Indep. Var
Predictor   — dep. Var.
                           — Predicted
    i/p   ←   ⌐ o/p

x	y
⌠	1	2
	2	5
Trained		3	6	Supervised
on this		4	9	Learning
data		5	10
	6	13
	7	14
         ⌞ | 8 | 17 |

              | 9 | ? | 18 | ⌉ Extracted
              | 10 | ? | 21 | ⌋ the rule

Machine Learning

— Make machines learn like humans

if x is odd:
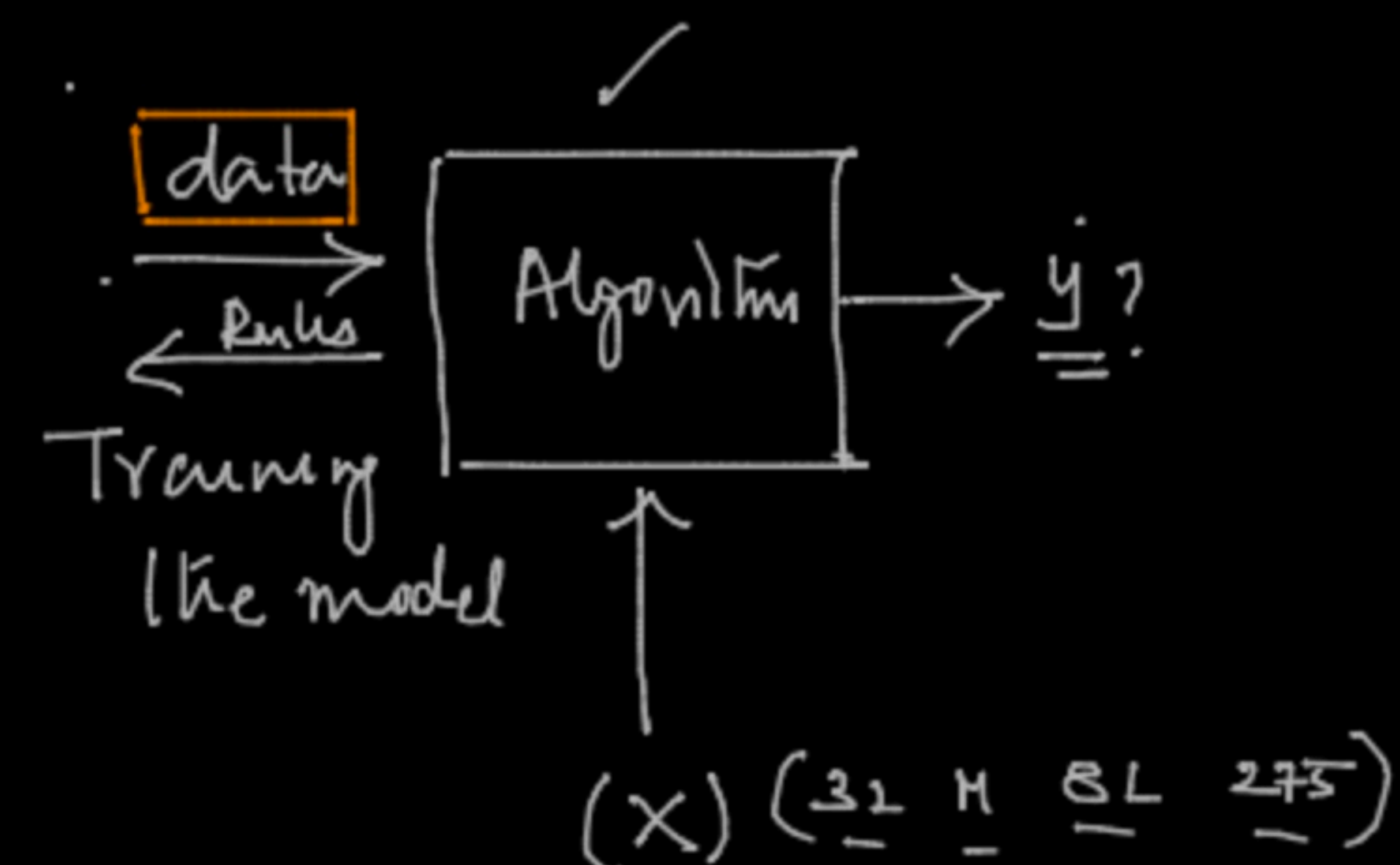$$y = 2x$$
elif x is even.
$$y = 2x + 1.$$

$$x \Rightarrow y$$

rules
→ [ ] → y ?
    ↑x
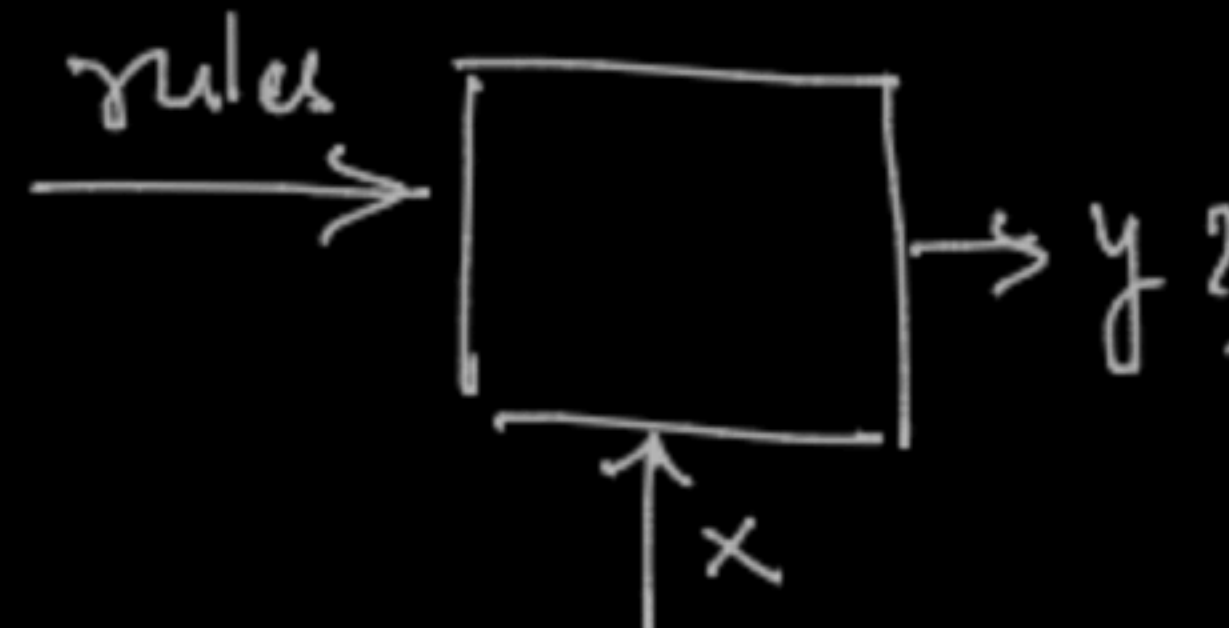
Traditional.

Data science —

Extracting info from data.

Understanding patterns in the data.

[data] → [Algorithm] → y ?
 ← Rules   =
Training
the model   ↑

$$(x) \left(\underline{32} \ \underline{M} \ \underline{BL} \ \underline{275} \right)$$

Machine Learning

	Age	Gender	Income	Credit score	Loan.
1					← y →
2		20 yo			Yes ✓
3					No ✓

10,000

Tom   Tim
                        (Text) → 20,000 yrs
⬜ Tom
⬜ Tm
⬜ Tm.
⬜ Tm
⬜ Tm
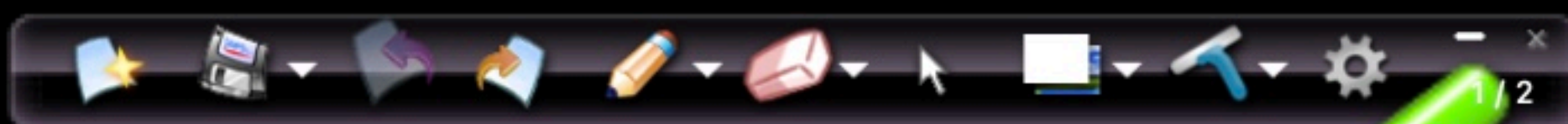
Machine Learning

Supervised   unsupervised.

— Predictions can be made.   — No predictions are made

                                              — only clustering | grouping

(x, y) → [Model] → y

Training phase.

Prediction Phase

x
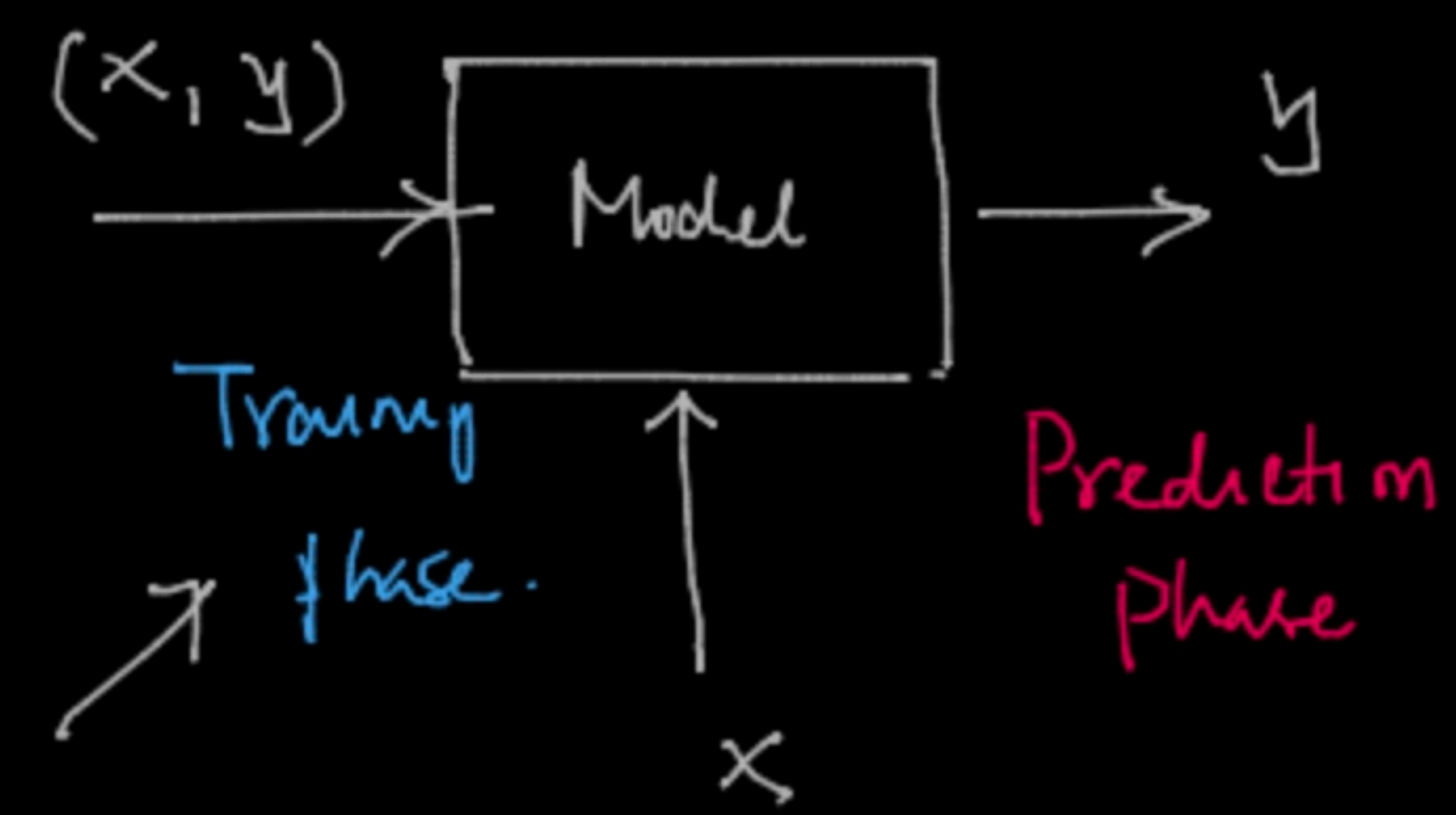
Model understands the rel bet y & x.

$$y = f(x)$$

Model

x → [Model'] → C1, C2, C3

Training phase
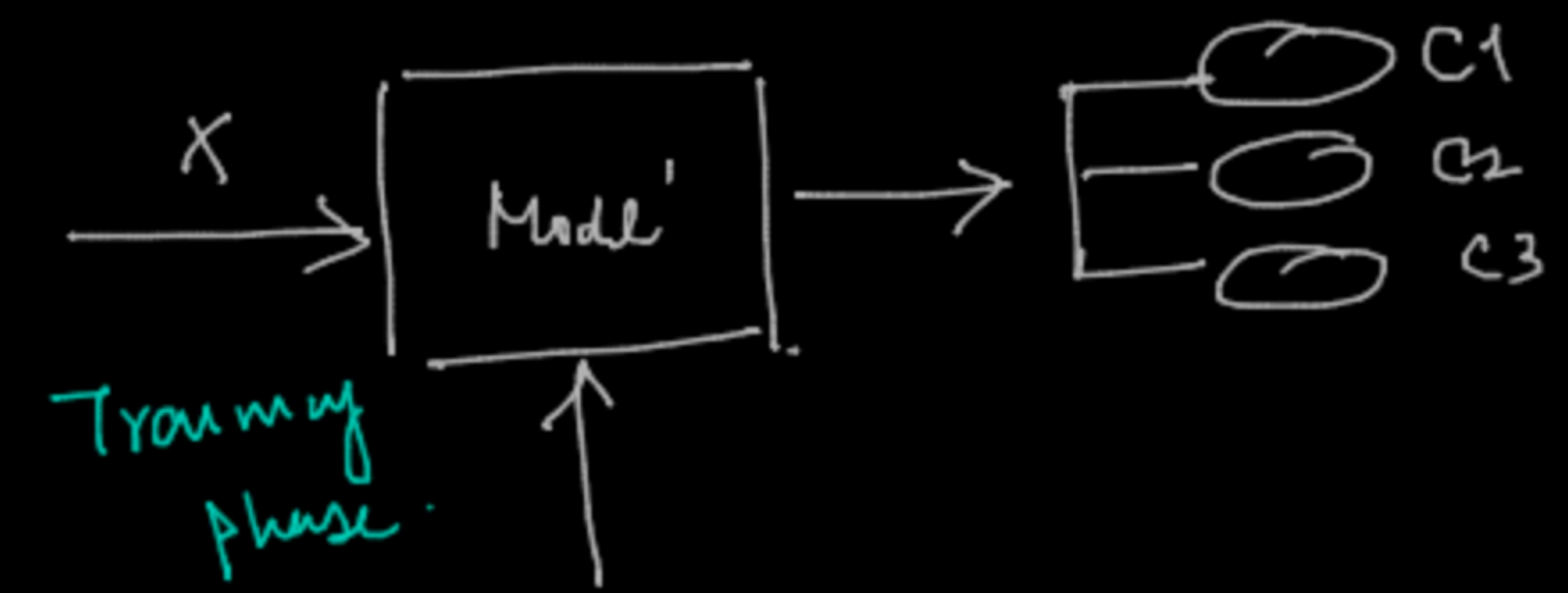
— group similar records

Artificial Neural Network

shallow
Deep Network
Deep learning

← Artificial Intelligence →

Image Processing

Language Processing
GPT
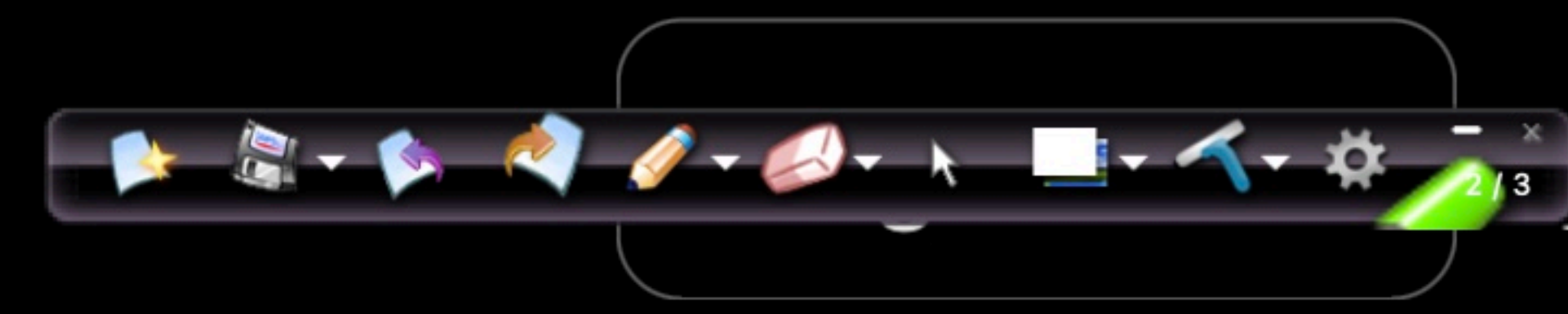
Features

← X →

Height   Wt

P₁   —   —

P₂   —   —

P₃   —   —

Wt ↑

P₇ × × P₂₃ × P₃₀ × × P₁ P₉
→ Height

Short & Slim

P₂ P₁₁ × × × P₂₅ × × P₁₃ P₆ — Tall & heavy

→ 2d dimension

Customer Segmentation

Sim

HI, LI → ⊙

C₂ → LI, HS
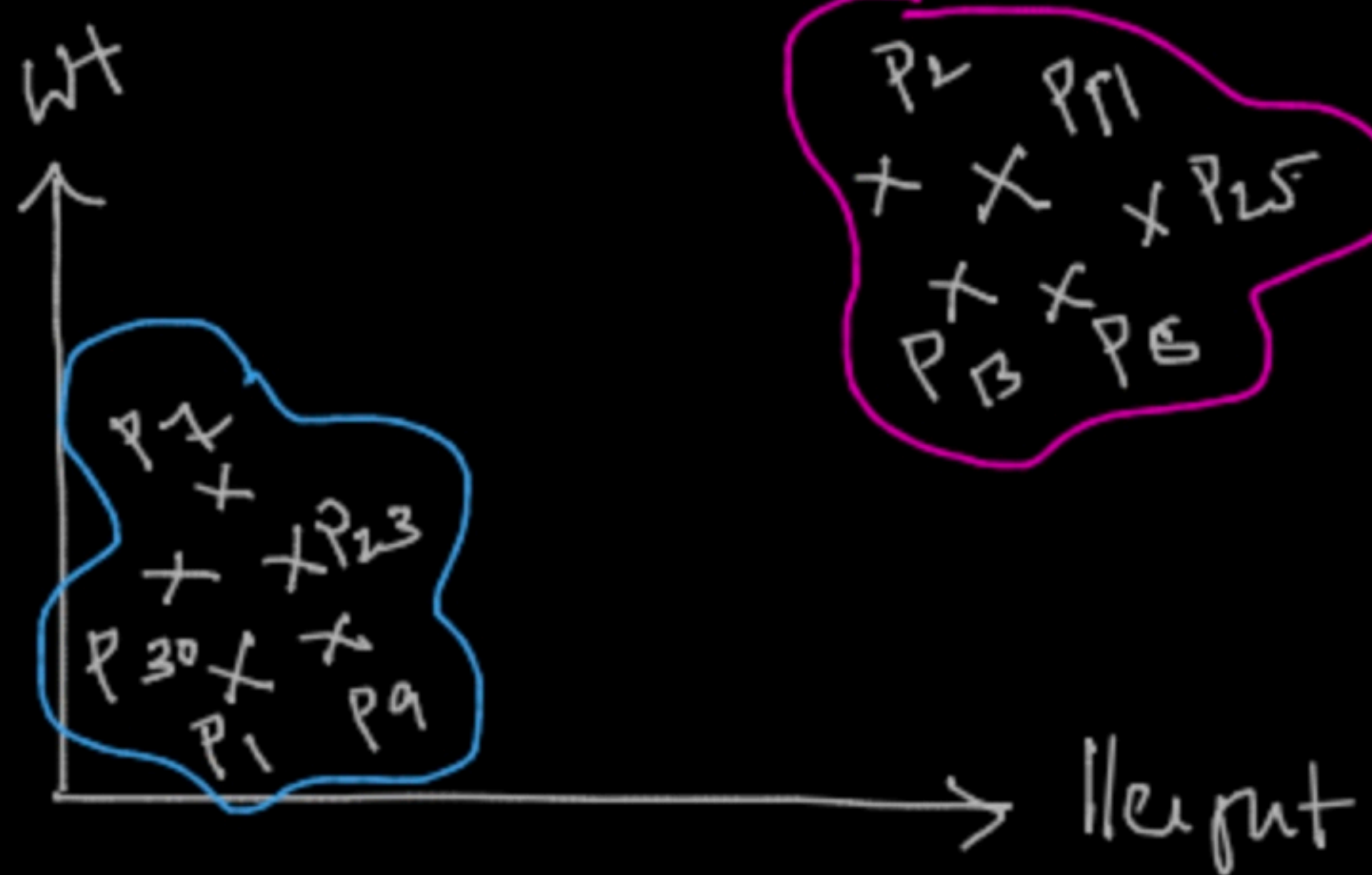
Sim

Age	Income	No. of visits	Bill amt

C₁

C₂

C₃

.

.

.

C₁₀,₀₀₀