

- Supervised techniques are divided into two categories namely, **Classification** and **Regression**.
- The objective of both techniques is **Prediction**.

► Classification vs Regression

- Differs in Mapping function: $C = f(D)$.
- Class variable in Classification is **categorical / discrete** in nature while in Regression, it is **continuous / numerical** in nature.

INTRODUCTION TO CLASSIFICATION AND REGRESSION I

The key objective of supervised learning is to make predictions. More formally, in supervised learning the aim is to learn a function f based on input variables, X to get an outcome or target variable, C , refer Equation 6.

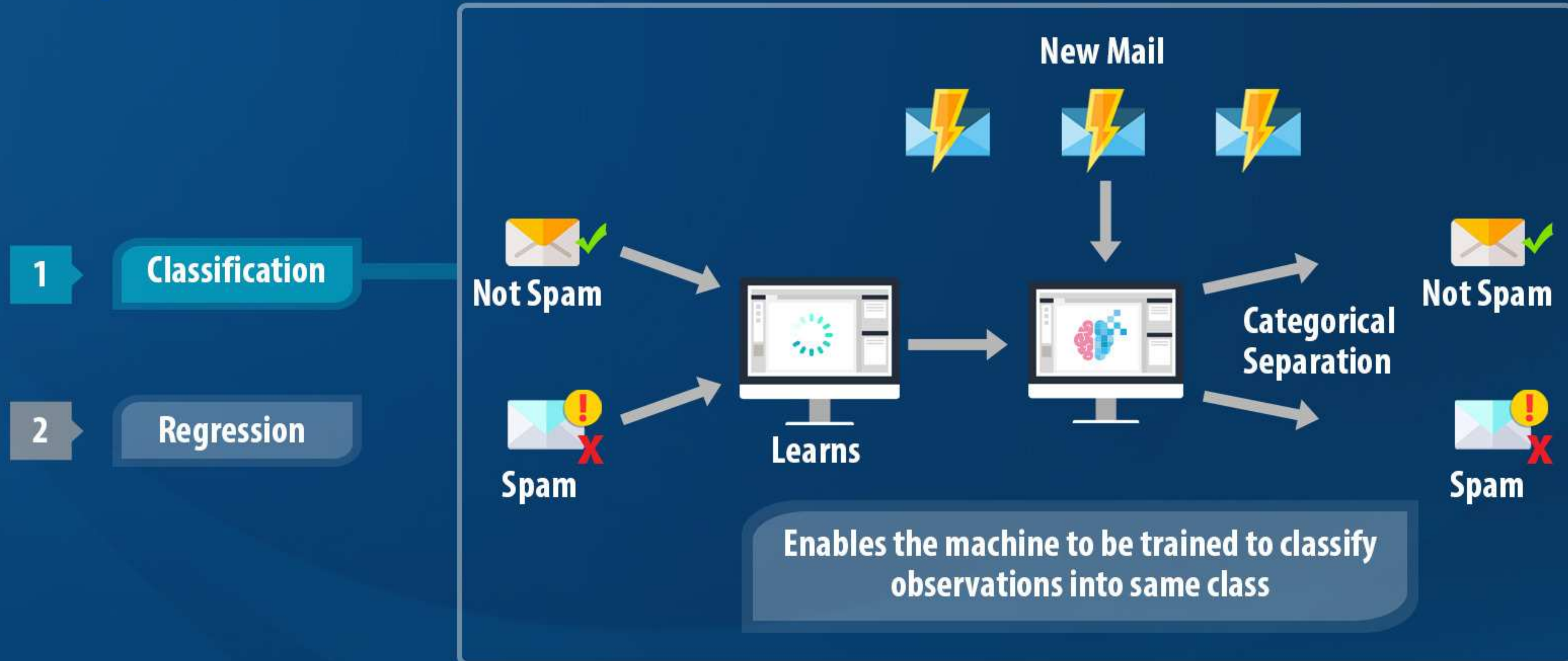
$$C = f(X) \quad (6)$$

- The two techniques of supervised learning are
 1. Classification
 2. Regression

Classification and Regression differ in the data type of target feature C . In case of Classification, variable C is categorical in nature where, Regression works only when C is numerical.

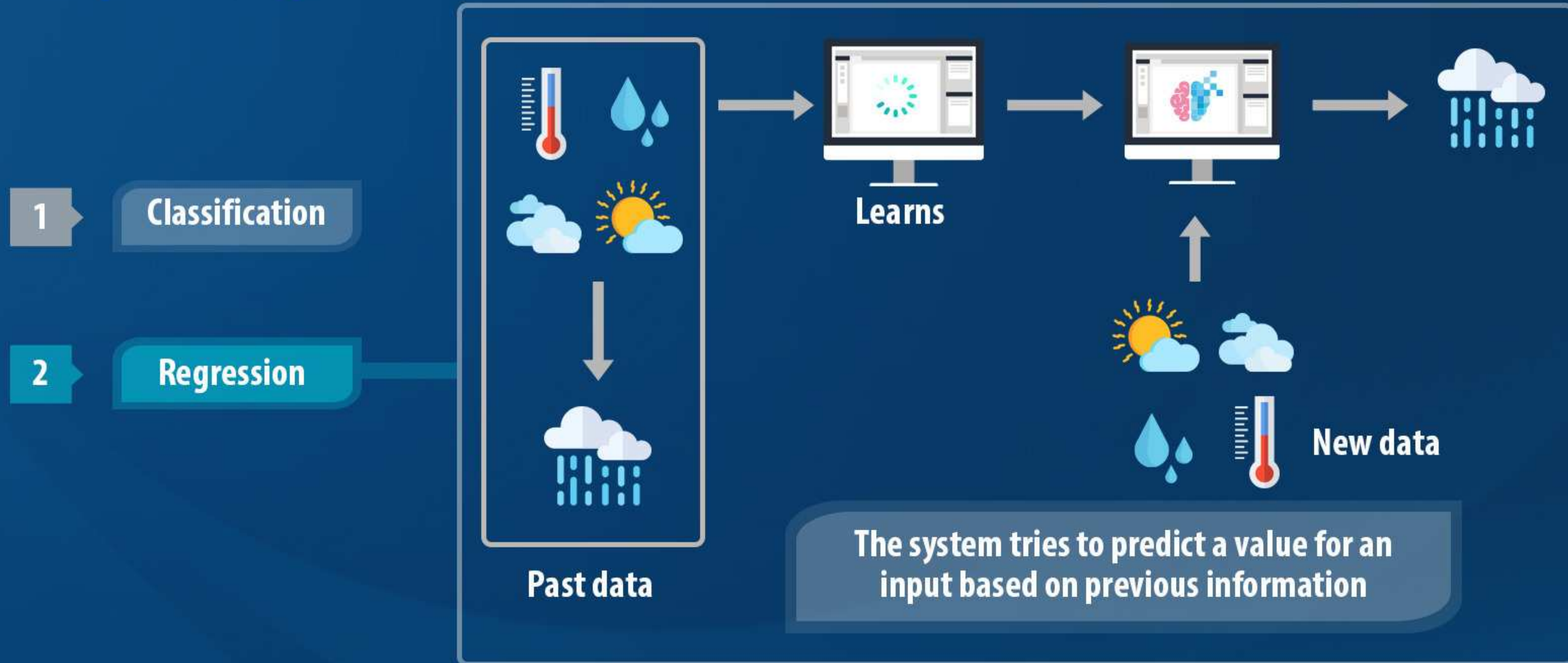
INTRODUCTION TO CLASSIFICATION AND REGRESSION II

Example of Classification



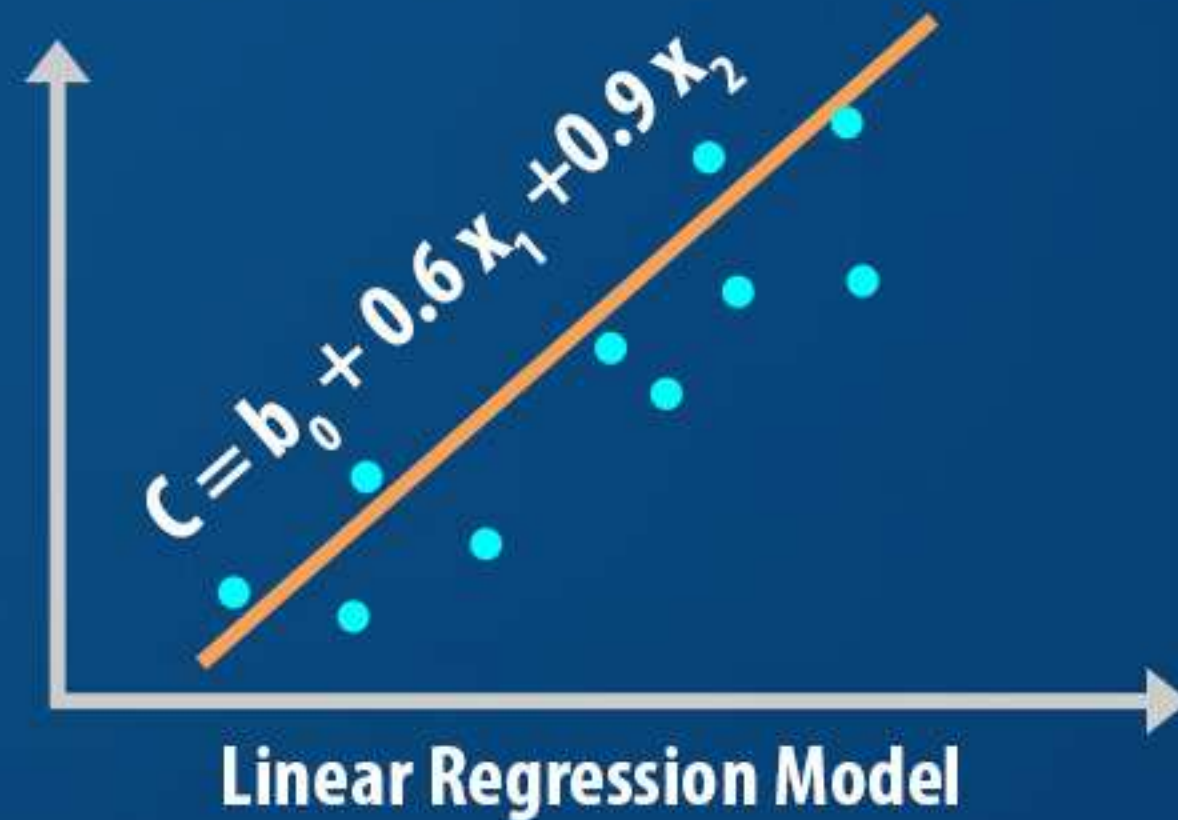
INTRODUCTION TO CLASSIFICATION AND REGRESSION III

Example of Regression



INTRODUCTION TO CLASSIFICATION AND REGRESSION IV

What differ between supervised algorithms are their approach in learning function f from the data to give the best results



x_1	x_2	C
-	-	-
-	-	-

Dataset

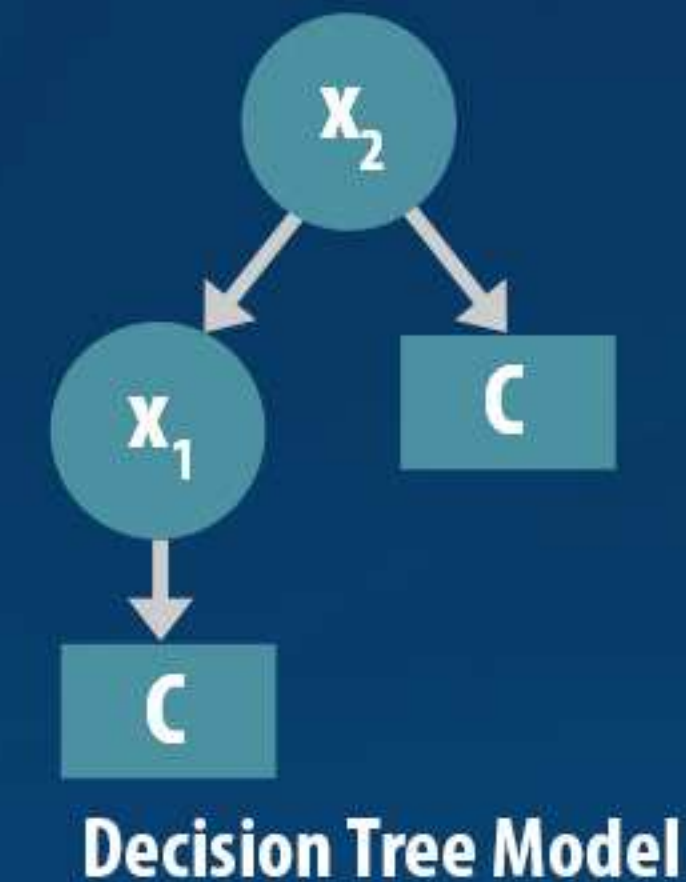
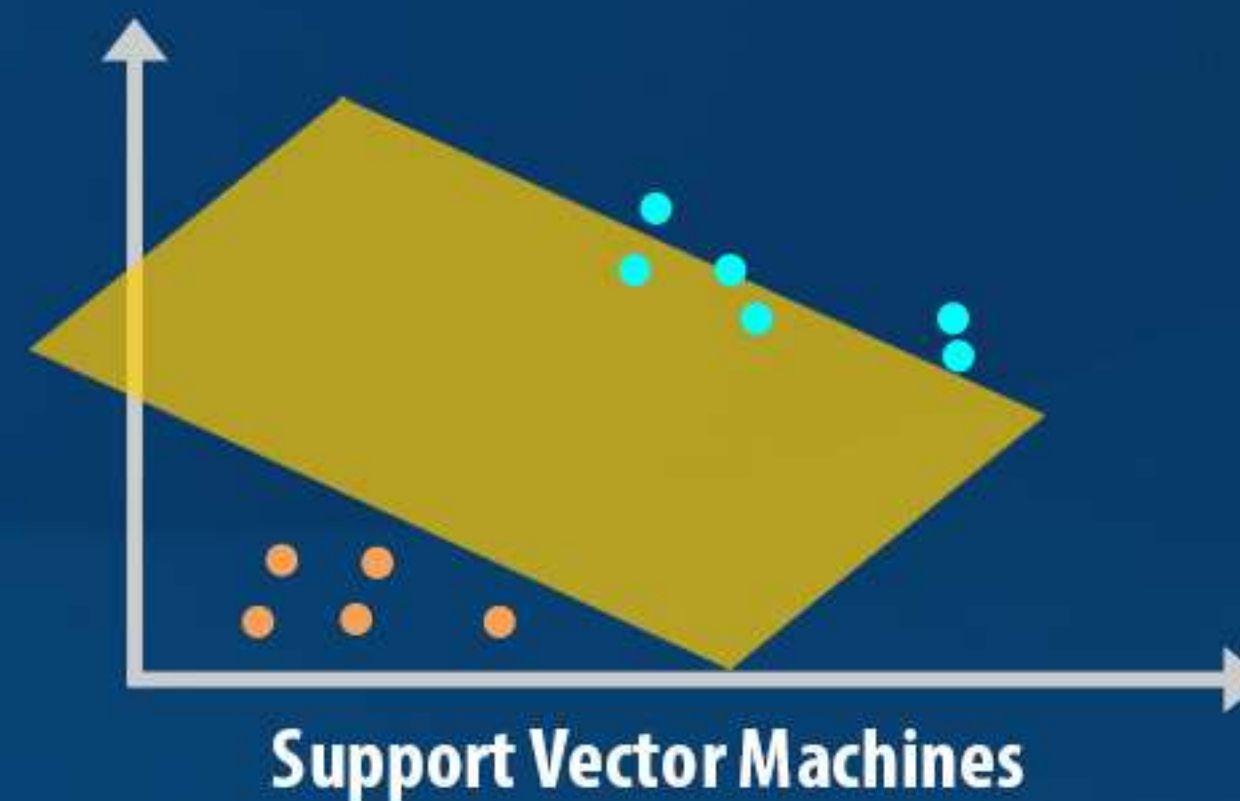
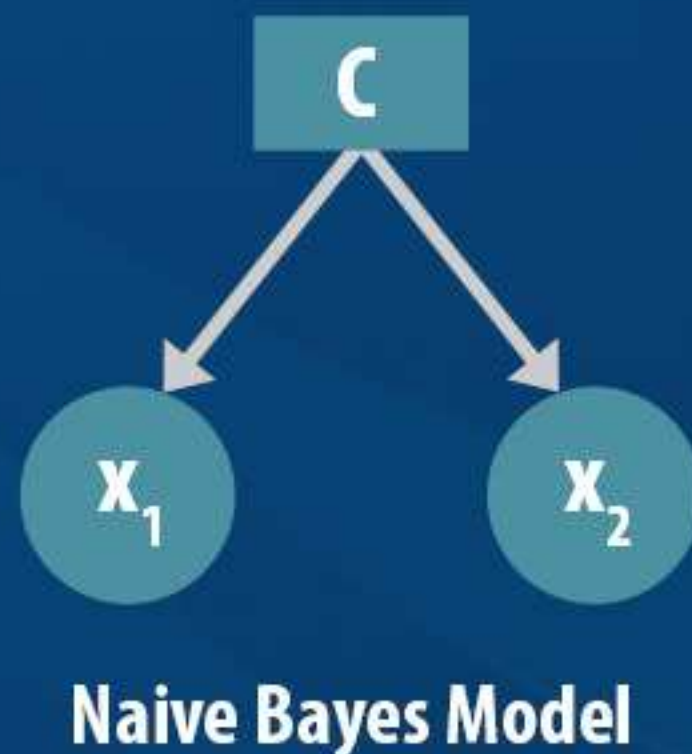
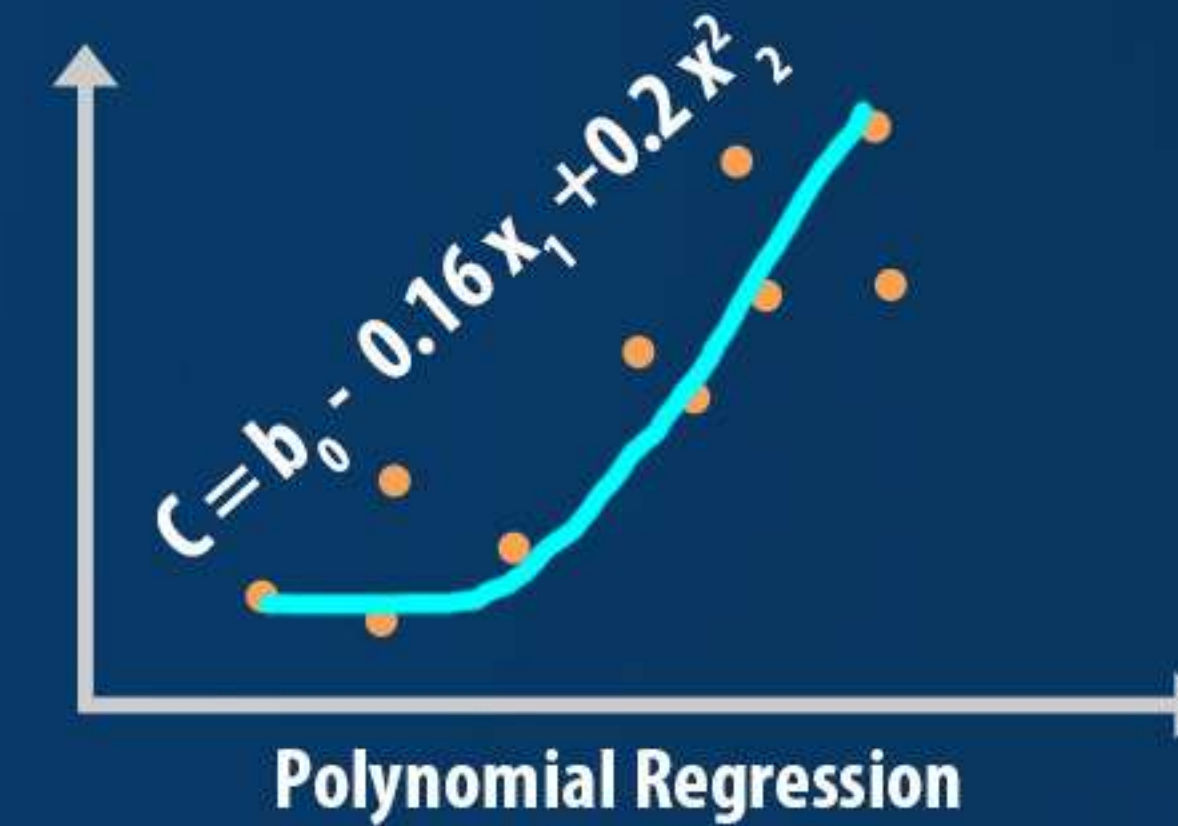


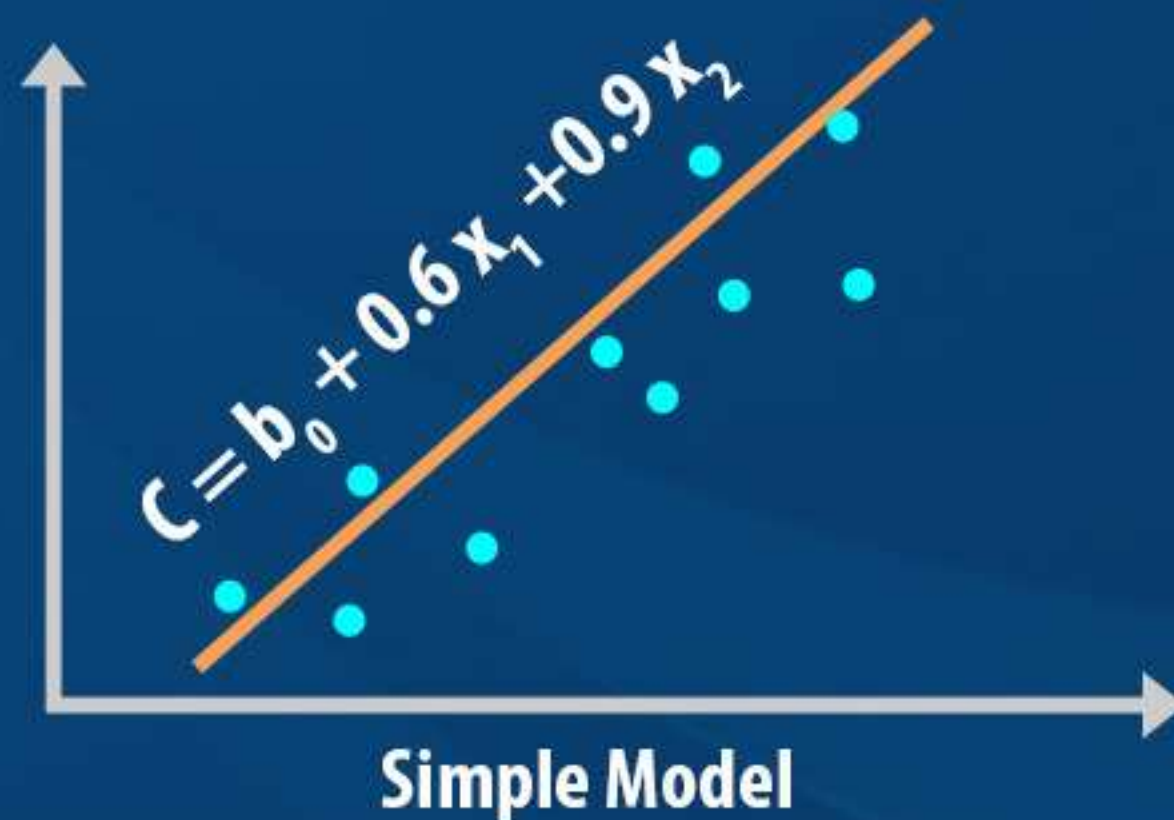
Figure 29: Different models (or learning function f) from the same data set

INTRODUCTION TO CLASSIFICATION AND REGRESSION V

The key characteristics of learning function f

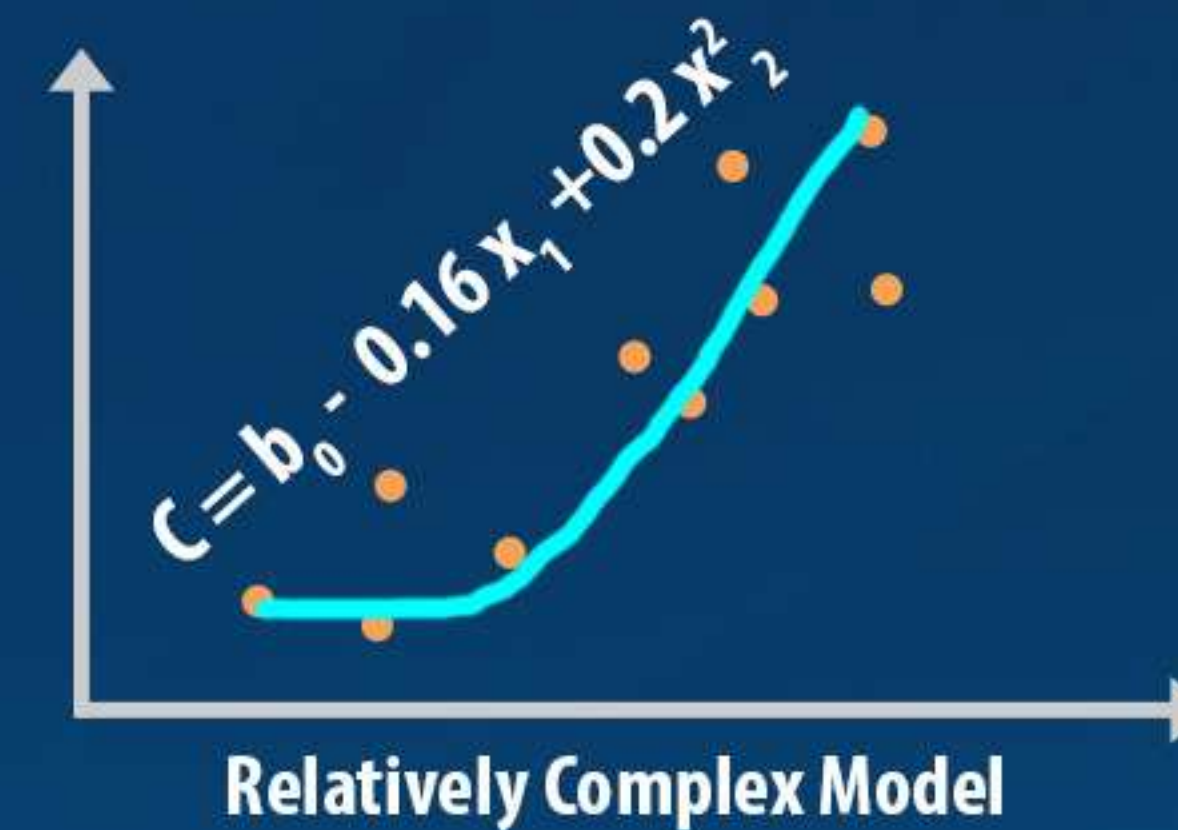
1. Simple:

- Easy to interpret
- Represents the true nature of data,
- Efficient and good performance



x_1	x_2	C
-	-	-
-	-	-

Dataset



INTRODUCTION TO CLASSIFICATION AND REGRESSION VI

2. Robust:

- Simple
- Represents the true nature of data
- Efficient with consistent/stable performance



Figure 31: Inconsistency in performance of Machine Learning (ML) model on different data set of same application