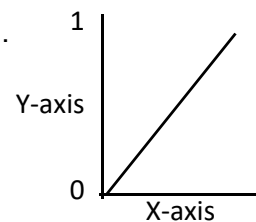# Logistic Regression

A set of independent variables estimates discrete values (often binary values like 0/1) using logistic regression. Fitting data to a logistic regression function helps predict an event's probability. For example, logistic regression can be used to predict whether a political candidate will win or lose and whether or not a secondary school student would be admitted to a given secondary school.

It produces results in binary format which is used to predict the outcome of categorical dependent variable outcome should be discrete /continues means 0 or 1, True or False, Low or High, Yes or No.
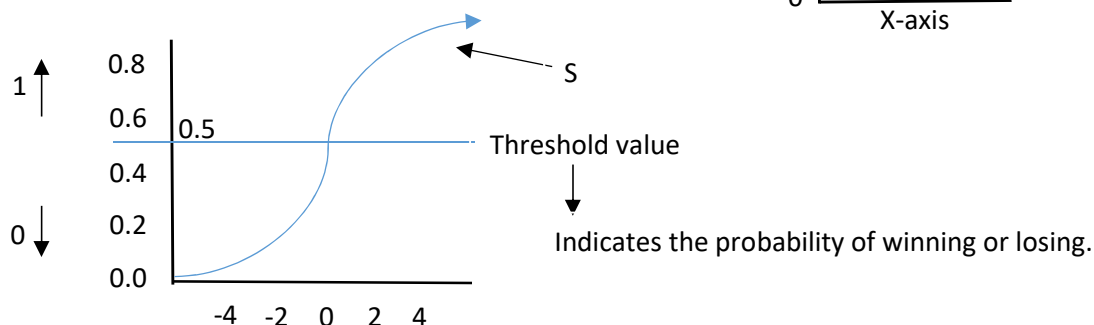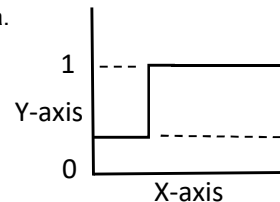
Linear ⟶ Y in range

Y will be b/w 0 and 1 the linear line has be clipped at 0 & 1.

With this our resulting curve cannot be formulated into a single formula.

Logistic ⟶ the sigmoid "S" curve.

S

Threshold value

↓

Indicates the probability of winning or losing.

The logistic regression equation is derived from straight line equation.

Straight line ⟶ Y = C + B1X1 + B2X2 + …   (Range is from infinity to infinity)

Logistic R from straight line ⟶ Y = C + B1X1 + B2X2 + … (Y can only from 0 to 1)

Range of Y b/w 0 and infinity (transform Y)

$\dfrac{Y}{1-Y}$ ⟩ Y = 0 then 0
Y = 1 then infinity

$\text{Log}\left[\dfrac{Y}{1-Y}\right]$ ⟶ Y = C + B1X1 + B2X2 + ….