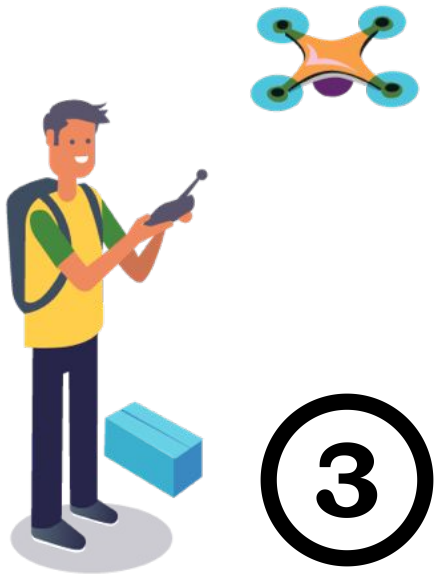
Aiman Technologies

A creative initiation from singularity

Insight..!

Introduction to machine learning

1



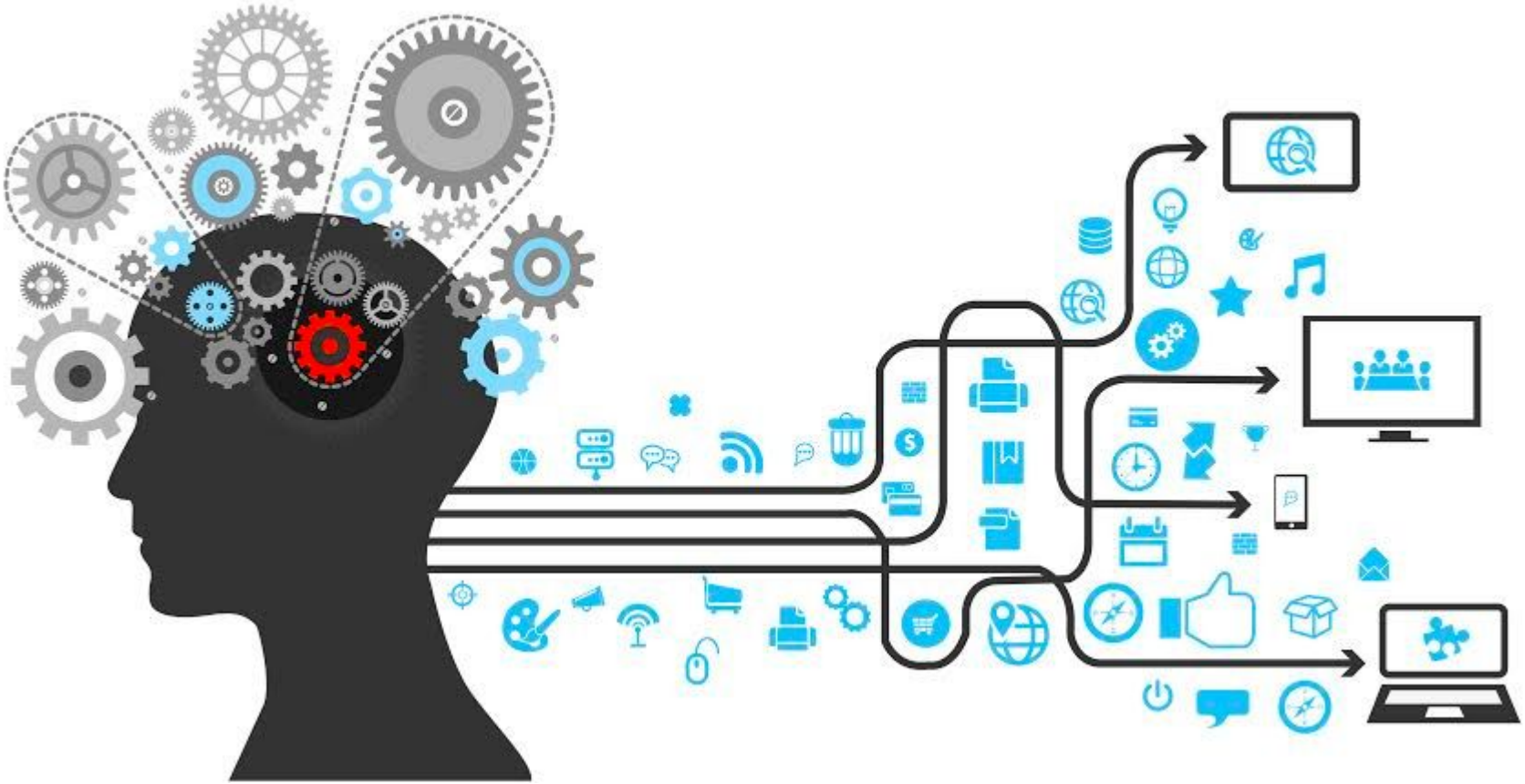
3

Applied machine learning example

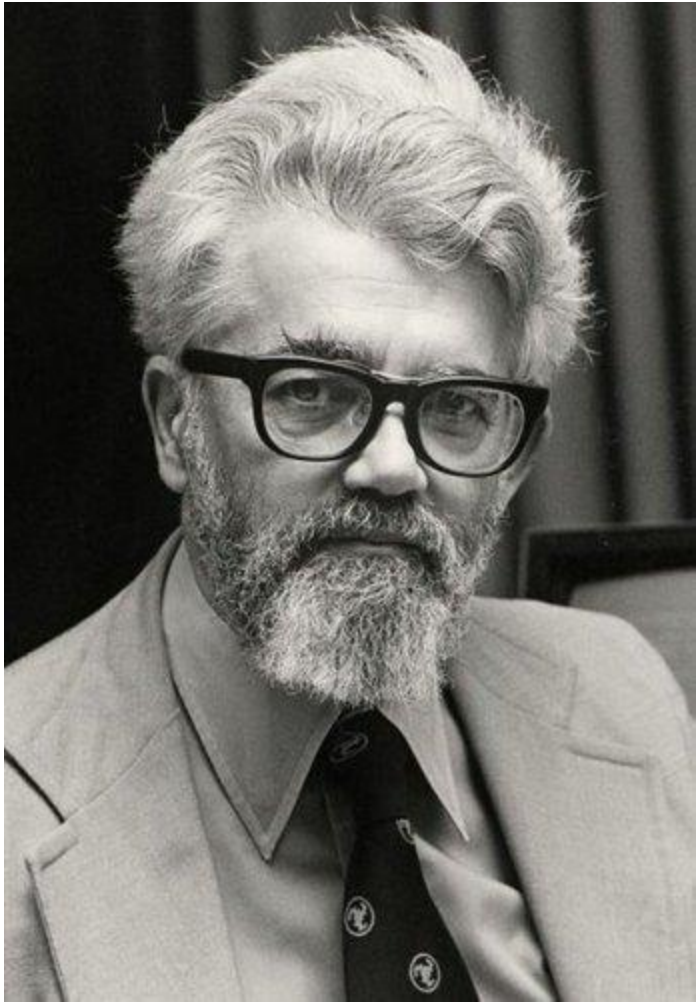
How to learn the basics

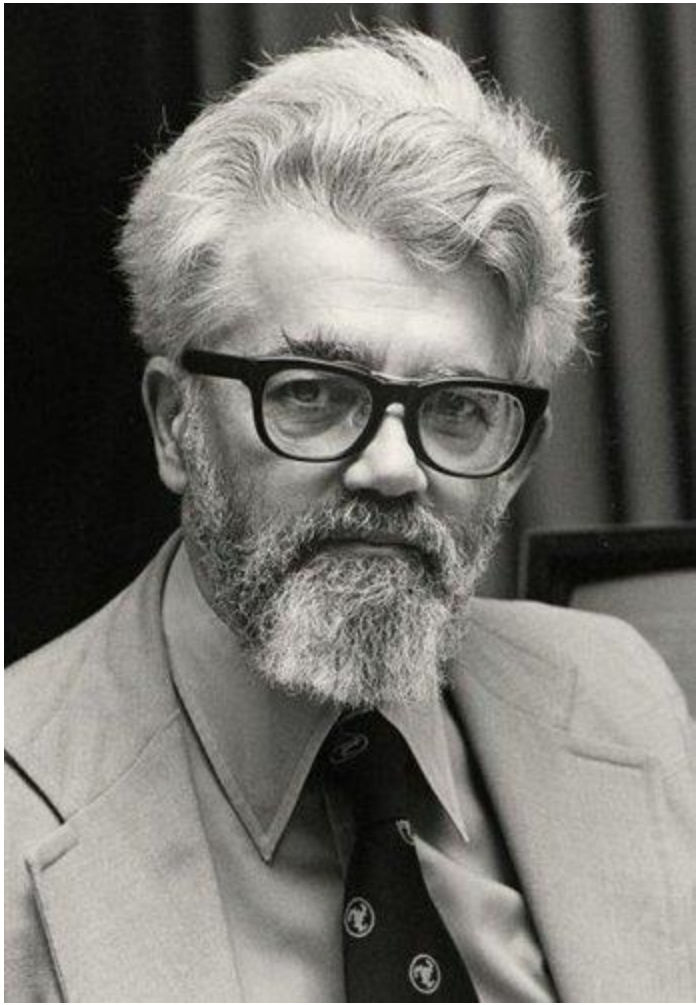
2

Let's start..



What is meant by Artificial intelligence….!





John McCarthy

“The science and engineering of making intelligent machines, especially intelligent computer programs”.

What is meant by machine learning

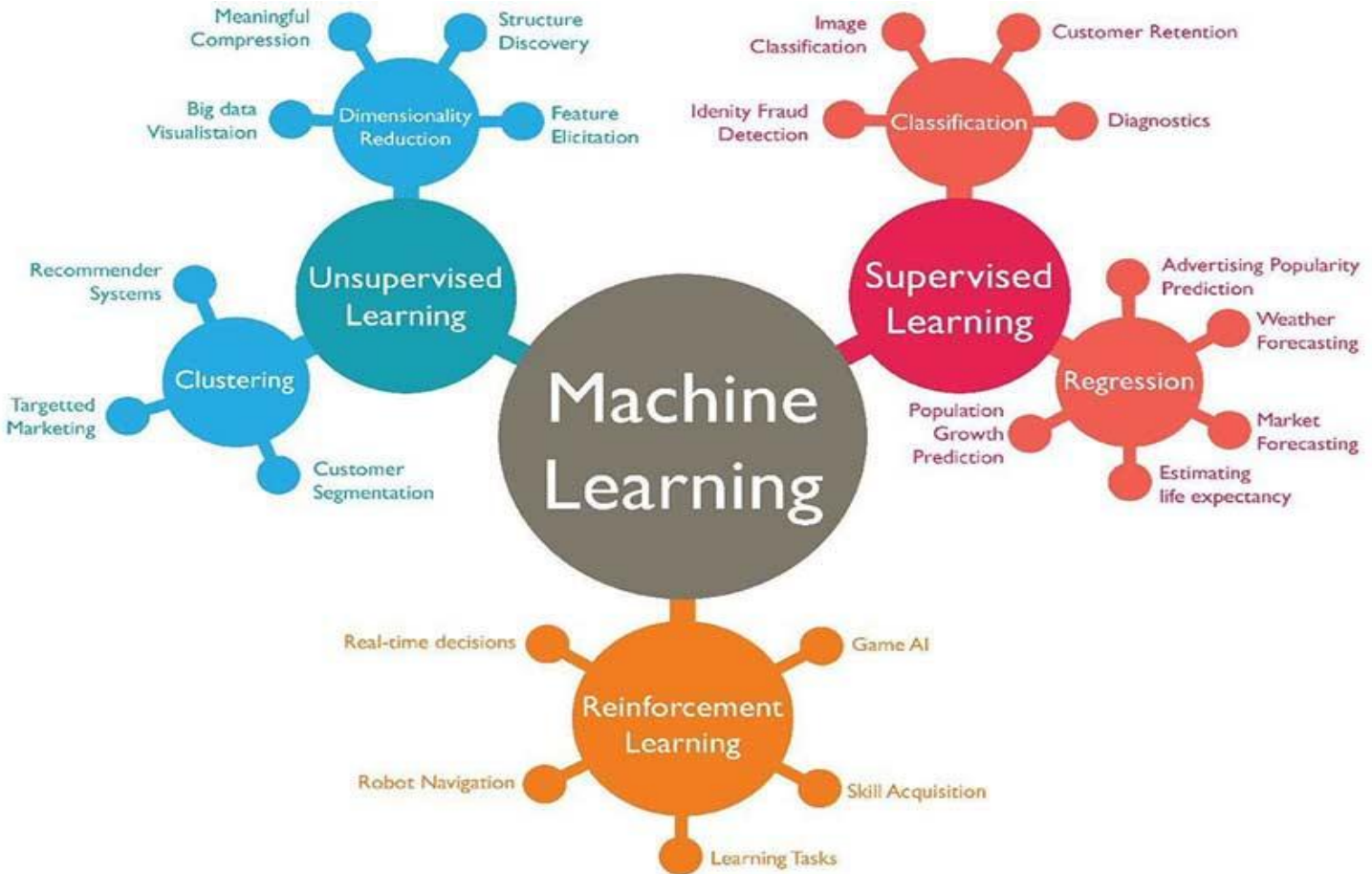
Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed.

- Learning = Improving with experience at some task
  - Improve over task *T*,
  - With respect to performance measure, *P*
  - Based on experience, *E*.

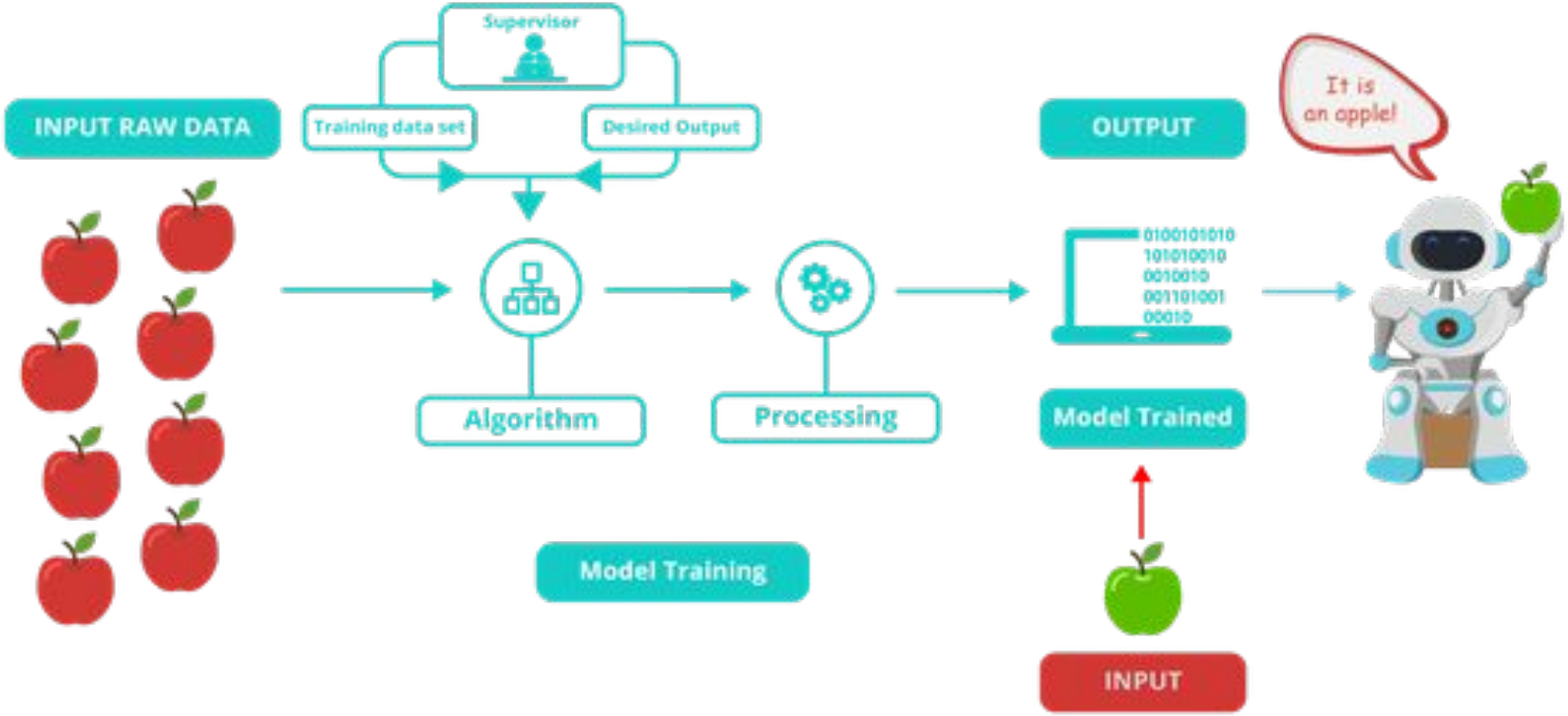
Why now?

- Flood of available data (especially with the advent of the Internet)
- Increasing computational power
- Growing progress in available algorithms and theory developed by researchers
- Increasing support from industry.

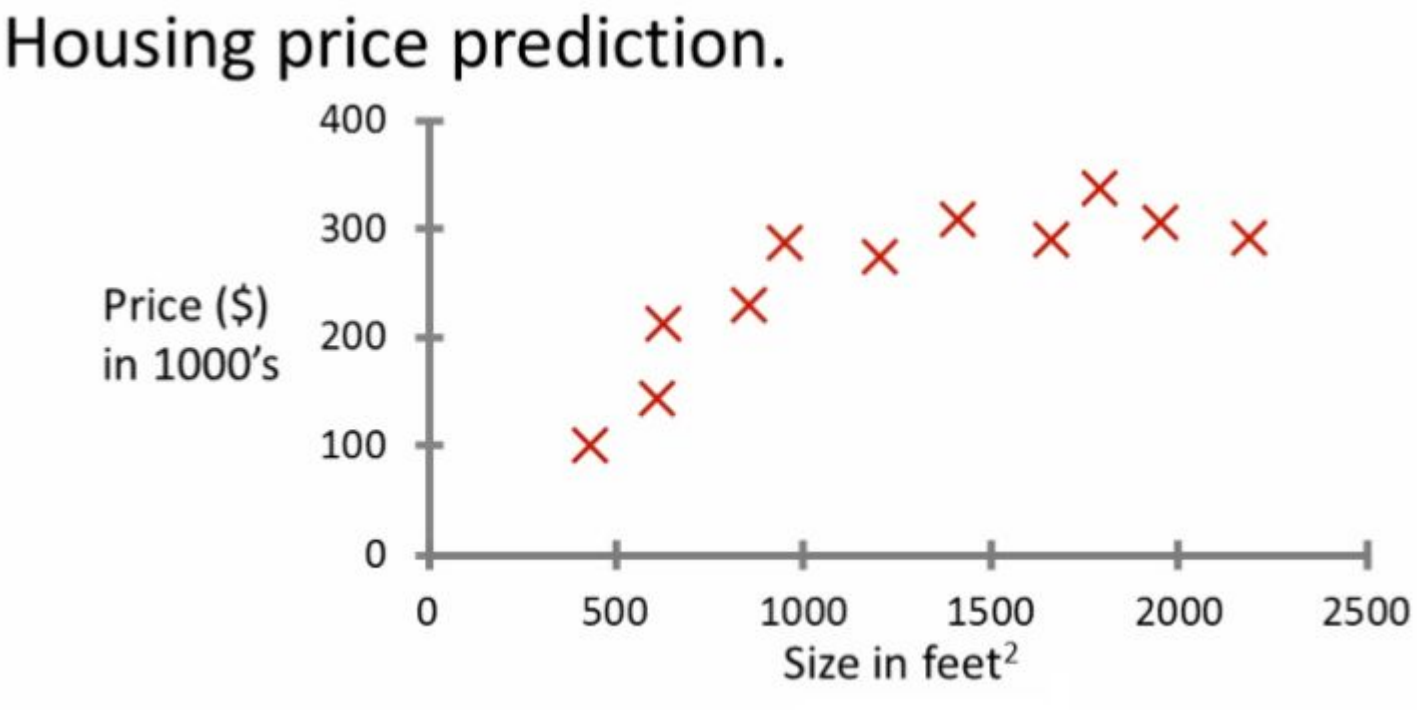
Machine learning classification



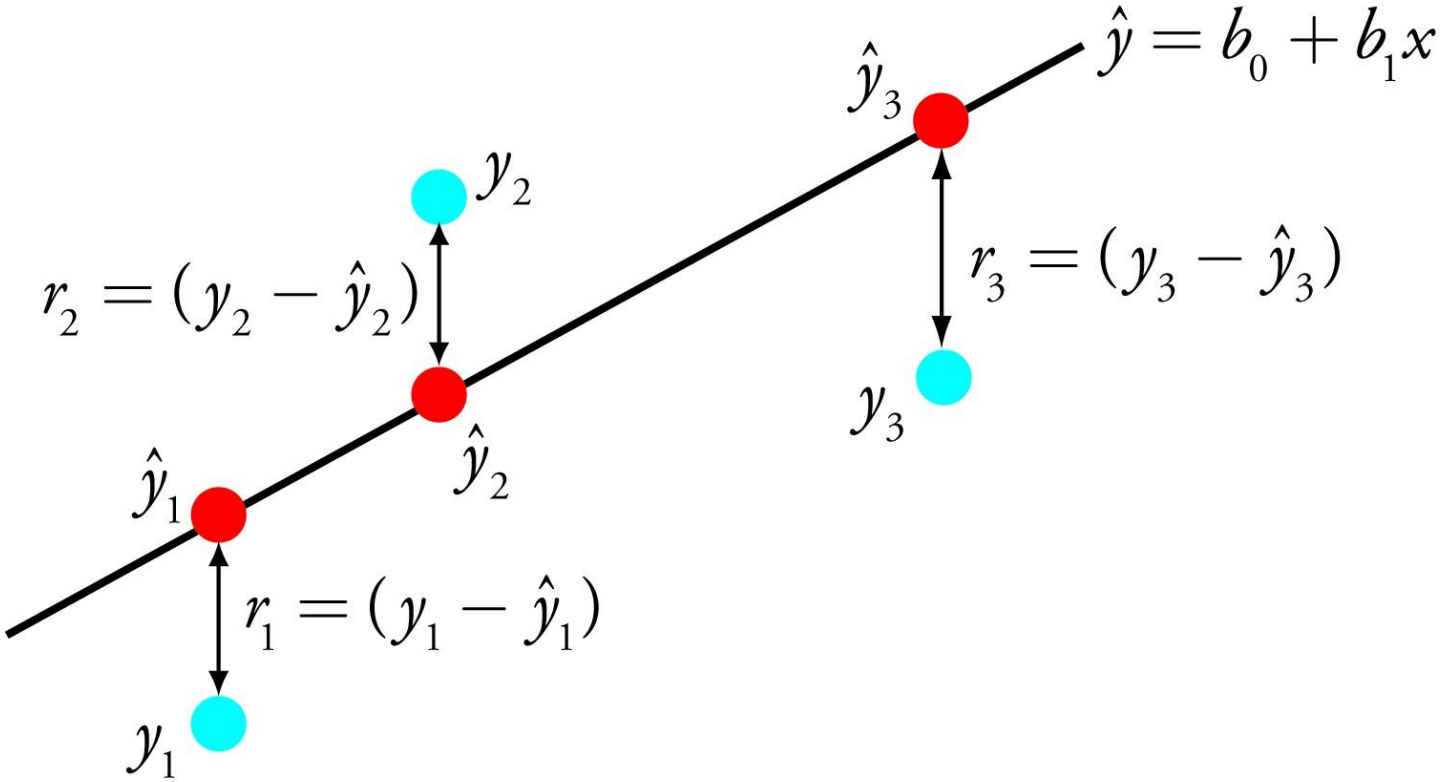
Supervised machine learning



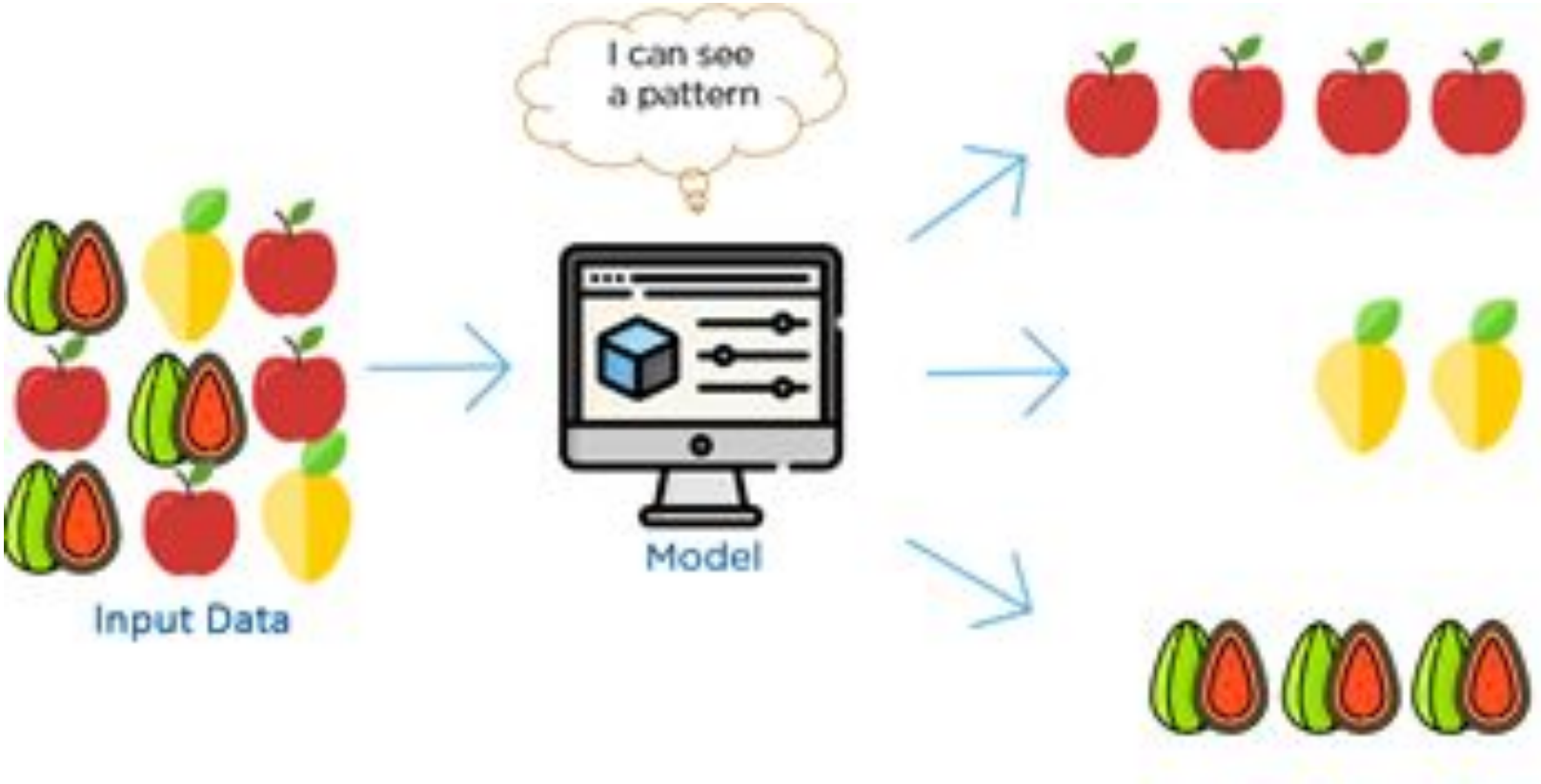
Regression


Housing price prediction.
Price ($) in 1000's
400
300
200
100
0
0
500
1000
1500
2000
2500
Size in feet²

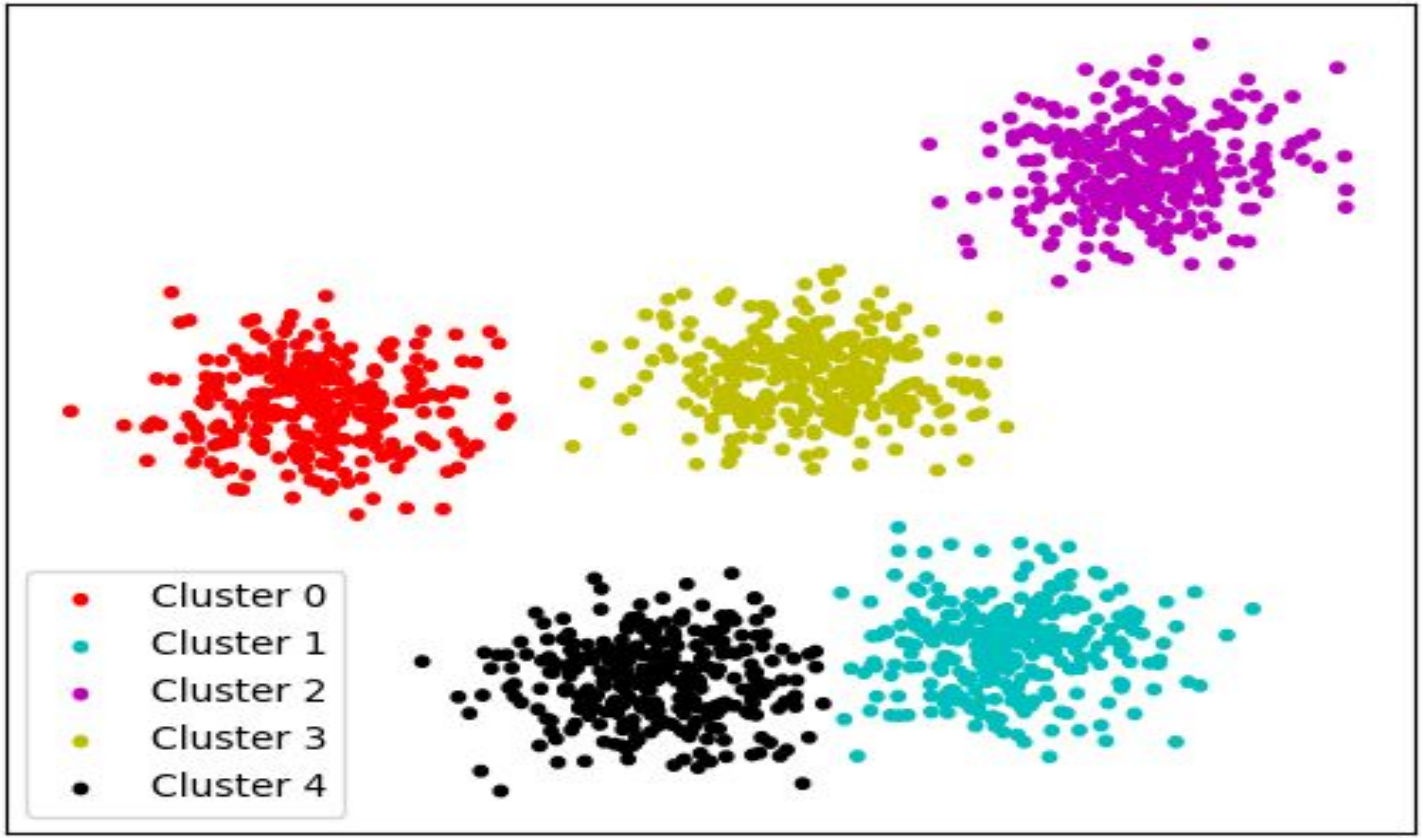
Regression


$\hat{y} = b_0 + b_1 x$
$\hat{y}_3$
y_2
$r_2 = (y_2 - \hat{y}_2)$
$r_3 = (y_3 - \hat{y}_3)$
y_3
$\hat{y}_2$
$\hat{y}_1$
$r_1 = (y_1 - \hat{y}_1)$
y_1

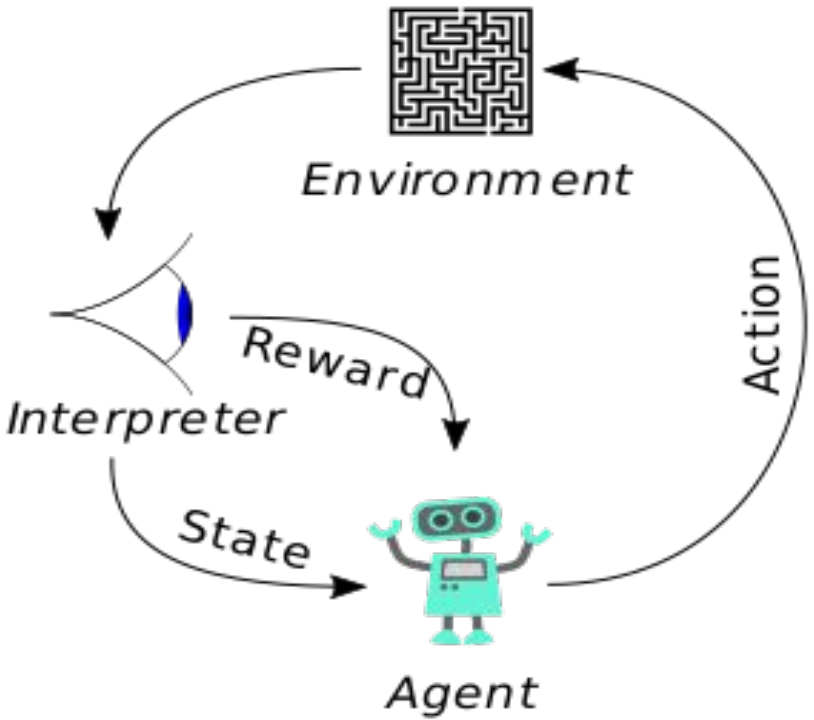
Unsupervised machine learning



clustering

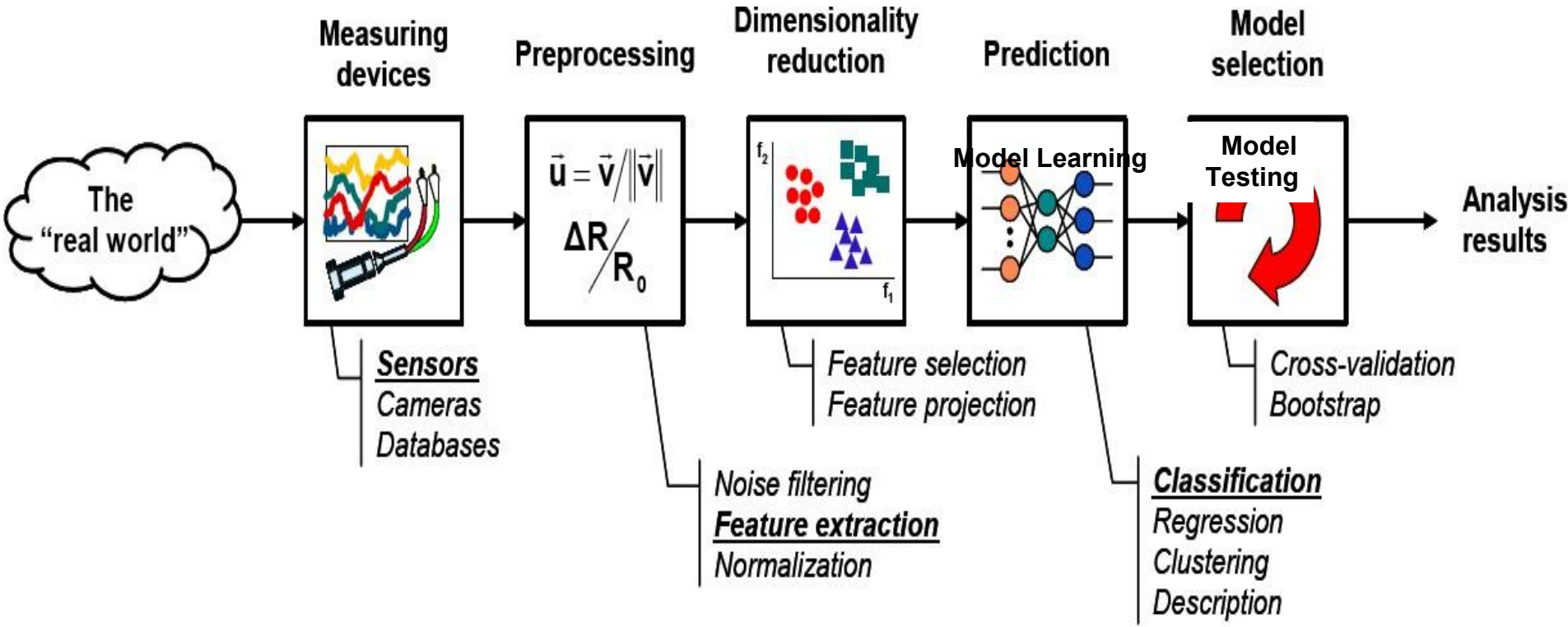


Reinforcement learning

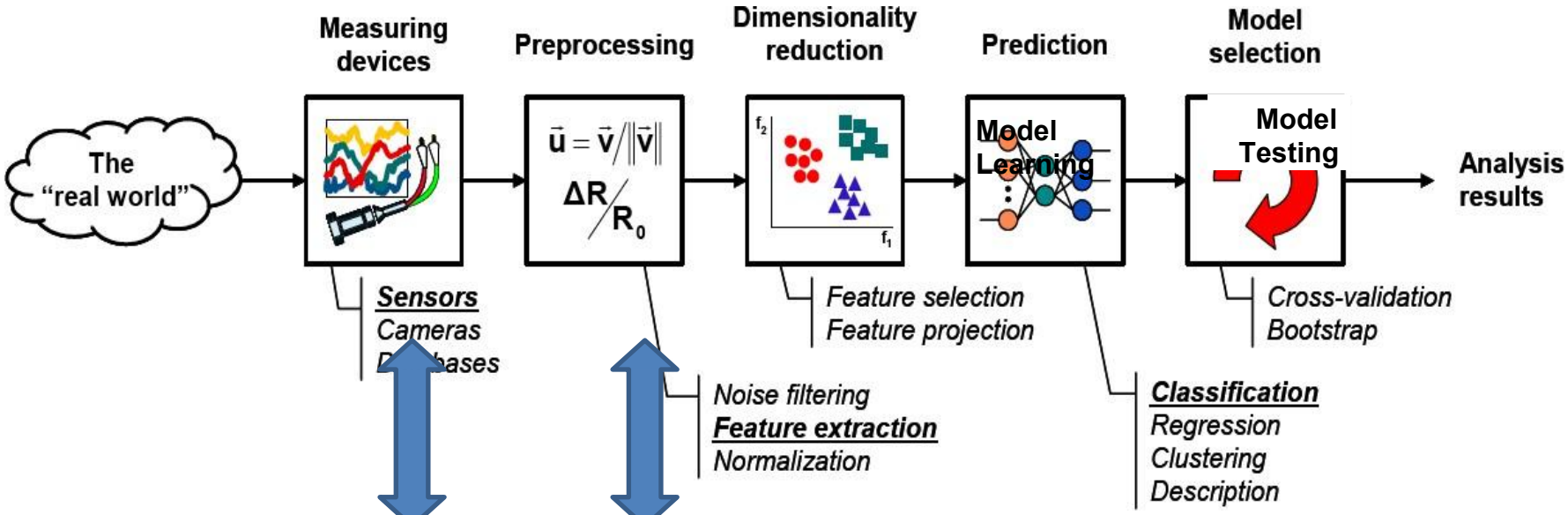


an agent takes actions in an environment, which is interpreted into a reward and a representation of the state, which are fed back into the agent.

The Learning Process



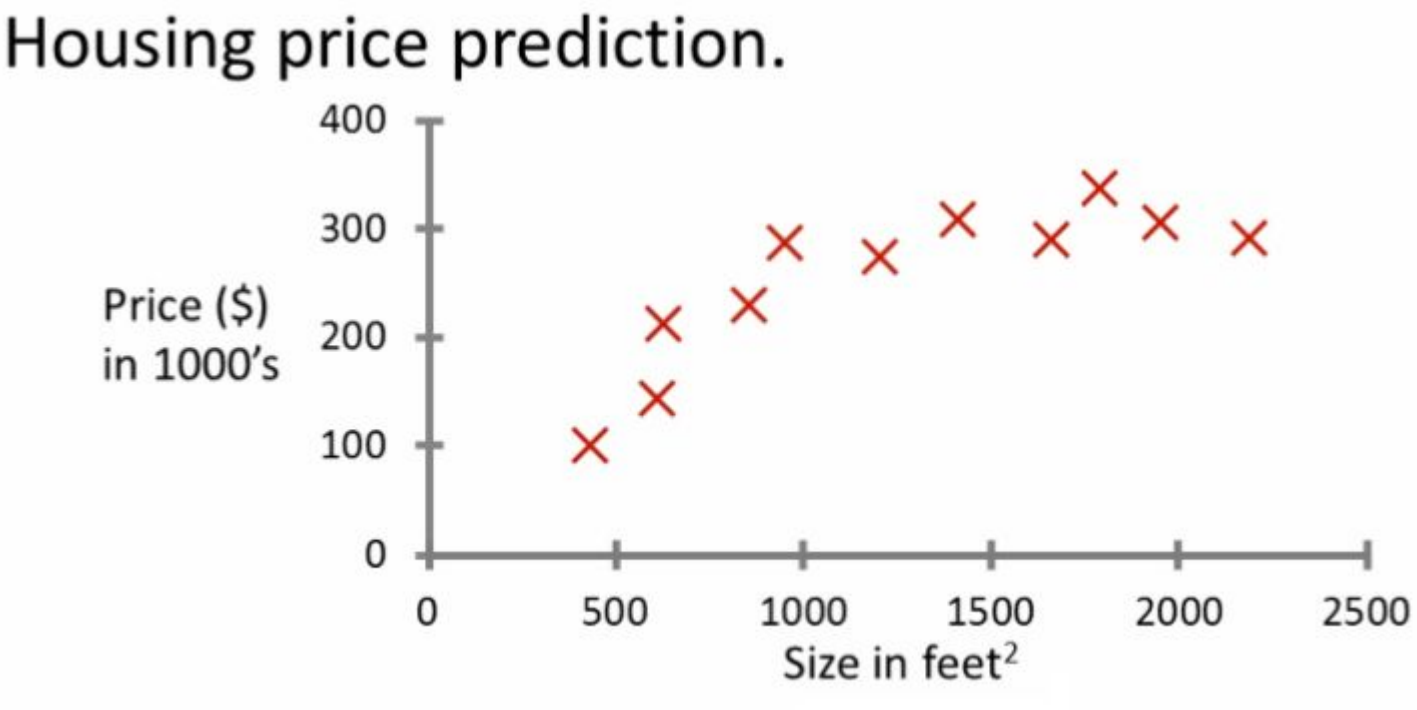
The Learning Process in our Example



Email

- Number of recipients
- Size of message
- Number of attachments
- Number of "re's" in the subject line

Linear regression



Training Set of Housing Pirces (Portland)

Size in sq.ft. (x)	Price ($) in 1000s (y)
2104	460
1406	232
1534	315
852	178
...	....

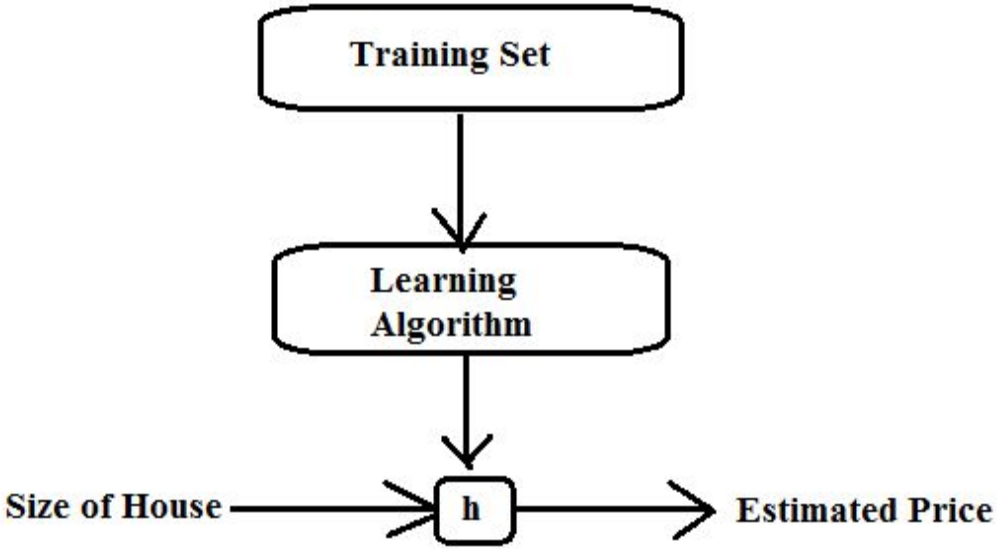
Notations -

m = Number of Training Examples

x's = "Input" variables/features

y's = "Output" variables/"target" variables

hypothesis



$$h_\theta(x) = \theta_0 + \theta_1(x)$$

Thanks for coming

Have a great day