

# Chapter - 2

## Is Learning Feasible ?

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### 1 Introduction

Artificial Intelligence refers to the ability to perform tasks that typically require human intelligence, such as learning, reasoning, problem-solving and decision-making. Machine Learning is a major subset of AI that is focused on the development of algorithms that can **learn the underlying patterns from data without requiring explicit programming**. The title of the first chapter : learning from data, thus faithfully describes what the subject is about.

### 2 Perceptron

Continuing with our example from the finance domain, let us begin by looking at the given data. The data is available to us in the form of  $N$  input-output pairs :

$$(\mathbf{x}_1, y_1), (\mathbf{x}_2, y_2), (\mathbf{x}_3, y_3) \dots (\mathbf{x}_N, y_N)$$

Here  $y_n \in \{+1, -1\}$  represents the binary decision of approving or rejecting the loan request and  $\mathbf{x}_n$  is the application information of the  $n^{th}$  customer, which is represented by a column matrix as shown below :

$$\mathbf{x}_n = \begin{bmatrix} x_1 \\ x_2 \\ \cdot \\ \cdot \\ x_d \end{bmatrix}$$

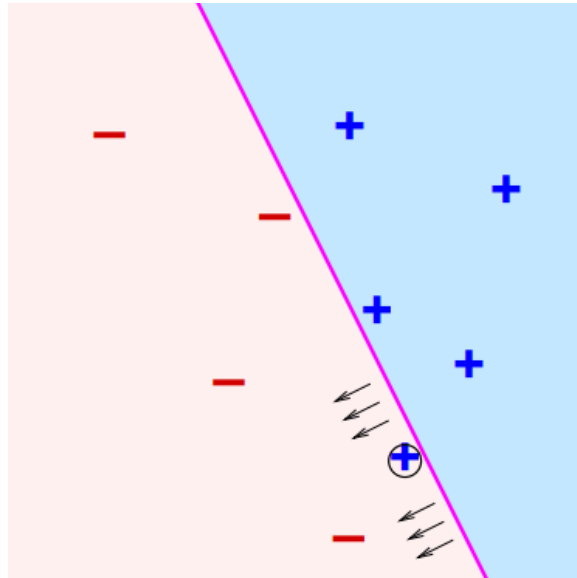


Figure 1: Perceptron

### 3 References

1. CalTech Machine Learning Course - CS156, Lecture 2.