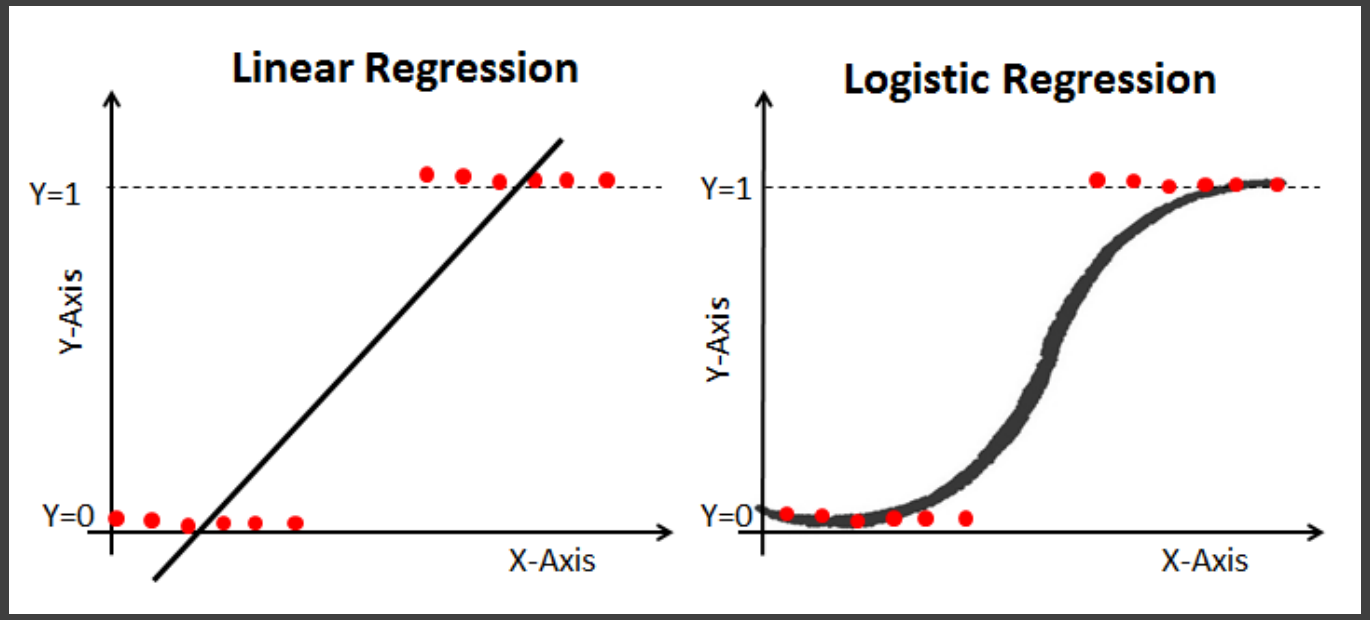
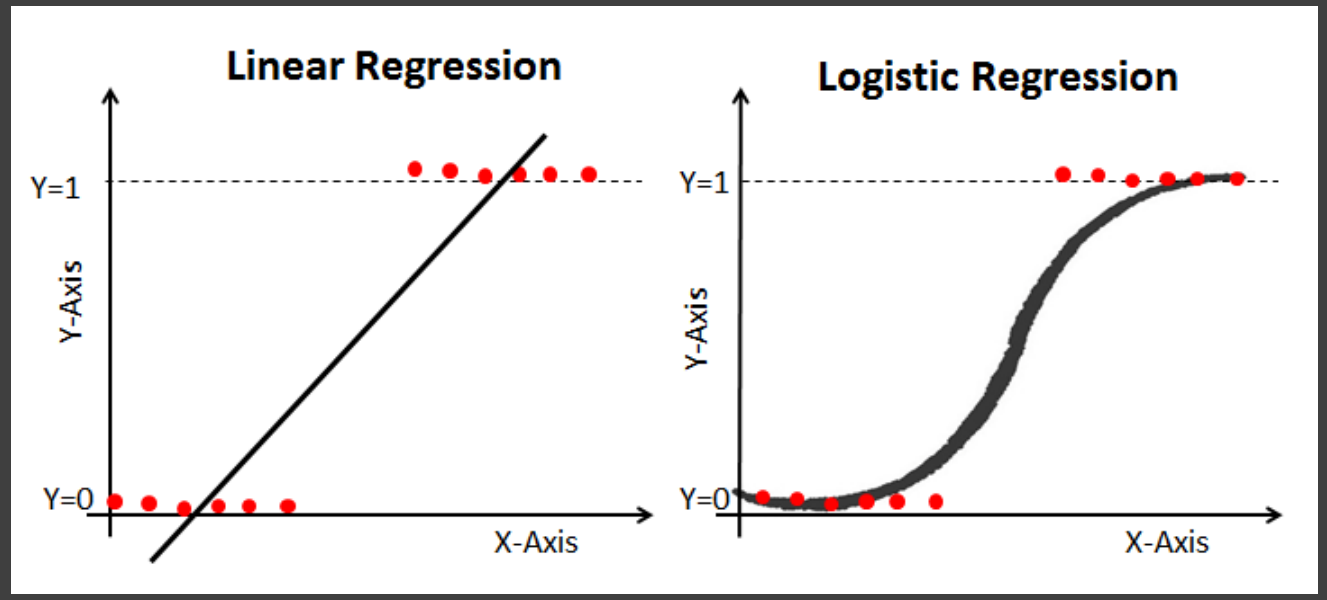
Lecture 8

Logistic Regression

La Regression Logistique



Outlines



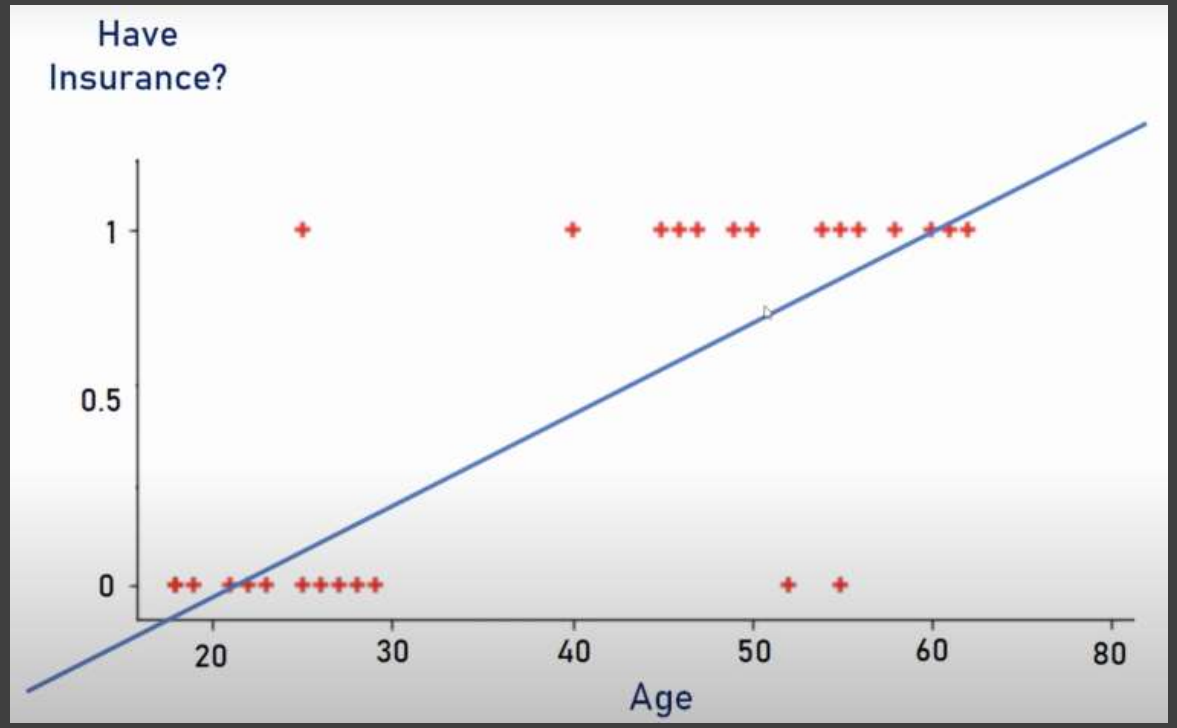
1. Qu'est-ce qu'une régression logistique ?
2. pourquoi utiliser la régression logistique?
3. Conversion de la régression linéaire en régression logistique.
4. Practice(Coding on Anaconda)

Qu'est-ce qu'une régression logistique ?

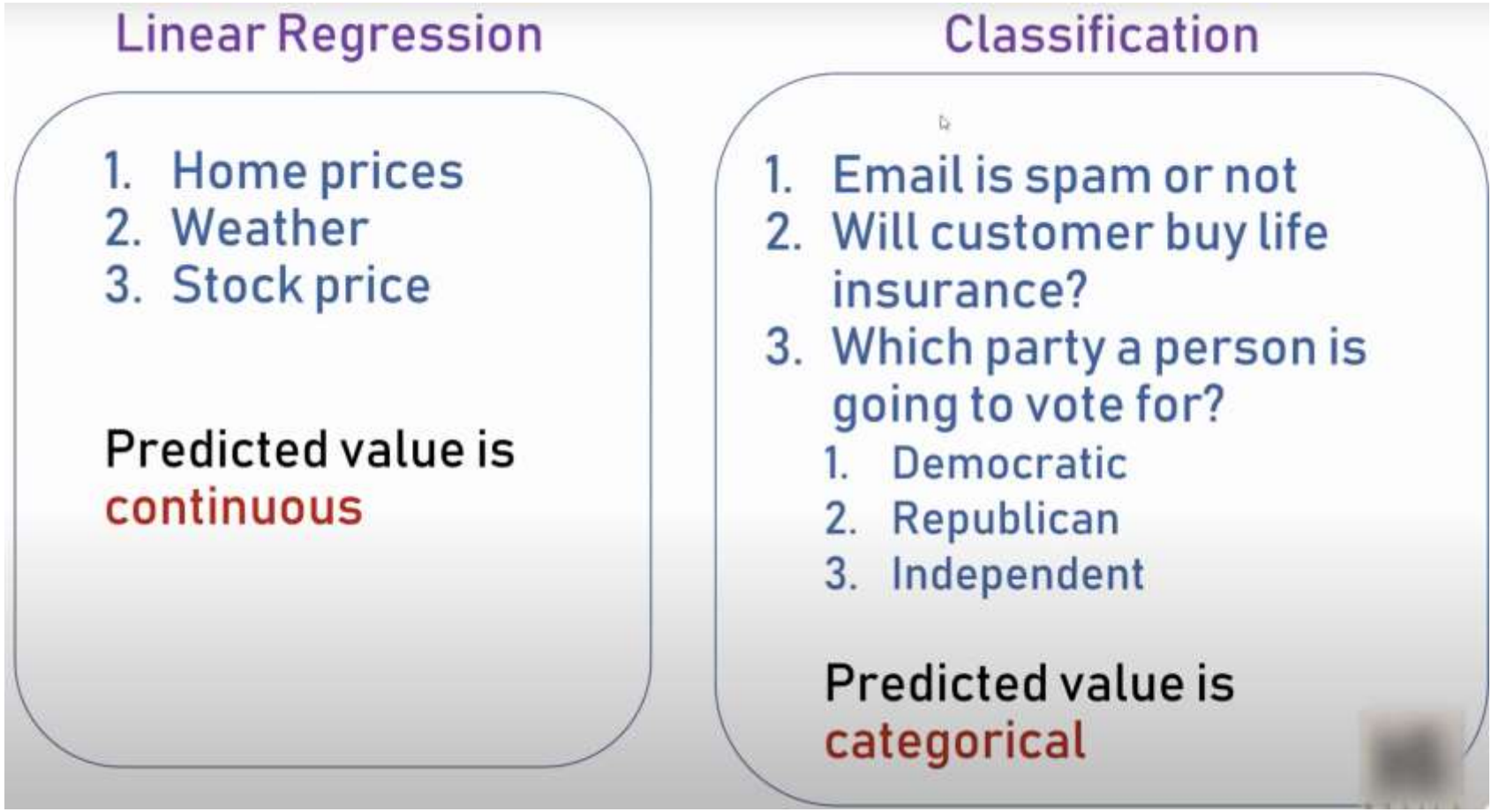
Definition:

La régression logistique est une transformation de régression linéaire utilisant la fonction **sigmoïde**. L'axe vertical représente la probabilité pour une classification donnée et l'axe horizontal est la valeur de x.

Logistic Regression is a transformation of a linear regression using the sigmoid function. The vertical axis stands for the probability for a given classification and the horizontal axis is the value of *x*.



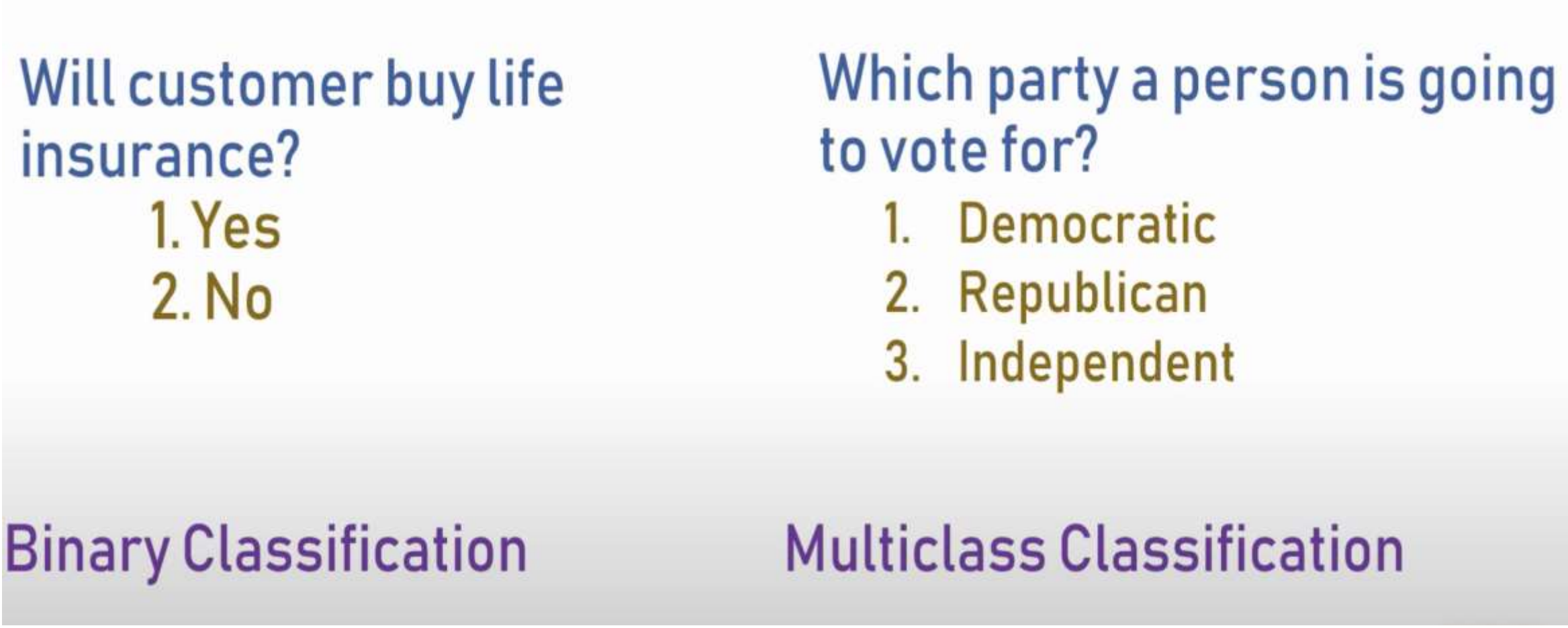
Exemple…



Note:Régression logistique est l'une des techniques utilisées pour résoudre un problème de **classification**

A logistic regression is one the techniques used to solve a **classification** problems

Types de classification/Classification Types



Example…

Supposons que vous travaillez en tant que data scientist dans une compagnie d'assurance-vie et que votre patron vous a confié la tâche de prédire la probabilité qu'un client potentiel achète votre produit.

Let us say that you are working as a data scientist in a life insurance company and your boss gave you a task to predict how likely a potential costamer is to buy your product.

Dataset

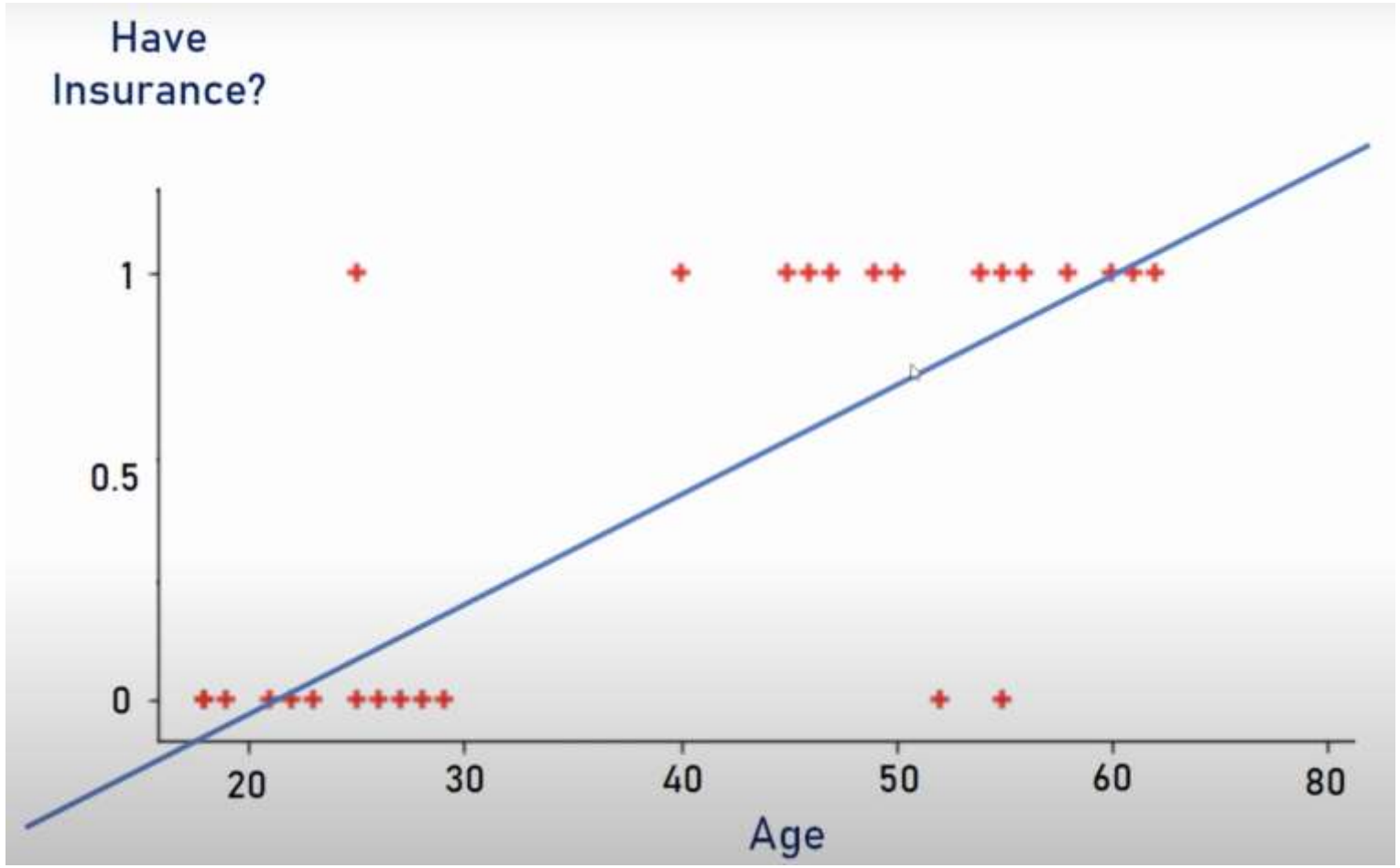
age	have_insurance
22	0
25	0
47	1
52	0
46	1
56	1
55	0
60	1
62	1
61	1
18	0
28	0
27	0
29	0
49	1

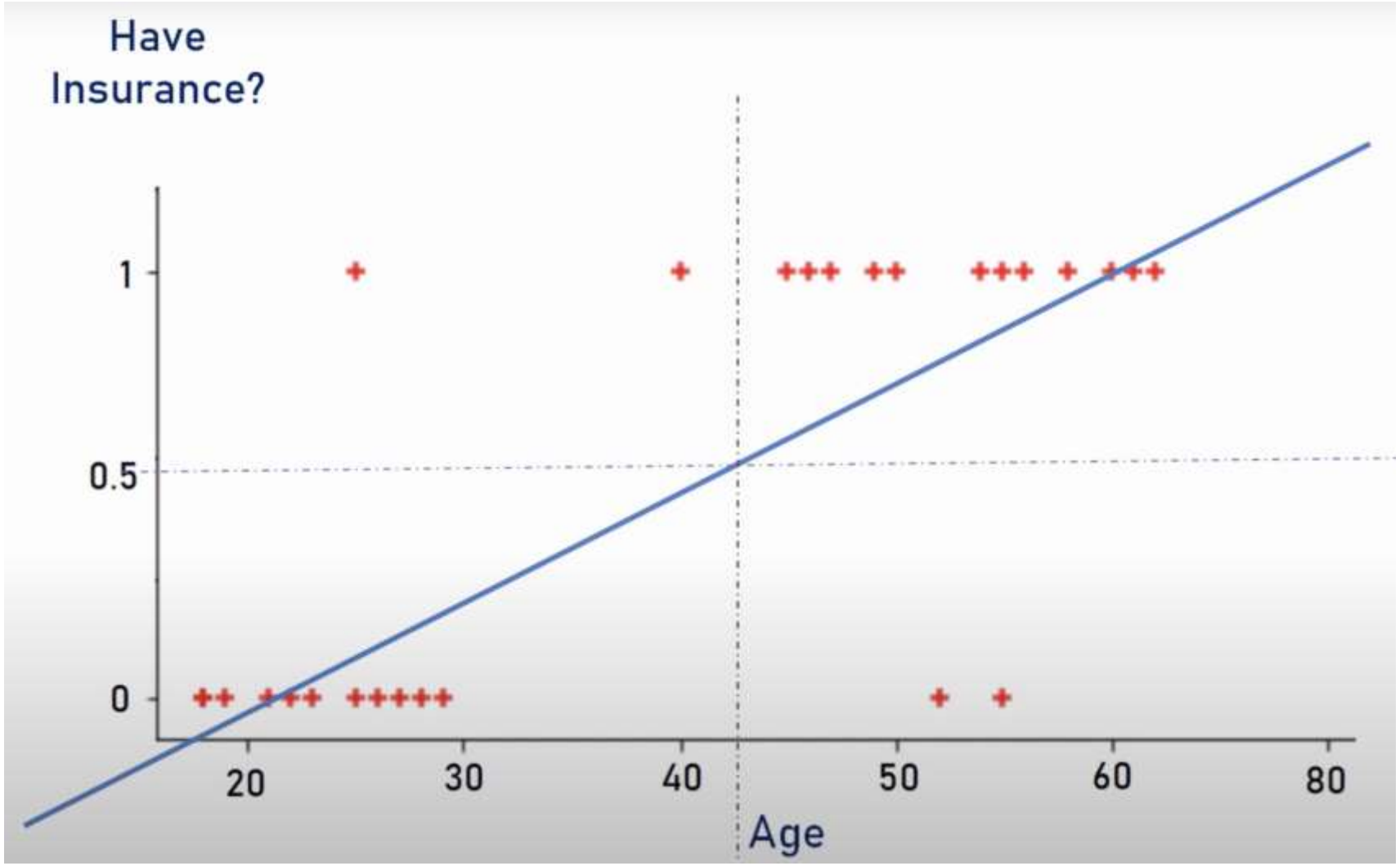
Supposons que vous travaillez en tant que data scientist dans une compagnie d'assurance-vie et que votre patron vous a confié la tâche de prédire la probabilité qu'un client potentiel achète votre produit.

Construire un modèle de machine learning pour prédire le client potentiel susceptible d'acheter votre produit

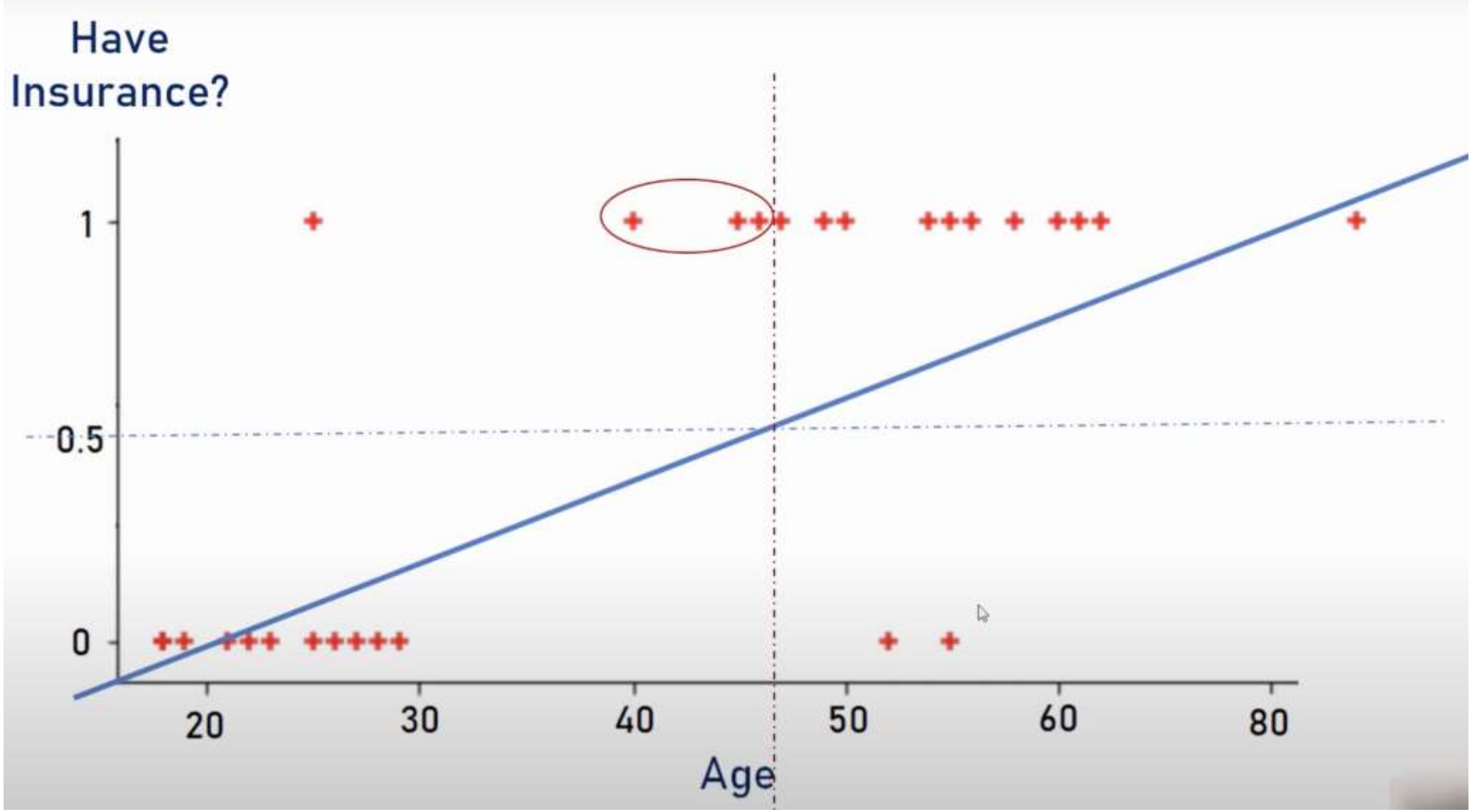
To build a machine learning model to predict the potential customer likely to buy your product

using Linear Regression



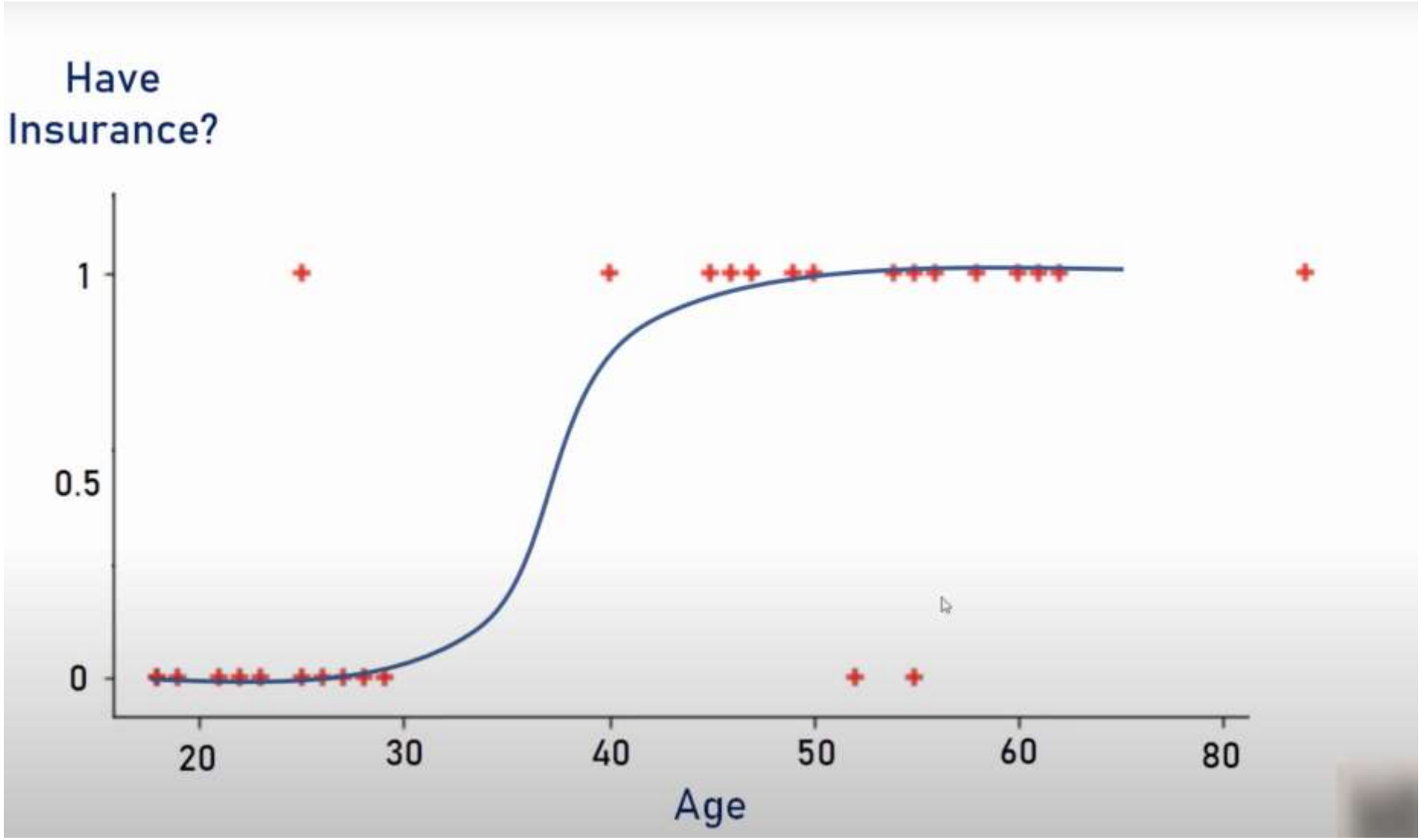


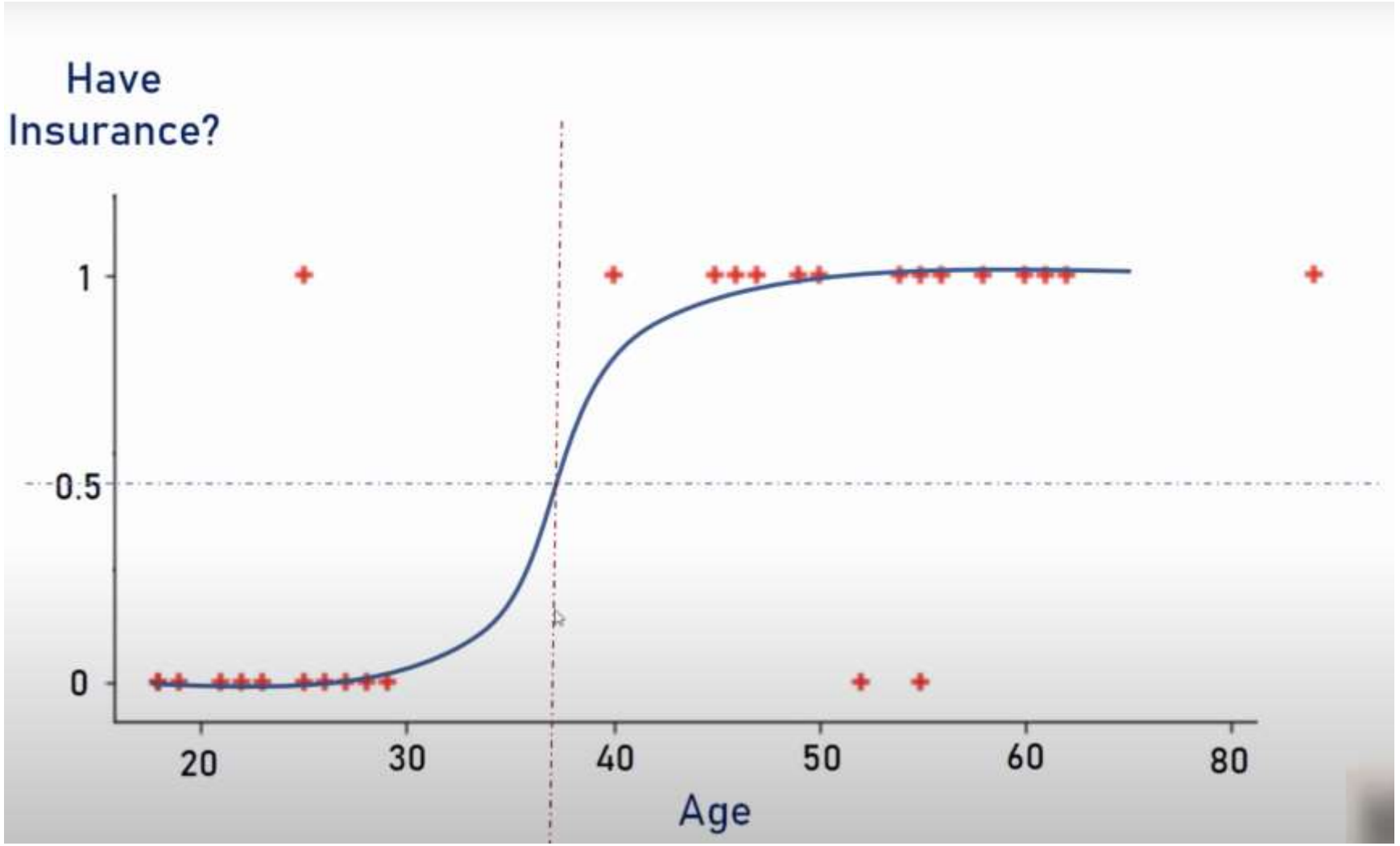
NB: Imagine that someone his is 90 and baught a life insurance that will cause a problem in our graph



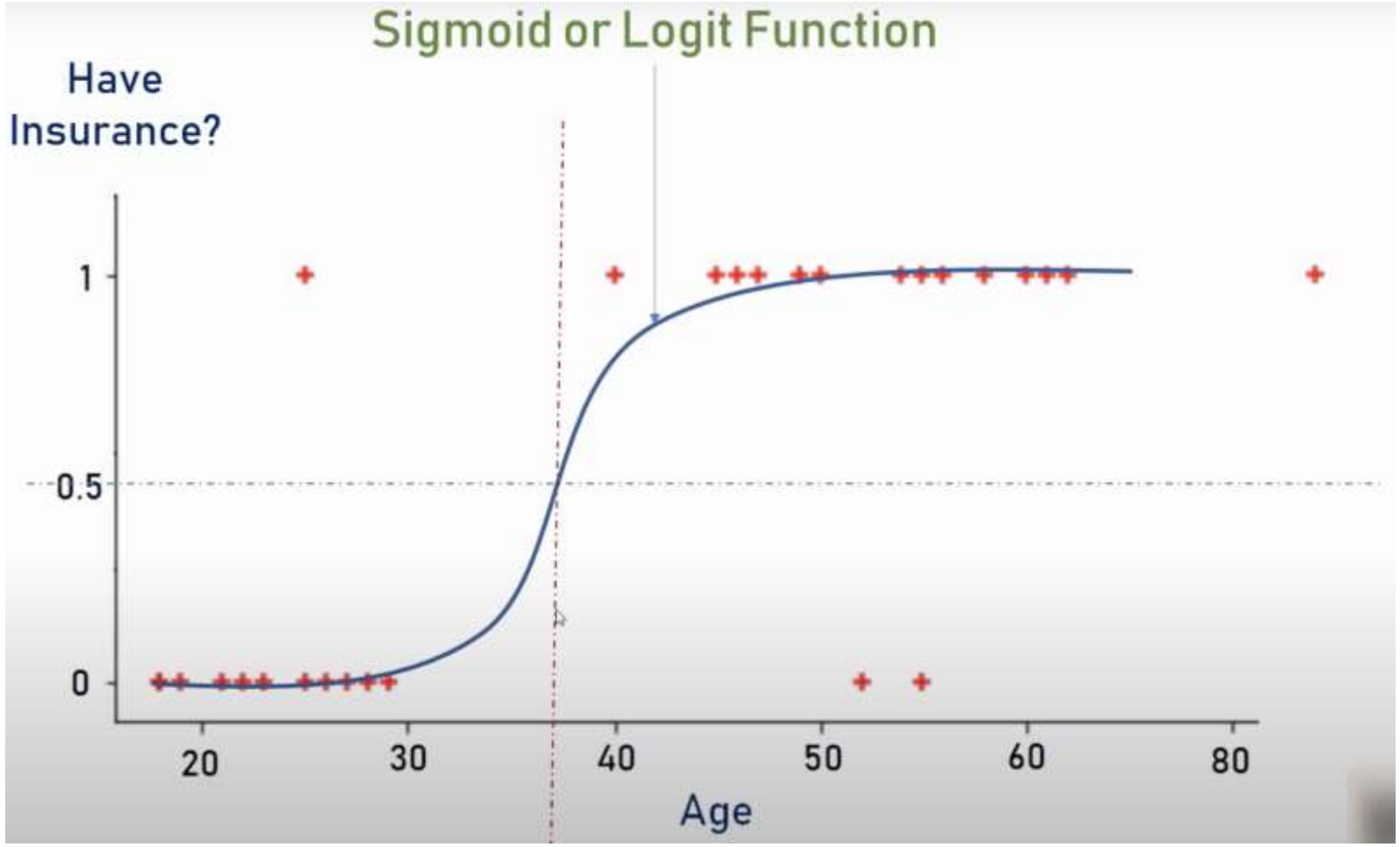
The answer yes but is no…this is because the linear regression fit for such problem

Imagine we draw a line like this and that could be better fit compare linear regression line thar we draw earlier.

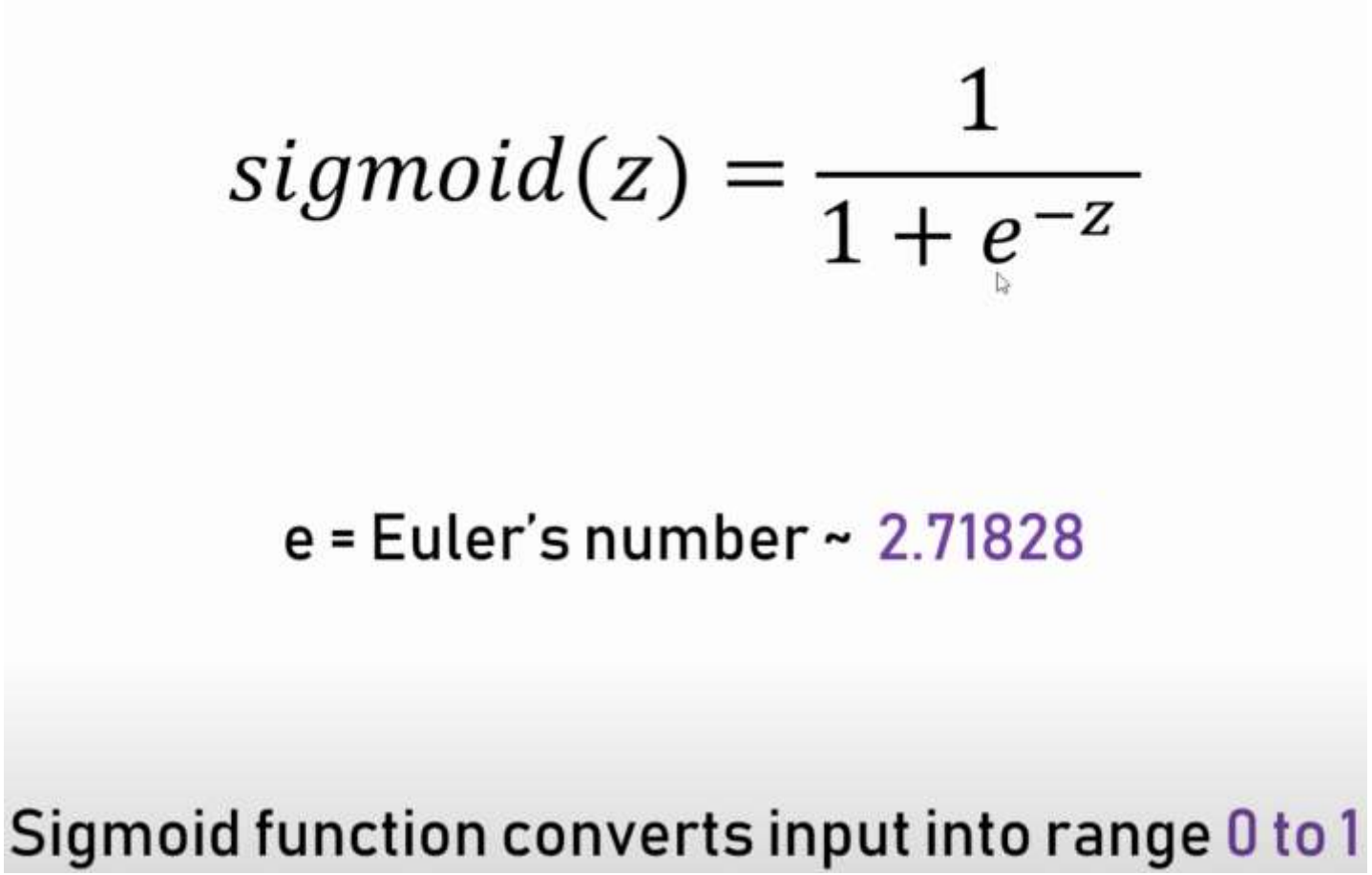



Have
Insurance?
1
0.5
0
20
30
40
50
60
80
Age

Sigmoid or Lgit Function



Equation of Sigmoid/ Équation du sigmoïde



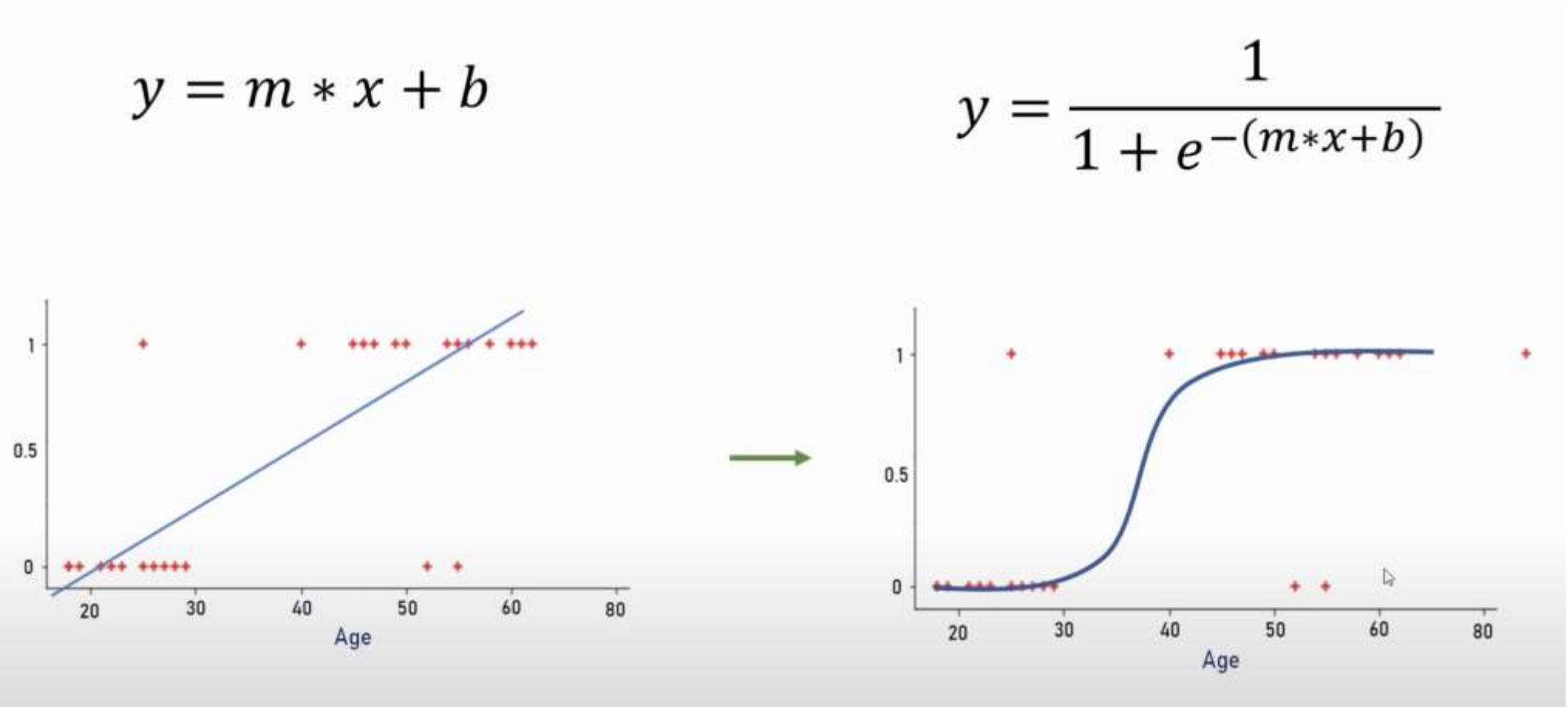
NB: Nous sommes entrain de diviser 1 par un nombre légèrement supérieur à 1

We are dividing 1 by number which is slightly greater than 1 and the out will be number that smaller than 1 right?

Converting Linear regression to Logistic Regression.

$$y = m * x + b$$

$$y = \frac{1}{1 + e^{-(m*x+b)}}$$



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Practice...