

# 1. Model Representation

August 5, 2021

## 1 Notation

- $x^{(i)}$  - denotes the input variable
- $y^{(i)}$  - denotes the output
- $(x^{(i)}, y^{(i)})$  - denotes a training example
- $(x^{(i)}, y^{(i)}); i = 1, \dots, m$  - denotes a training set
- $X$  - the space of input values
- $Y$  - the space of output values

## 2 Mathematical Definition of Supervised Learning

Given a training set to learn a function  $h : X \rightarrow Y$  so that  $h(x)$  is a good predictor of the corresponding  $y$

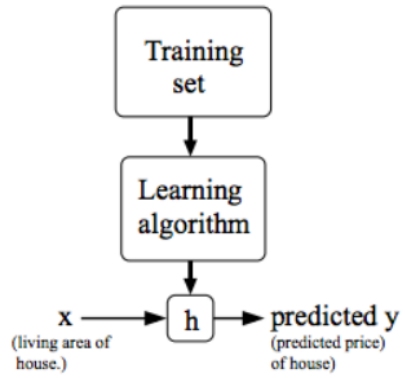


Figure 1: Graphical illustration of the mathematical representation of supervised learning - a training set goes through a learning algorithm which produces a function able to translate input of  $x$  to an output of  $y$

The function  $h$  is called the hypothesis

When the target (i.e. the predicted  $y$  value) we are trying to predict is continuous the learning problem is known as a regression problem, when the target takes on a discrete value it is called a classification problem