen during training
- Machine Learning covers fields of statistics, computer science, psychology and more

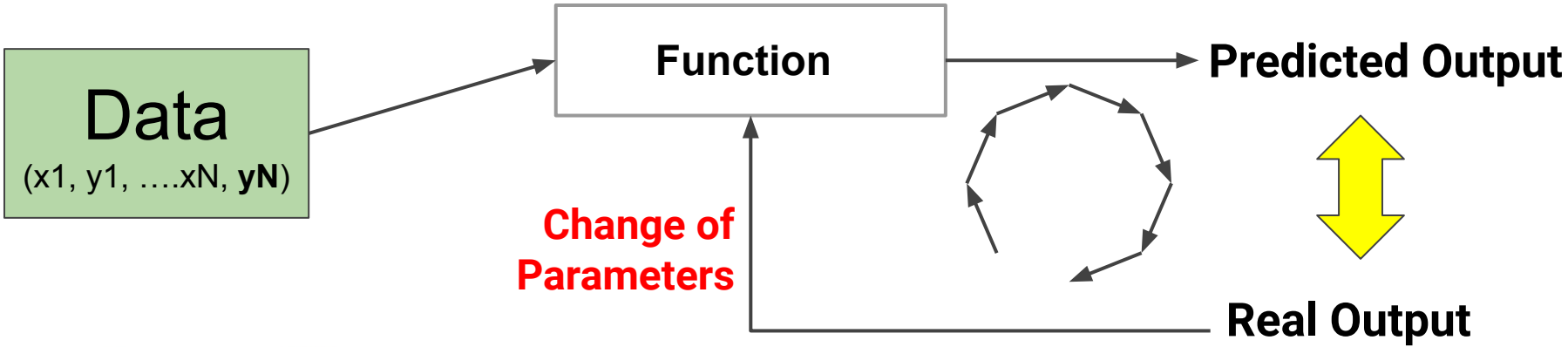
Supervised vs. Unsupervised Learning



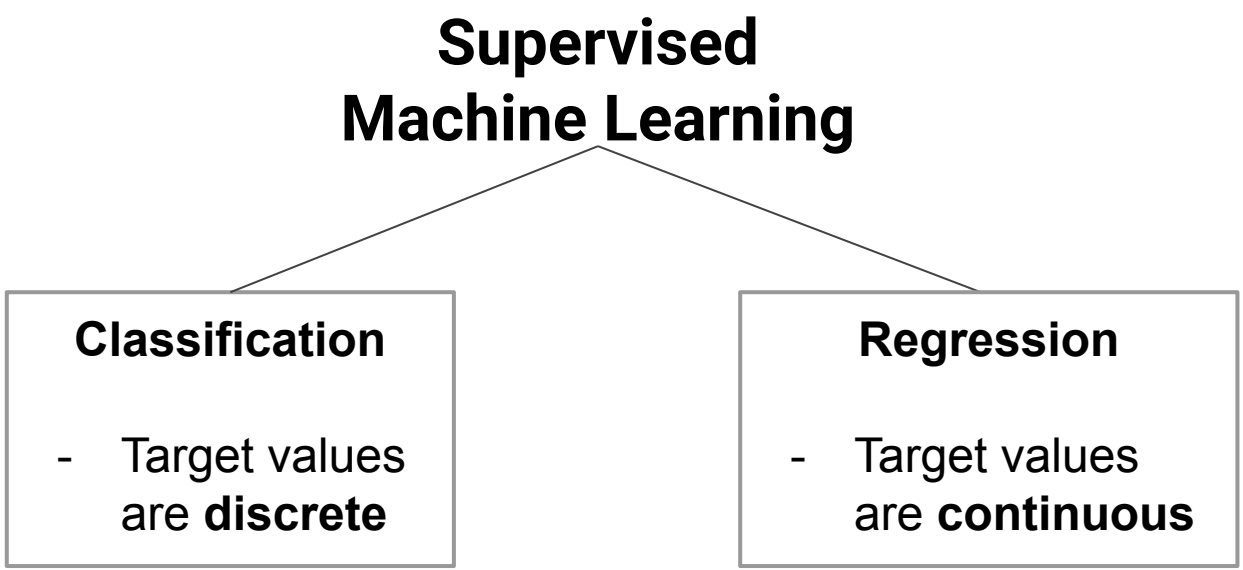
Supervised Machine Learning I



→ WE DO NOT KNOW HOW OUR FUNCTION LOOKS LIKE...



Supervised Machine Learning II

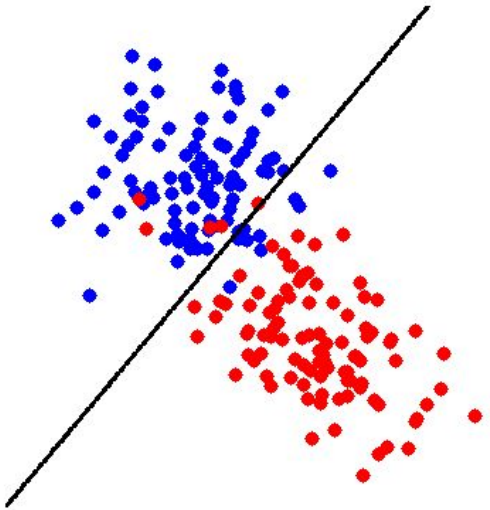


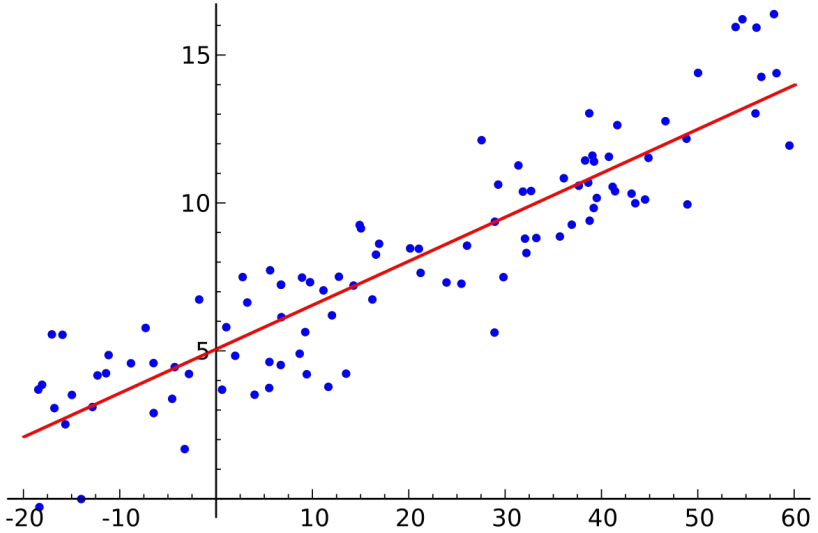
Supervised Machine Learning III

Classification

Supervised Machine Learning

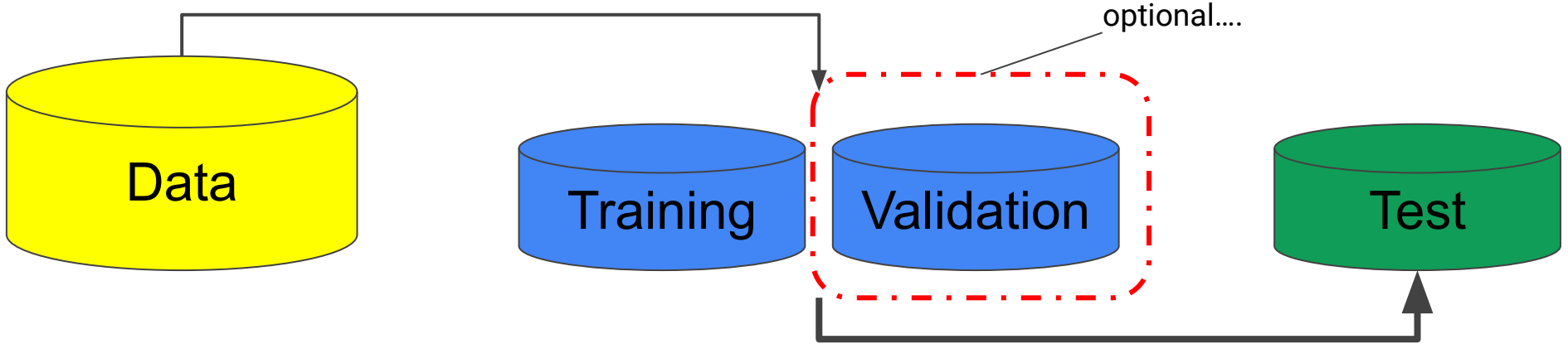
Regression





Training vs. Testing

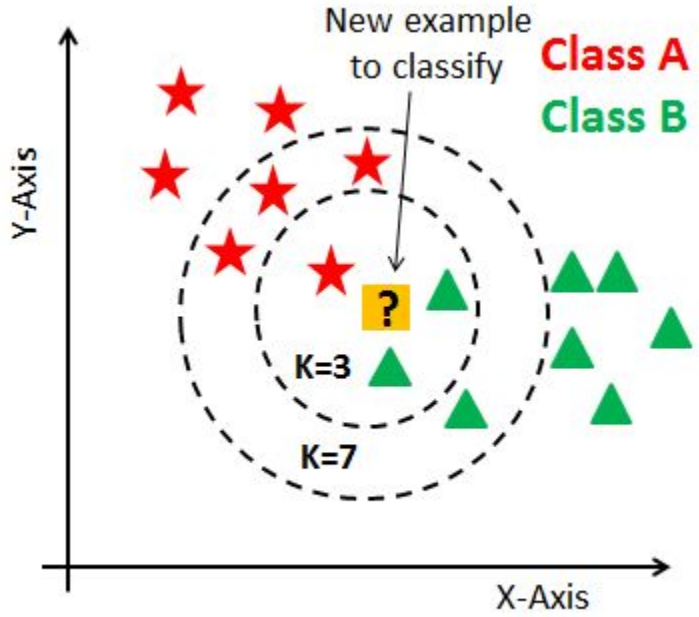
GOAL: Our ML is able to **generalize** on completely new data points!



Our first ML model...

K-Nearest Neighbour I

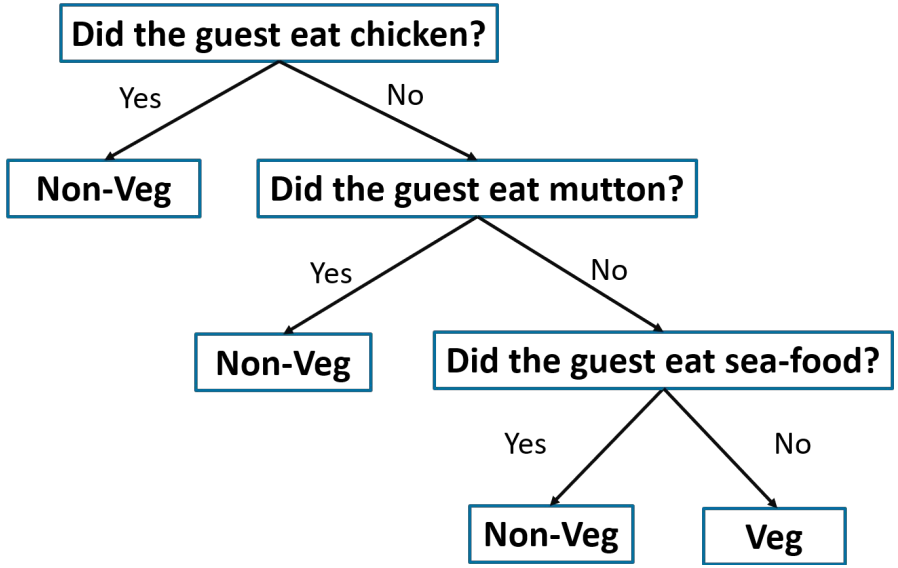
- KNN can be used for classification, but also for regression
- K: number of the nearest neighbours the classifier will take into account in order to make its prediction (hyper-parameter)
- Clear distance metric: *Euclidean norm*



Our second ML model!

Decision Tree I

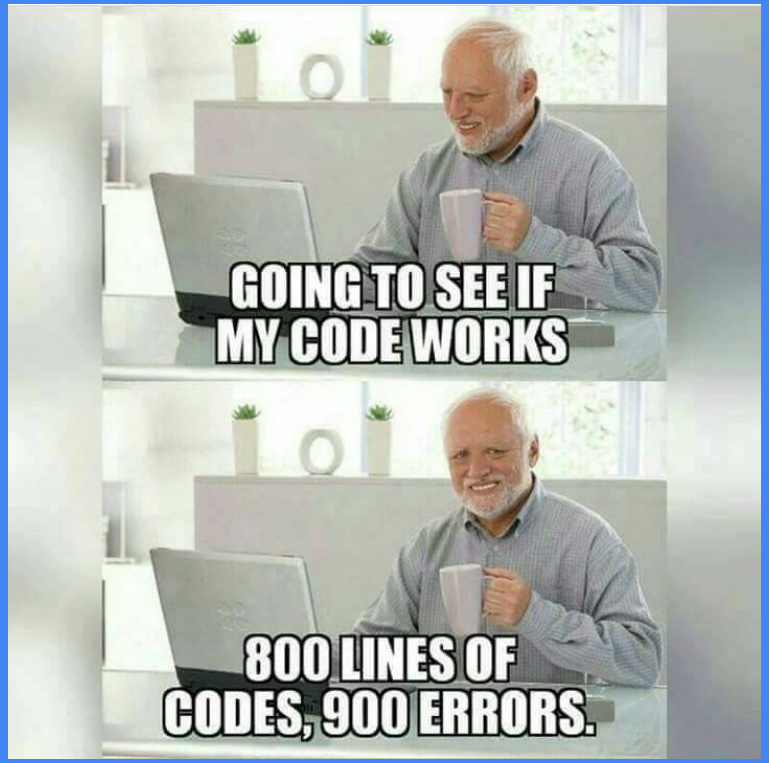
- DT can be used for classification, but also for regression
- The aim of DT is to find a sequence of questions in order to have the best accuracy of classifying the data with fewest steps
- **Easy to interpret!**



Ok, enough theory! 

→ Time for ...

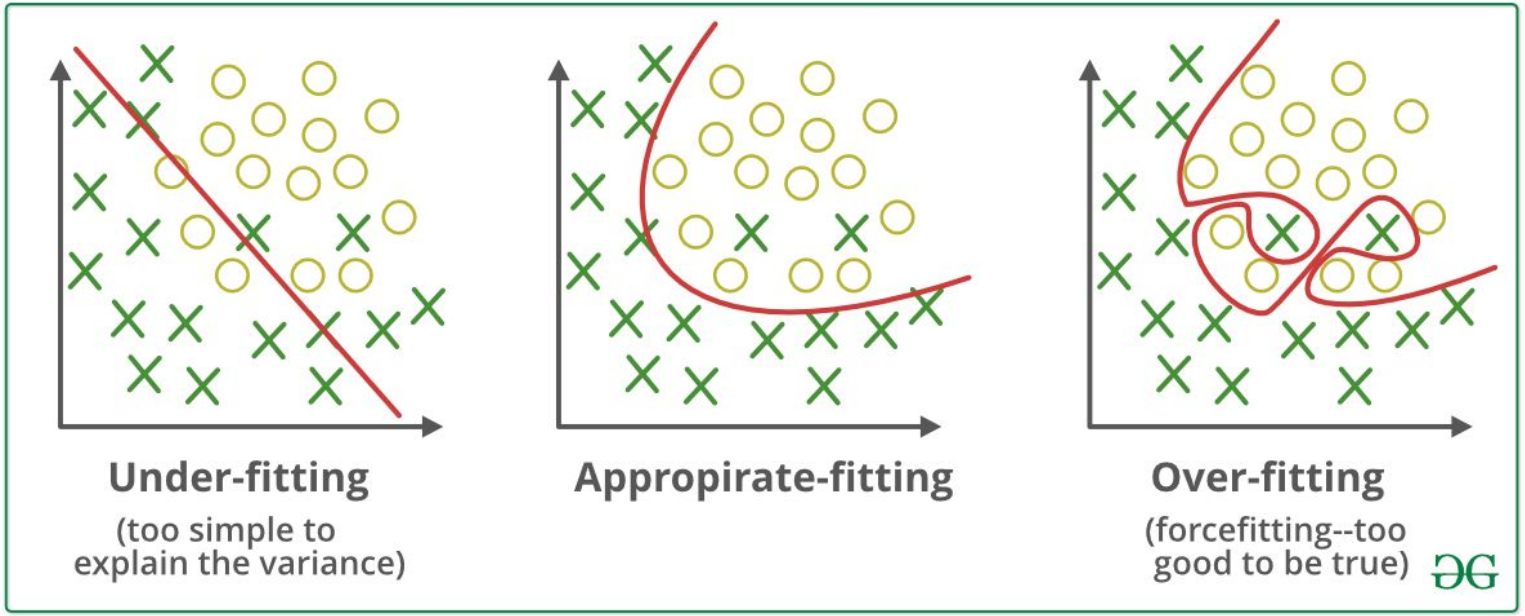
CODING!



… one last thing ☝

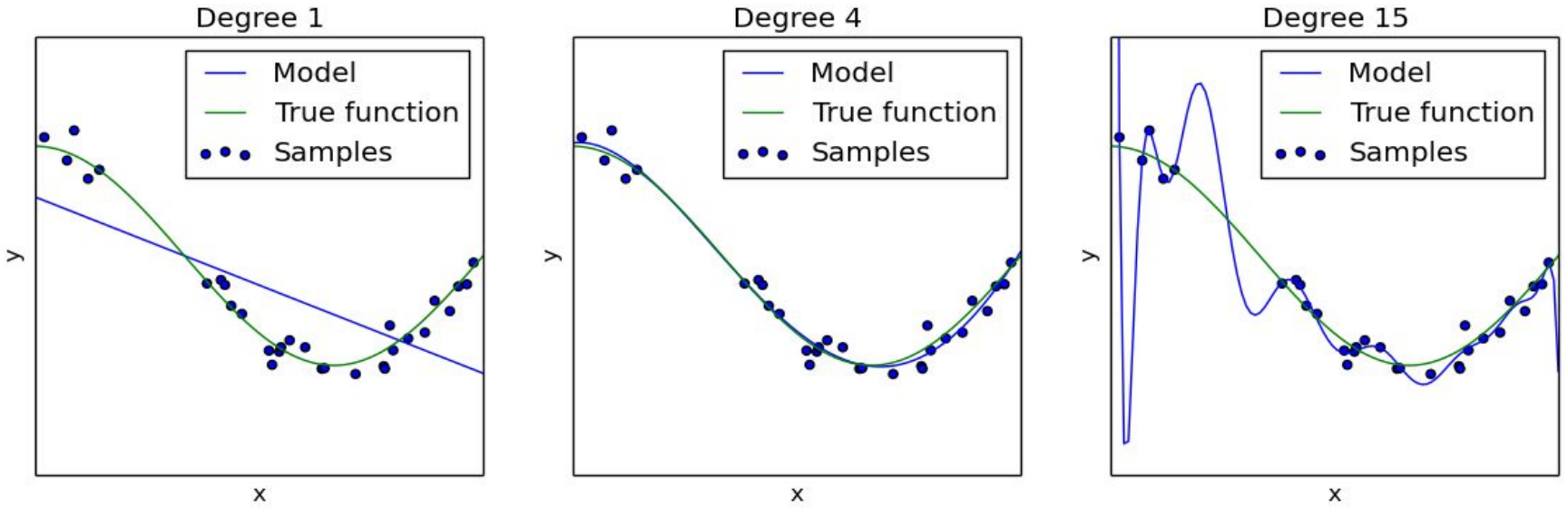
Overfitting vs. Underfitting I

Classification



Overfitting vs. Underfitting II

Regression



Great job!

You did it!💞👏

Thanks!

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