

# **Introduction to Machine Learning**

## **Introduction: Models & Learners**

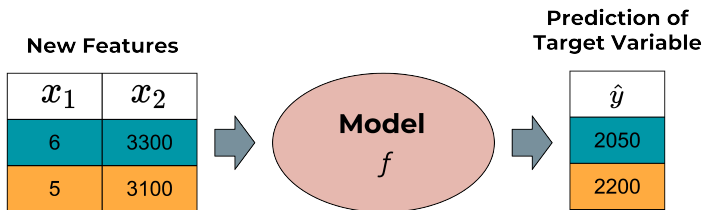
[compstat-lmu.github.io/lecture\\_i2ml](https://compstat-lmu.github.io/lecture_i2ml)

# WHAT IS A MODEL?

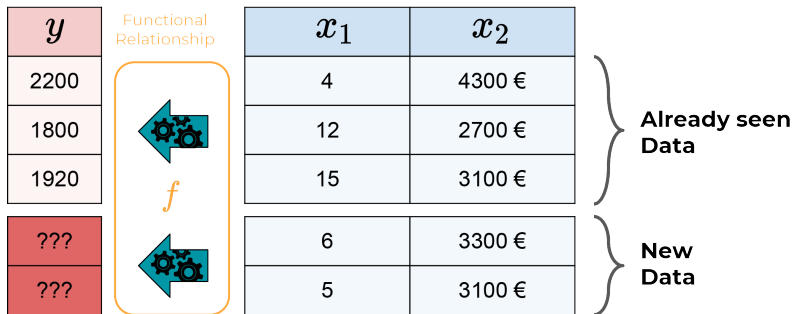
A **model** (or hypothesis)  $f : \mathcal{X} \rightarrow \mathbb{R}^g$  is a function that maps feature vectors to predictions.

( $g = 1$  in conventional regression, for classification see later.)

A hypothesis space  $\mathcal{H}$  is a set of such functions and defines a model class.



# WHAT IS A MODEL?



In supervised ML, we want to learn the function  $f$  **automatically from labeled data**, to apply it to new data.

# WHAT IS A LEARNER?

A **learner** (also: *inducer*)

- takes a **training set**  $\mathcal{D} \in \mathcal{X} \times \mathcal{Y}$  with features, target
- gives back a **model**: a function  $f : \mathcal{X} \rightarrow \mathbb{R}^g$  from a given hypothesis space  $\mathcal{H}$ .

