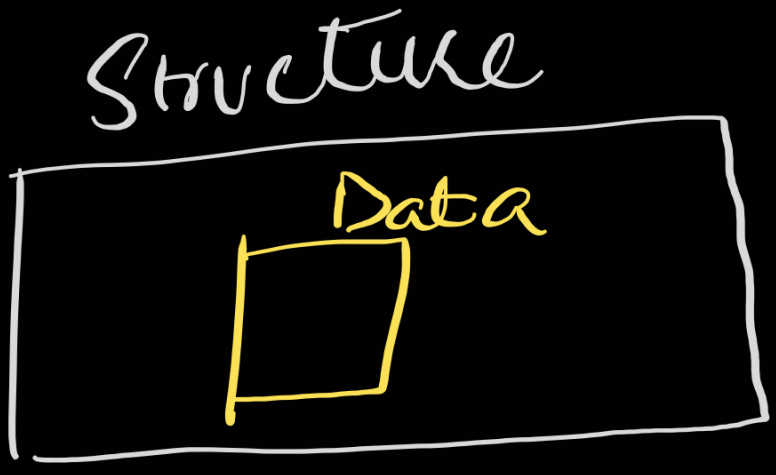
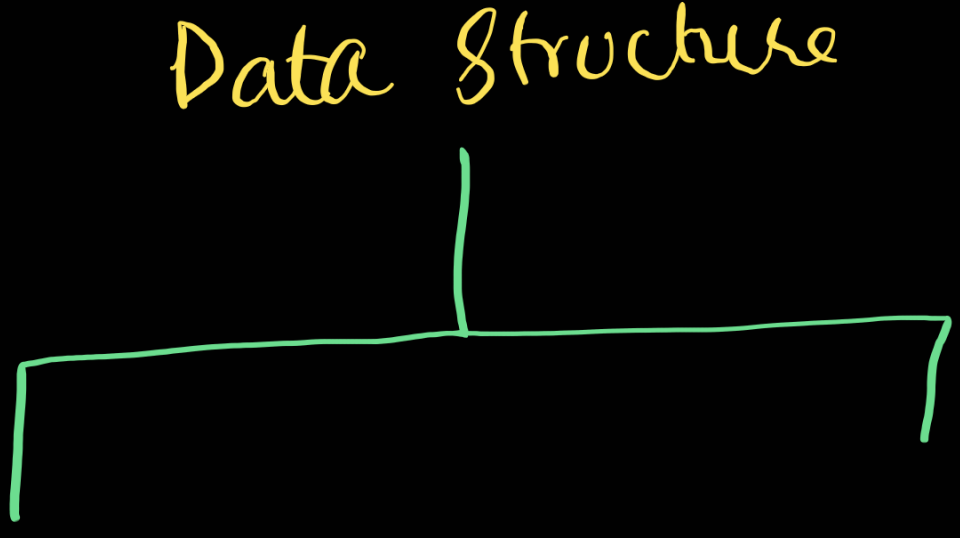
Linear Regression & optimization:





Training Set

(supervised)

Higher order func

Teaching the machine

process

Takes input as function & output function

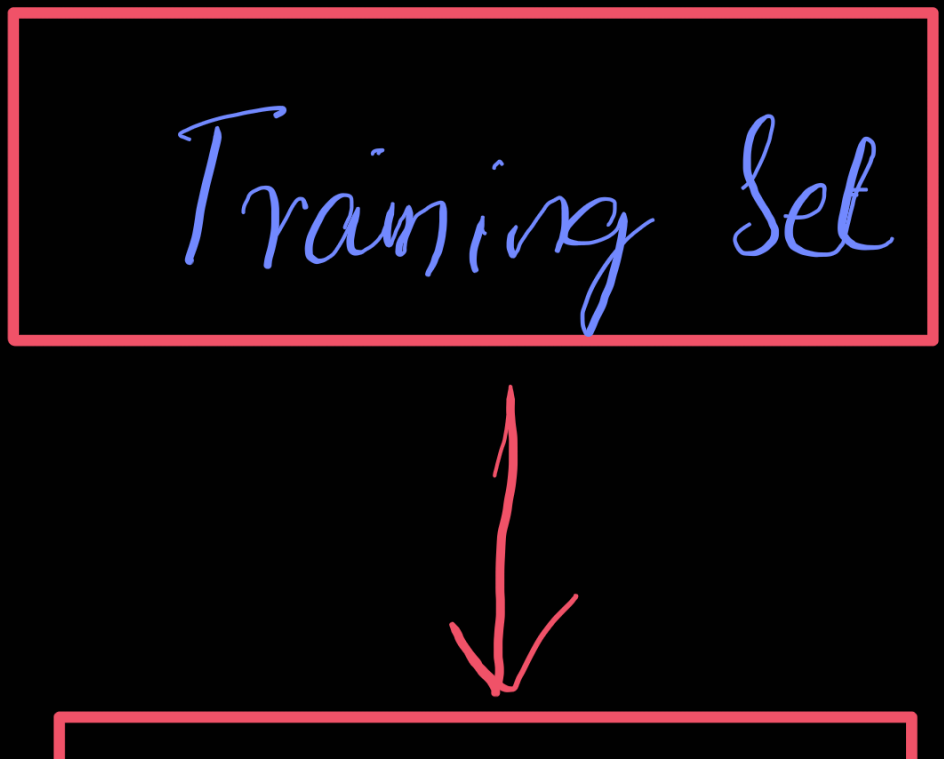
output

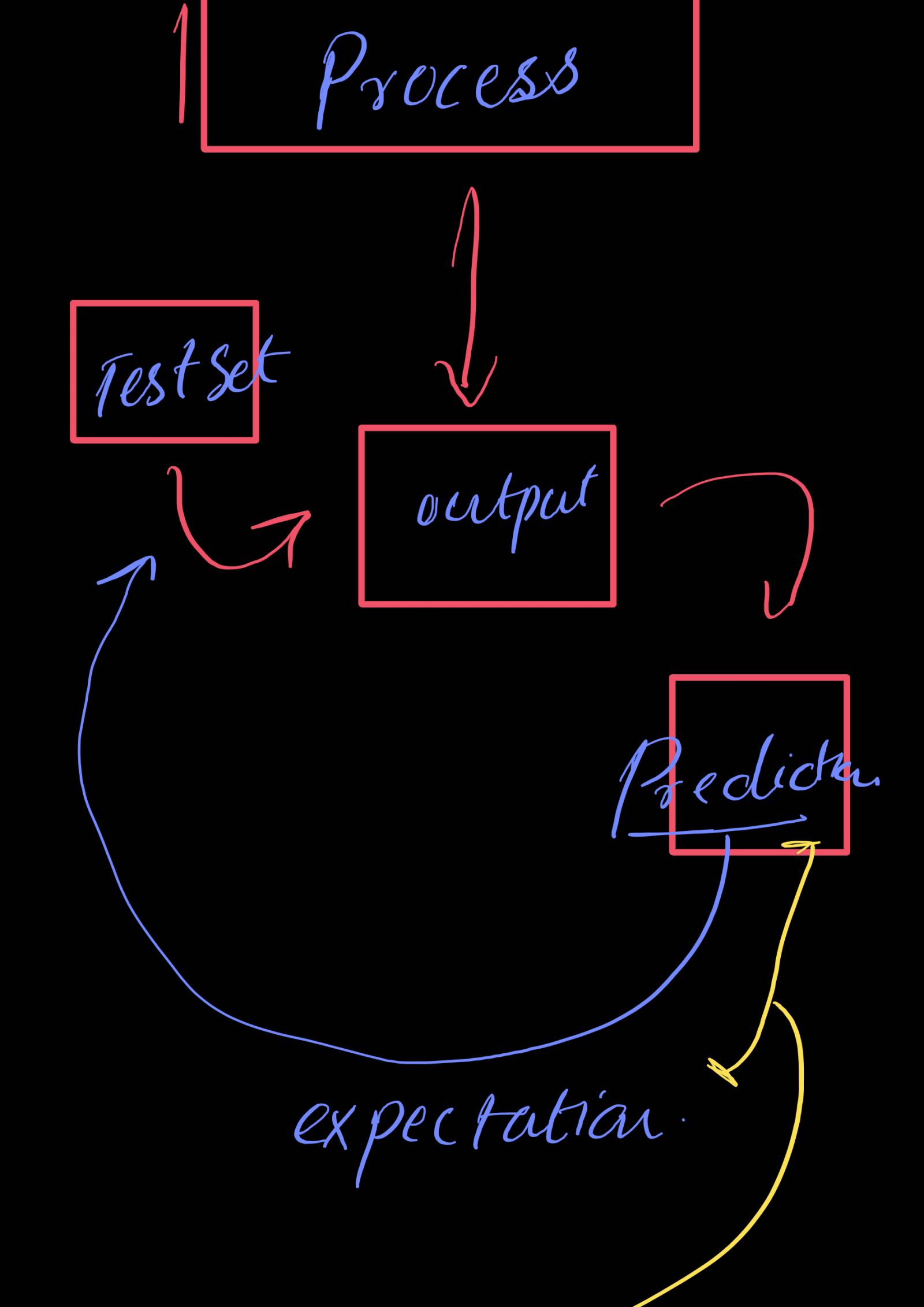
This output is our hypothesis

[What the machine learned.]

As we said the

output is also a function from the processed data. Mean it can also take same input.



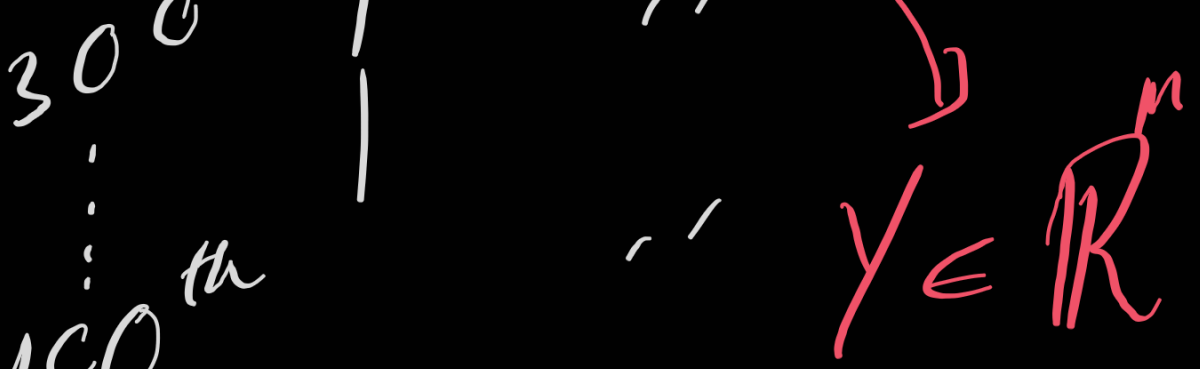

Process
Test Set
output
Predicted
expectation

The difference b/w prediction & expected is called Error / cost / energy.

Example

target / label
↗ output.

Area	price
100	"
200	"



we can write it as

$X \in \mathbb{R}^{m \times n}$

$m \rightarrow$ inputs (100)

$n \rightarrow$ no of feature (1)

Now the output

is $\in \mathbb{R}$

$y \in \mathbb{R}$

↓

Real num

↓

Continuous

↓

↑ Means its a problem

of Regression

Hypothesis

Model

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

[hypothesis's depending on theta.]

intercept

slope.

(what is the value of y when there is no value of x)

Parameters of models

Finding these

parameter is called **Fitting**

$$h_\theta(x) = \theta^T x$$

θ vector.

assuming $x_0 = 1$

Cost function

$$J(\theta_0, \theta_1) = \frac{1}{2m} \sum_{i=1}^{m} \left(h_\theta(x^i) - y^i \right)^2$$

cost
loss
error
energy

Degree of freedom :