Alexandre Marangoni Costa
alex.costa@loopapps.com

MACHINE LEARNING IS…

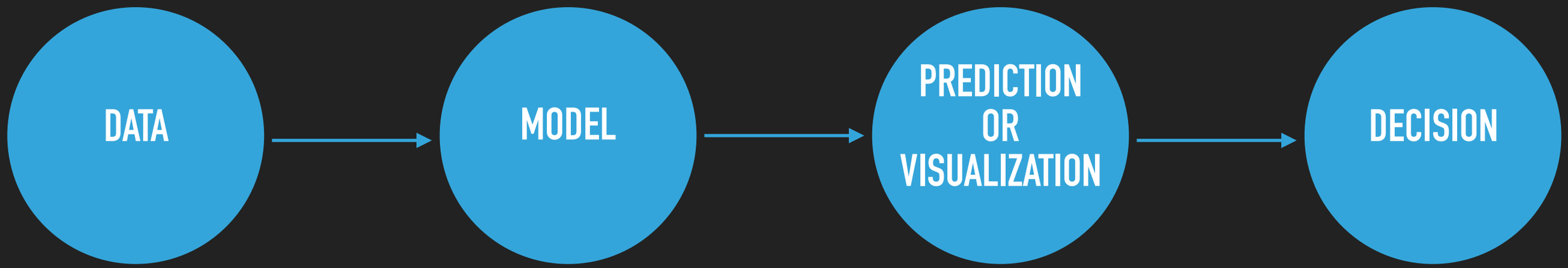
FINDING A FUNCTION

(THAT DESCRIBES YOUR DATA)

ARTHUR SAMUEL, 1958

"How can computers learn to solve problems without being explicitly programmed?

NOWADAYS



Excel
CSV
SQL
Amplitude

Just a file

Model output

Show video to user

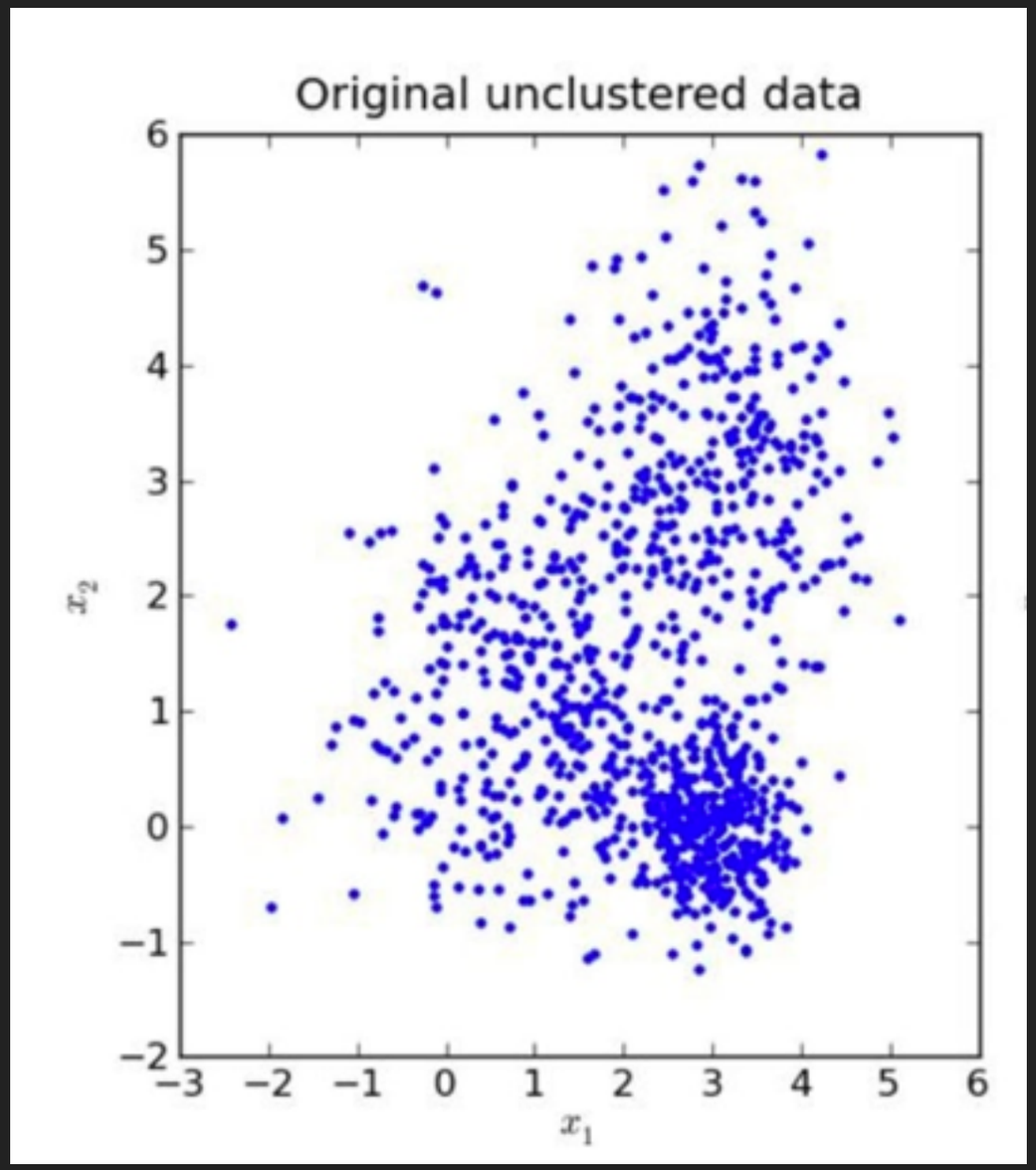
RECOMMENDATION SYSTEMS

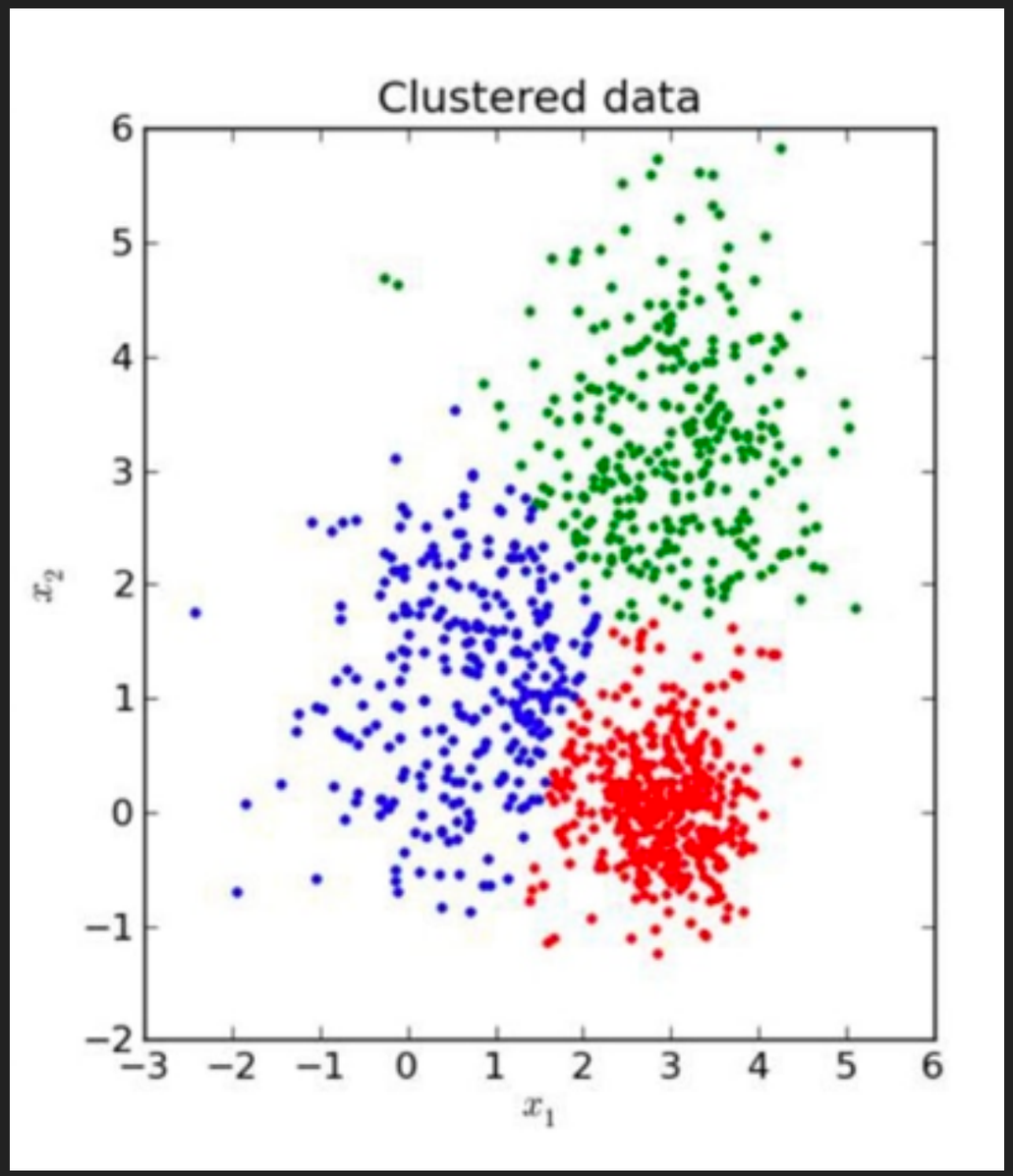
NSFW DETECTION

VOICE RECOGNITION

DATA VISUALIZATION AND ANALYSIS

MORE


Original unclustered data
6
5
4
3
2
1
0
−1
−2
x_2
−3
−2
−1
0
1
2
3
4
5
6
x_1


Clustered data
6
5
4
3
2
1
0
−1
−2
−3
−2
−1
0
1
2
3
4
5
6
x_1
x_2

Users	Age	Gender	Country	Watch video X Until the end
1	14	M	BR	1
2	36	F	US	0
3	25	M	AR	1
4	44	F	PL	0

Age

Gender

Country

Favorite Tag 1

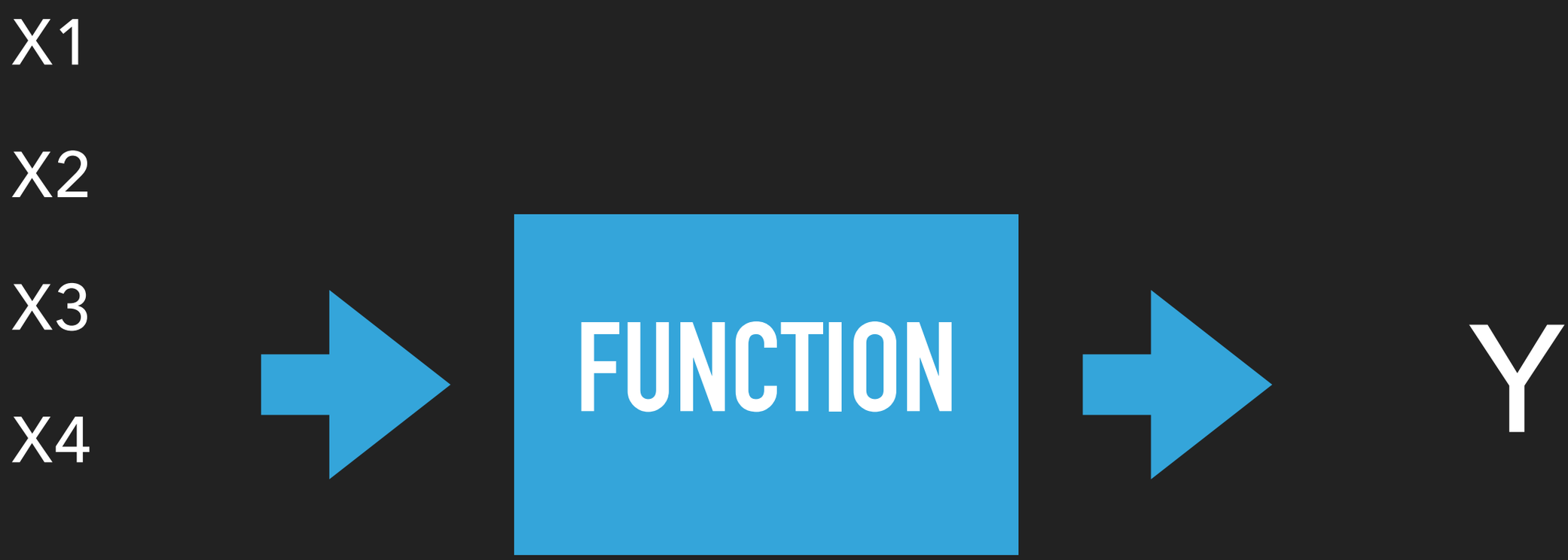
Favorite Tag 2

Most watched playlist

WATCH VIDEO X

Classification: (0 or 1)

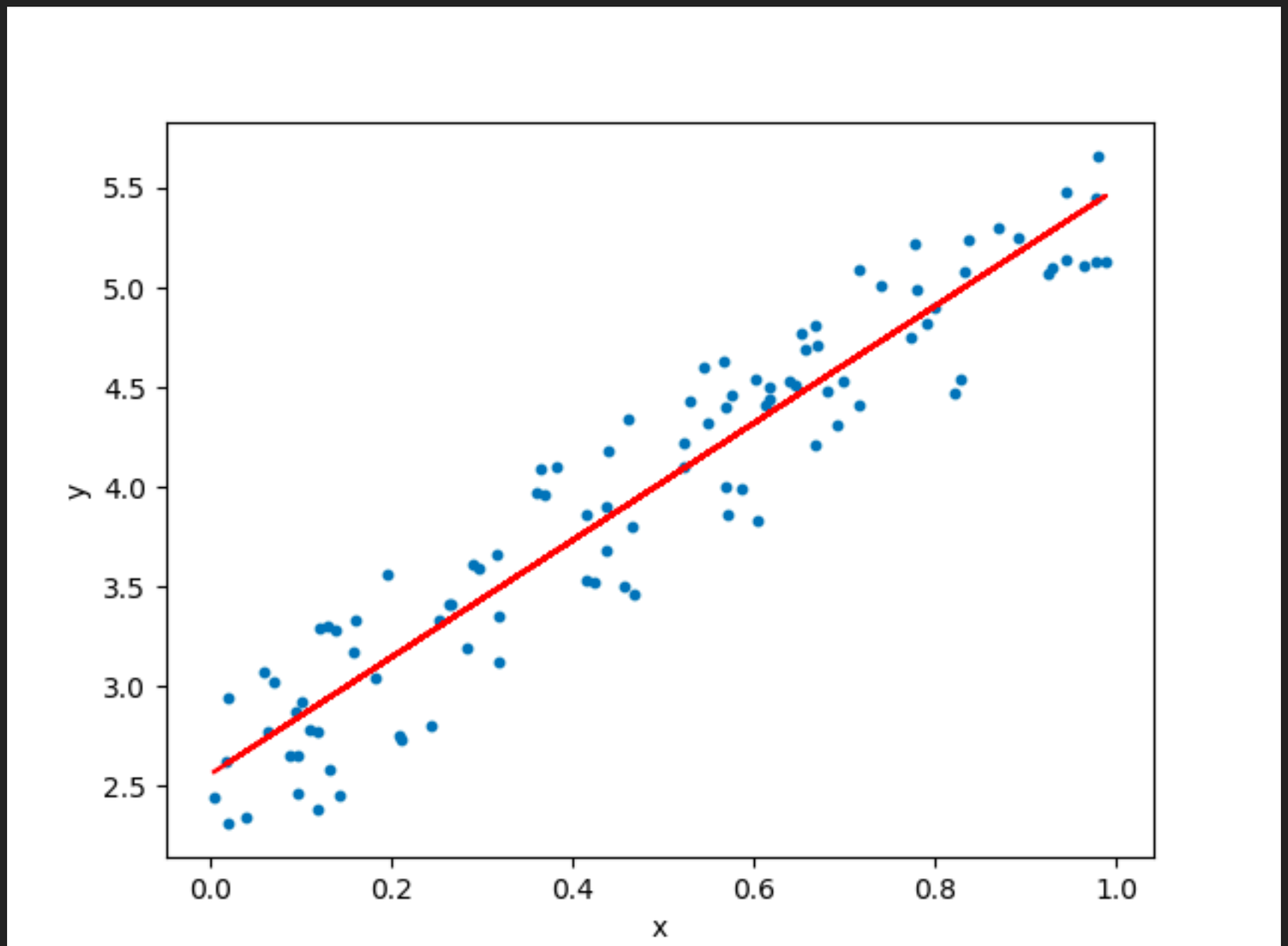
Prediction: 80%



$$f(x_1, x_2, x_3, x_4, \ldots, x_n) = y$$

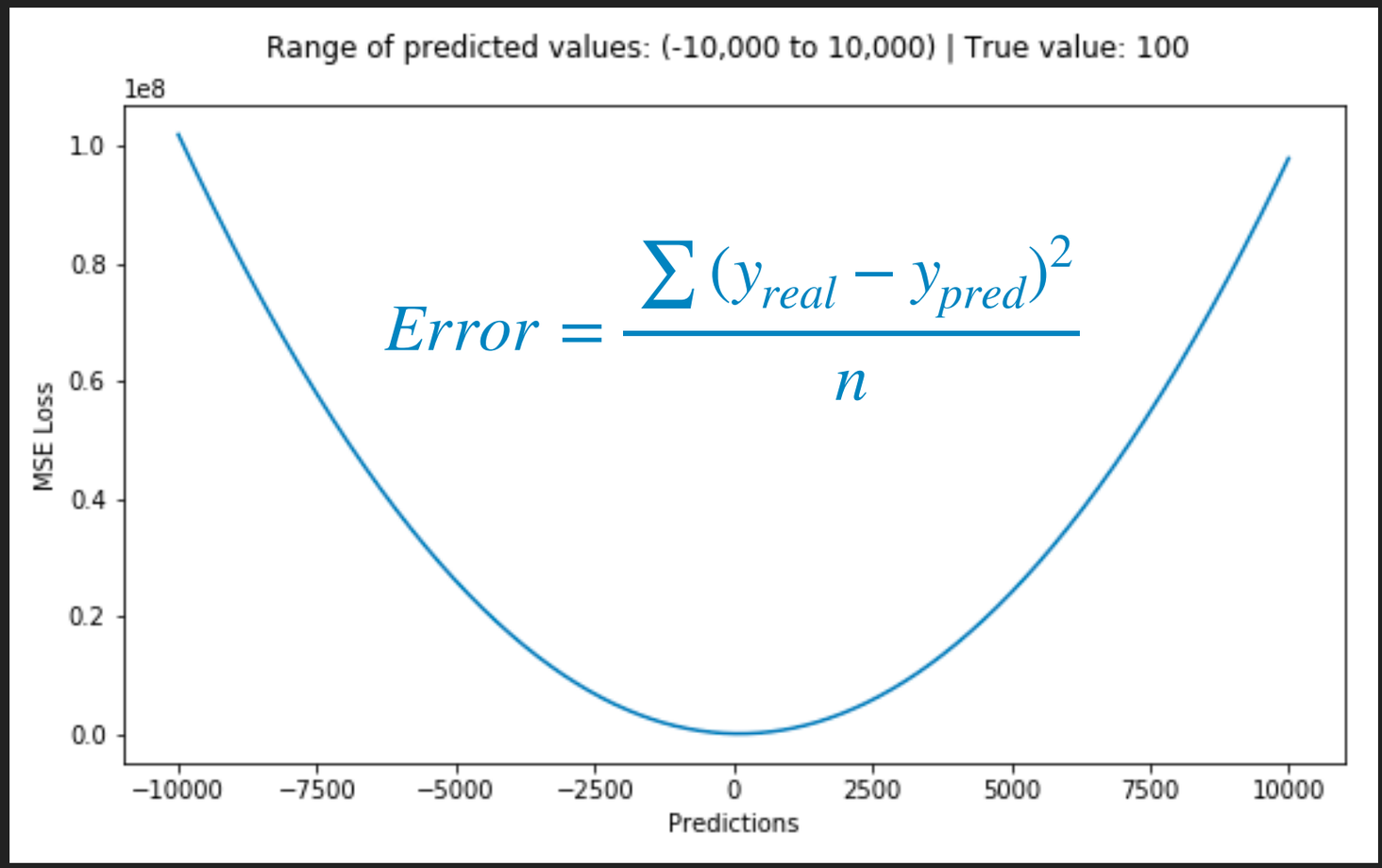
$$f(age, gender, country) = watchVideoUntilEnd$$

LINEAR REGRESSION



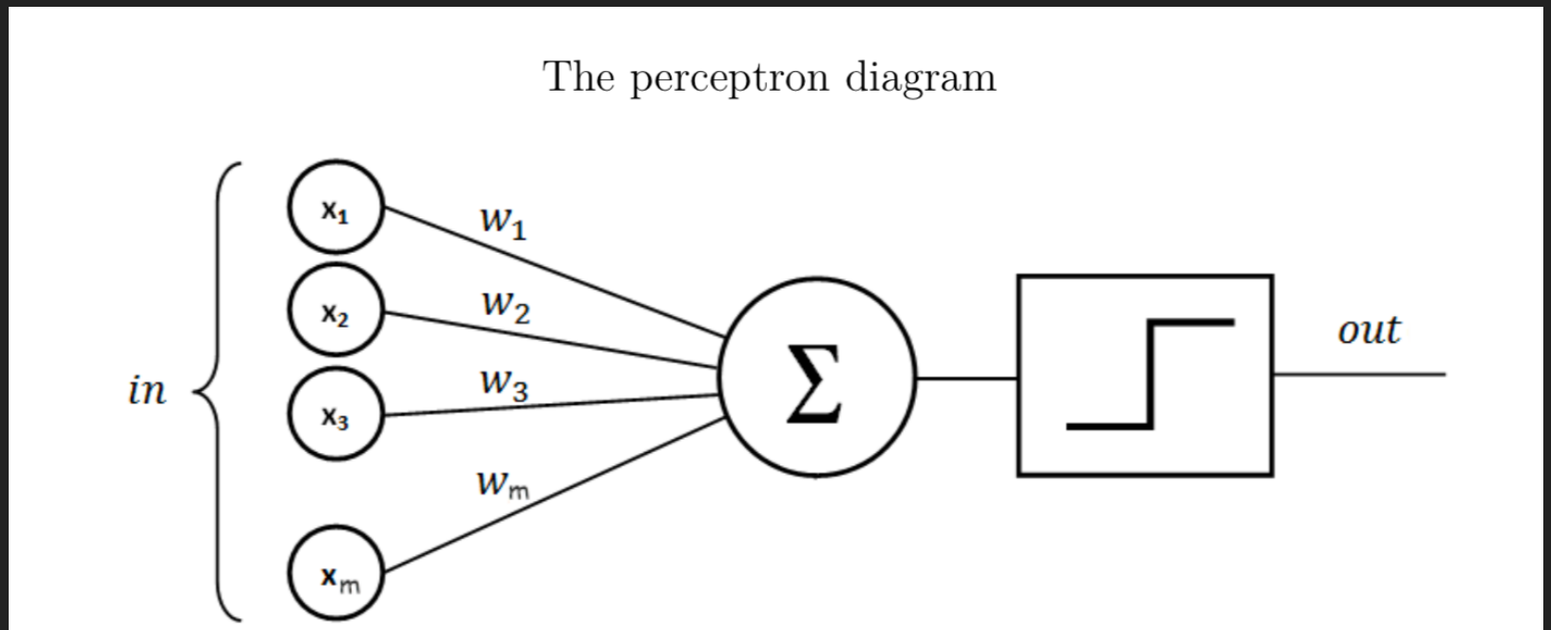
What is this function?

LINEAR REGRESSION – MINIMIZE ERROR



How to minimize the error?

ALMOST SAME THING BUT WITH W INSTEAD OF A!

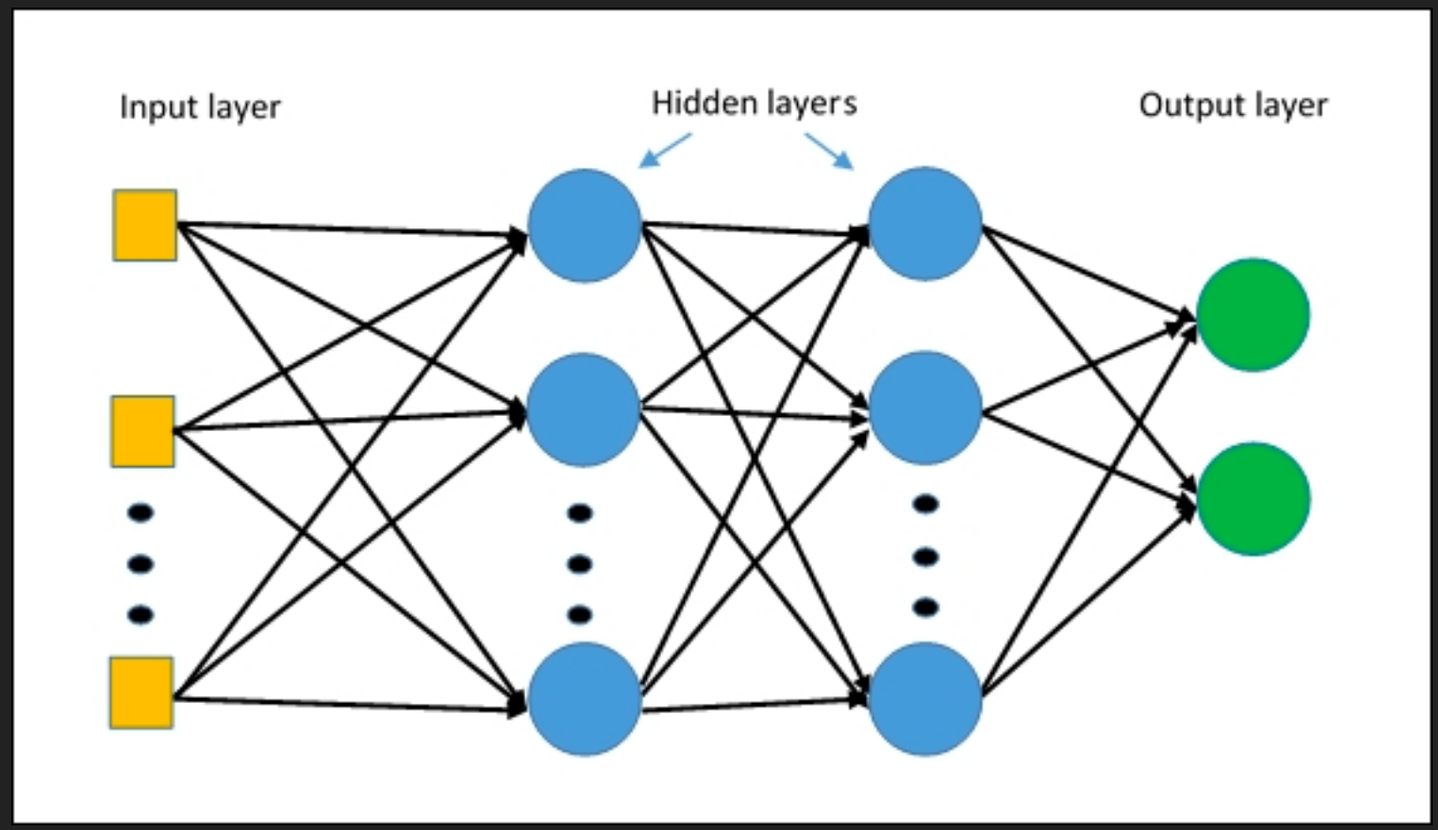


Mathematically, the perceptron is a function that maps the input $\boldsymbol{x}$ to a binary output $\boldsymbol{f(x)}$.

$$f(x) = \begin{cases} 1 & \text{if } \boldsymbol{w} \cdot \boldsymbol{x} + b > 0 \\ 0 & \text{otherwise} \end{cases}$$

$\boldsymbol{w} \cdot \boldsymbol{x}$ is the dot product $\sum_{i=1}^{m} w_i x_i$,
w is a vector of weights
m is the number of inputs
b is the bias

CAN HAVE MULTIPLE LAYERS



EXERCISE

THANK YOU!

QUESTIONS?