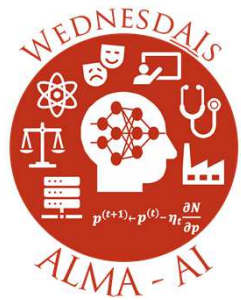


# Supervised Machine Learning

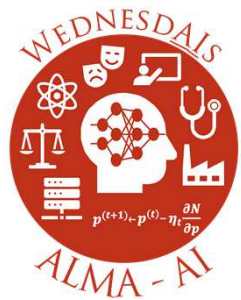


Learning is constructing or modifying representations of what is being experienced

[Michalski 1986]

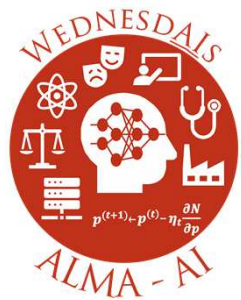
Learning denotes changes in the system that are adaptive in the sense that they enable the system to do the same task or tasks drawn from the same population more efficiently and more effectively the next time

[Herbert A. Simon, 1983]



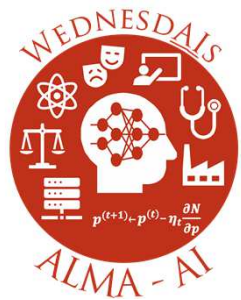
It's all very well to speak of adaptation over time, but how can this be quantified?

*Machine Learning, Game Play, and Go, David Stoutamire*



We do believe that there is a process that explains the data we observe.

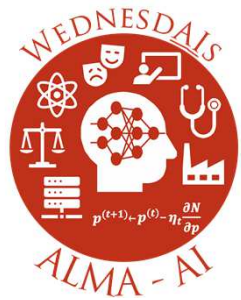
*Introduction to Machine Learning Ethem Alpaydm, 2004*





**Observations**

**Objective:  
Events - Facts**



**Event / Fact**

$$= f(\text{Take a look..})$$

$$y = f(x)$$

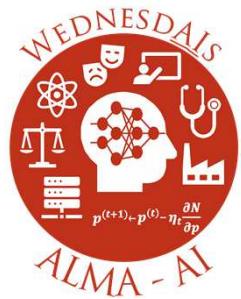


...at the end

With a new observation  $x'$

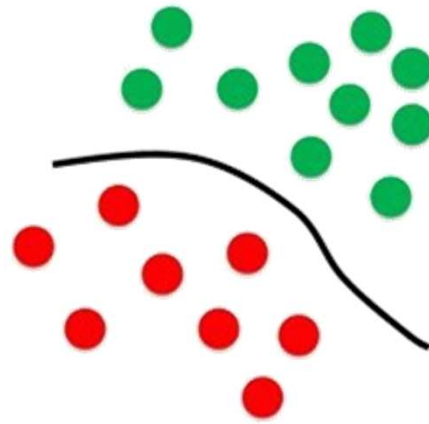
$$f(x') = y'$$

**Accuracy:**  $y - y'$

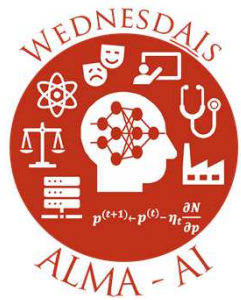
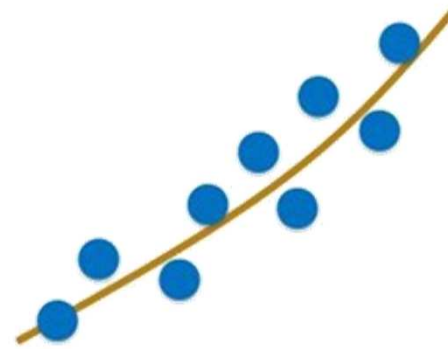


# Classification vs Regression

Classification



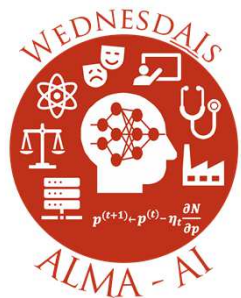
Regression



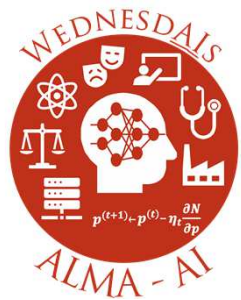
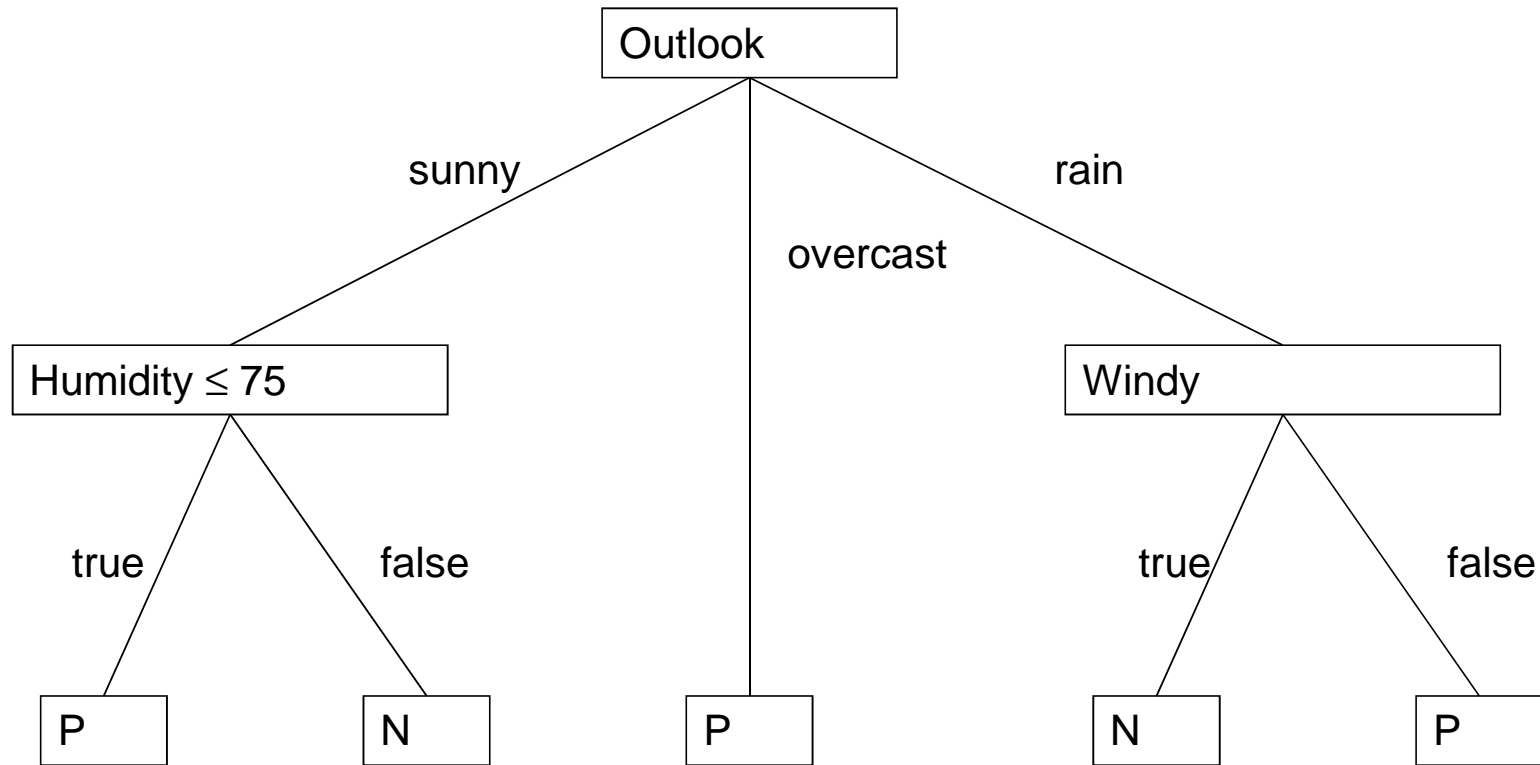


# Classification Example

No	Outlook	Temp (°F)	Humid (%)	Windy	Class
D1	sunny	75	70	T	P
D2	sunny	80	90	T	N
D3	sunny	85	85	F	N
D4	sunny	72	95	F	N
D5	sunny	69	70	F	P
D6	overcast	72	90	T	P
D7	overcast	83	78	F	P
D8	overcast	64	65	T	P
D9	overcast	81	75	F	P
D10	rain	71	80	T	N
D11	rain	65	70	T	N
D12	rain	75	80	F	P
D13	rain	68	80	F	P
D14	rain	70	96	F	P



# Classification Example



# Regression Example

Forecast of production from renewables

Data: time series

