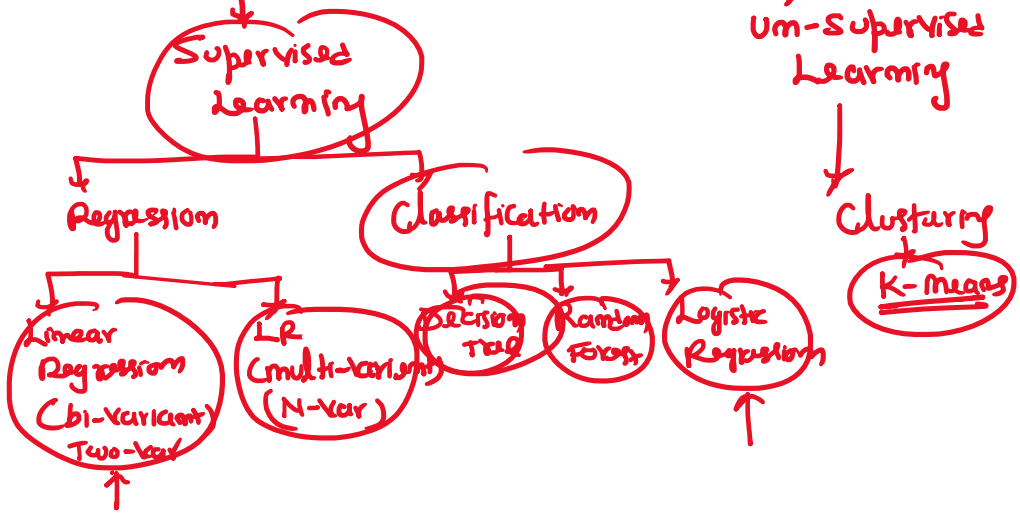
08 January 2025 21:09

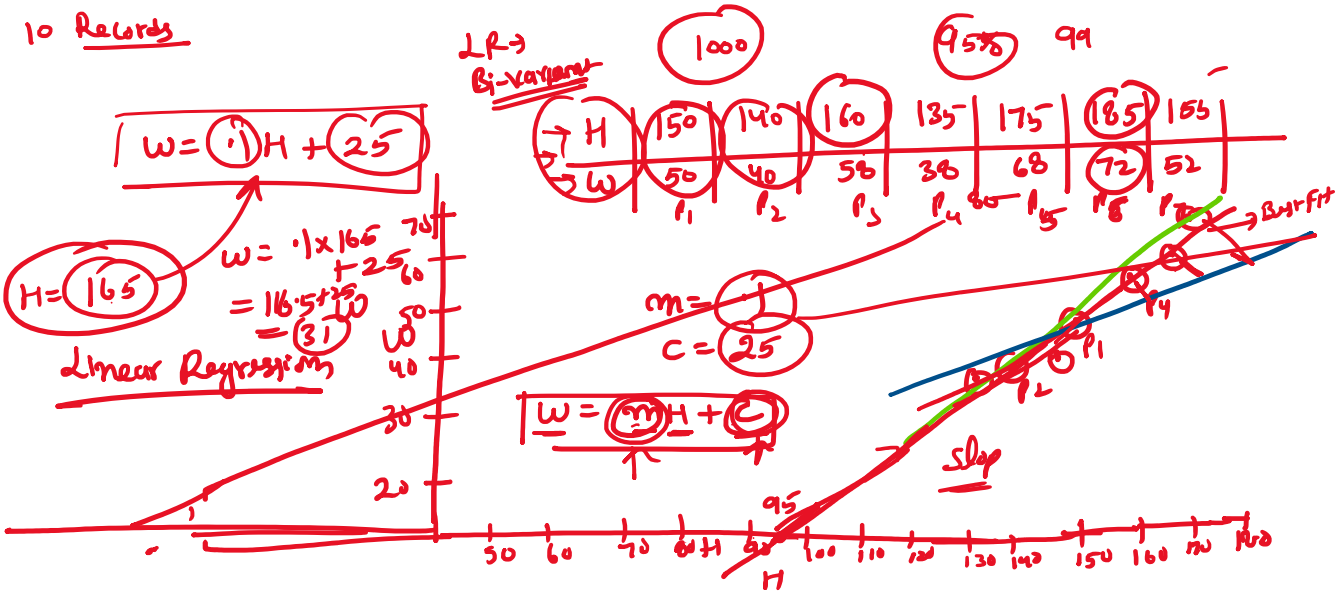
Day-2

ML - Algorithms



Linear Regression

10 Records



$y = a_1x_1 + a_2x_2 + a_3$

$m = .727$

$C = -61.28$

$W = .727 \times 165 - 61.25$

$= 59$

$W = .727 * H - 61.28$

$W = .727 \times 160 - 61.28 = 56$

$W = .727 \times 185 - 61.28 = 73$

LR (Multi-Variant)

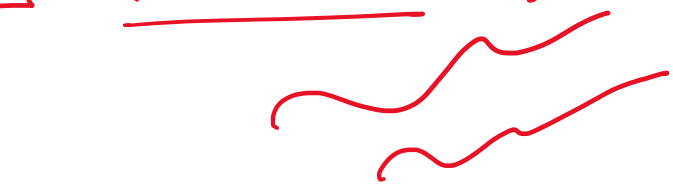
$y = a_1x_1 + a_2x_2 + a_3x_3 + c$

$$Y = (1)x_1 + (125)x_2 + (32)x_3 - (10)$$
a_1 a_2 a_2 c

$y = ax + c$

$ax_1' + bx_2' + cx_3' + d$ → Linear

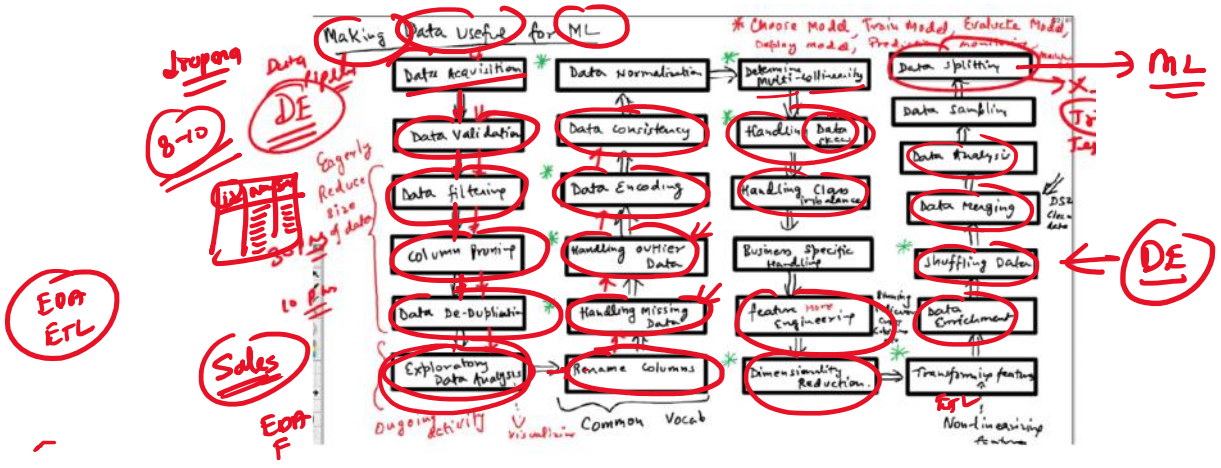
$ax^2 + bx + c$ → Curve



$$\text{Price} = m * \text{area} + c$$

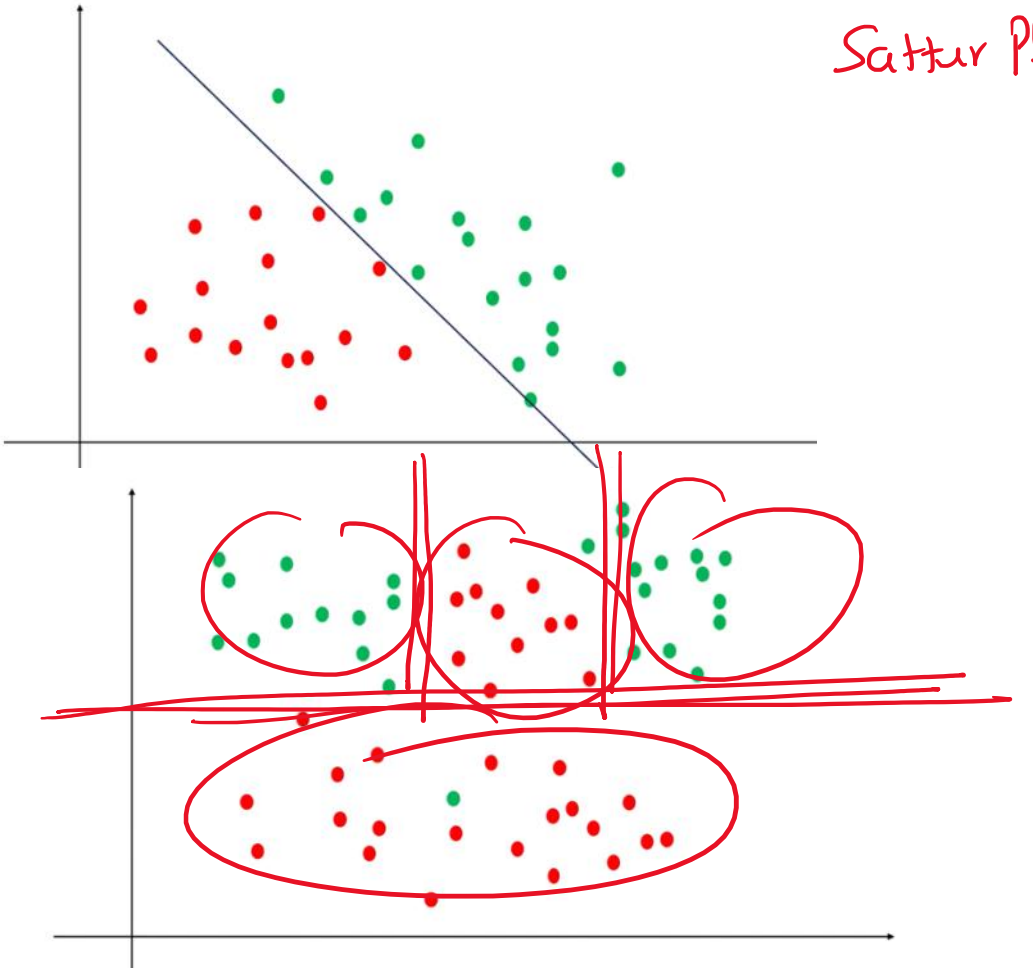
$$\text{Price} = 135.787 * \text{area} + 180616.43$$

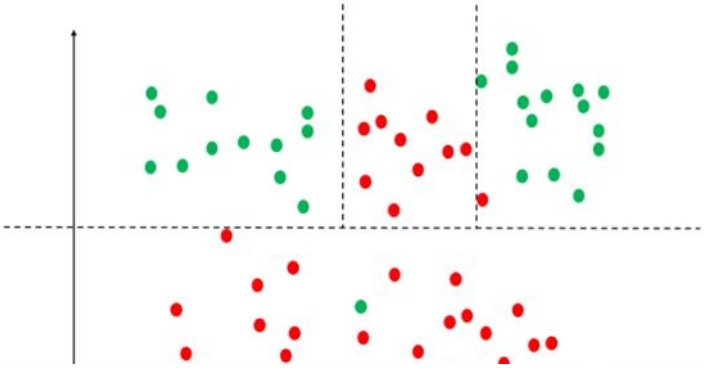
$$= 135.787 \times 3200 + 180616.43$$



Decision Tree (Classification)

Scatter Plot

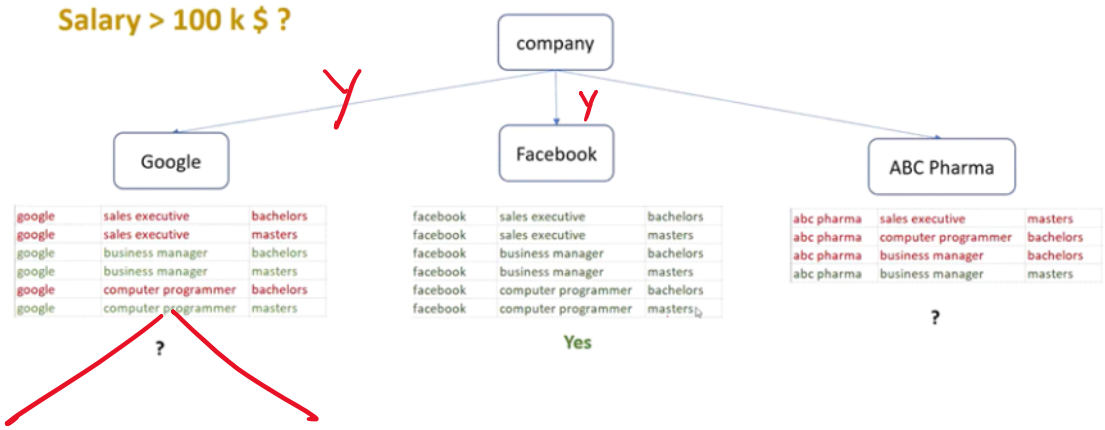


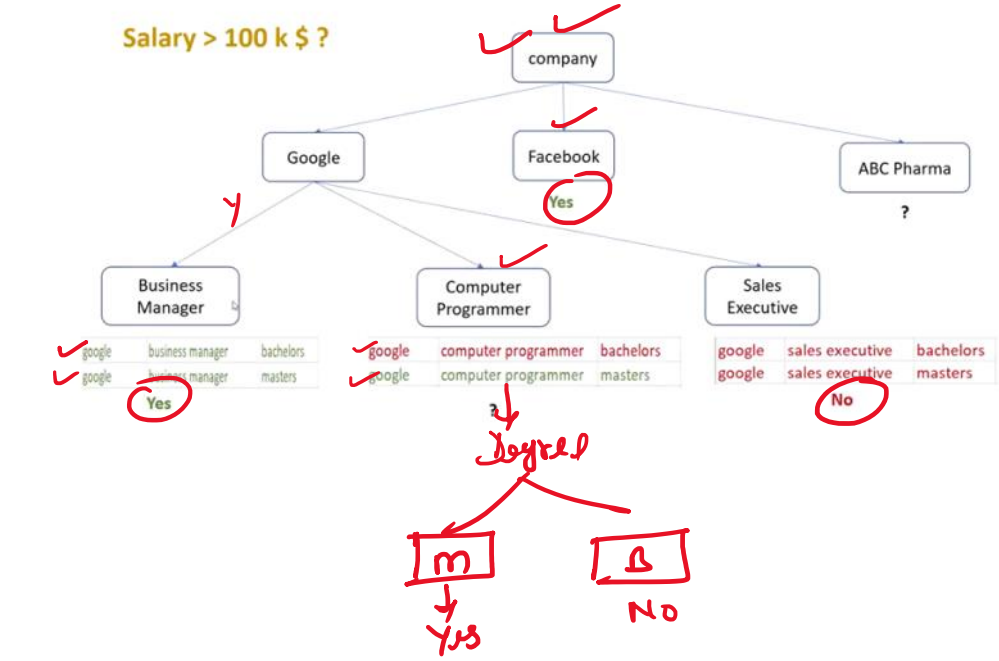


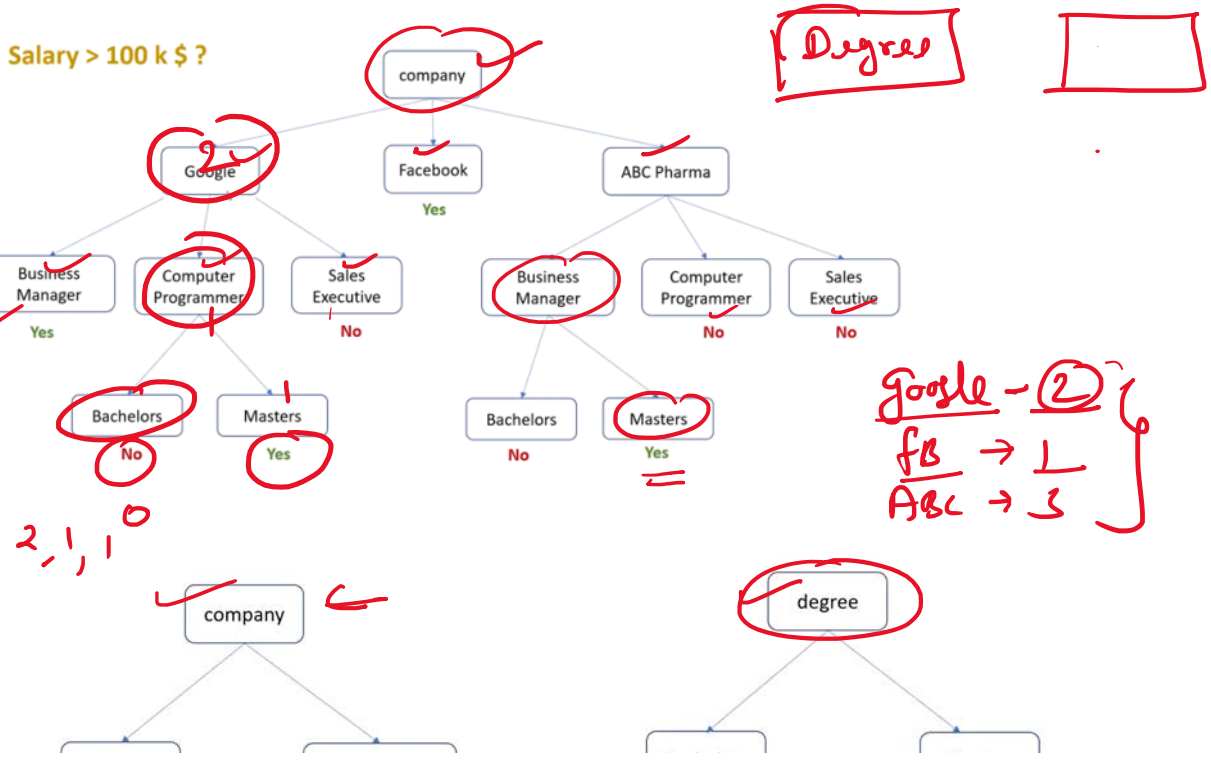
Company	Job	Degree	Salary_more_then_100k
google	sales executive	bachelors	0
google	sales executive	masters	0
google	business manager	bachelors	1
google	business manager	masters	1
google	computer programmer	bachelors	0
google	computer programmer	masters	1
abc pharma	sales executive	masters	0
abc pharma	computer programmer	bachelors	0
abc pharma	business manager	bachelors	0
abc pharma	business manager	masters	1
facebook	sales executive	bachelors	1
facebook	sales executive	masters	1
facebook	business manager	bachelors	1
facebook	business manager	masters	1
facebook	computer programmer	bachelors	1
facebook	computer programmer	masters	1

100 K USD

LR


Salary > 100 k $?
company
Google
Facebook
ABC Pharma
google sales executive bachelors
google sales executive masters
google business manager bachelors
google business manager masters
google computer programmer bachelors
google computer programmer masters
facebook sales executive bachelors
facebook sales executive masters
facebook business manager bachelors
facebook business manager masters
facebook computer programmer bachelors
facebook computer programmer masters
abc pharma sales executive masters
abc pharma computer programmer bachelors
abc pharma business manager bachelors
abc pharma business manager masters
?
Yes
?


Salary > 100 k $?
company
Google
Facebook
ABC Pharma
Yes
?
Business Manager
Computer Programmer
Sales Executive
google business manager bachelors
google business manager masters
Yes
google computer programmer bachelors
google computer programmer masters
google sales executive bachelors
google sales executive masters
No
Degree
m
B
Yes
No


Salary > 100 k $?
company
Degree
Google
Facebook
ABC Pharma
Yes
Business Manager
Computer Programmer
Sales Executive
Yes
No
No
No
Bachelors
Masters
Bachelors
Masters
No
Yes
No
Yes
Google - 2
FB → 1
ABC → 3
2, 1, 1, 0
company
degree

High Information Gain

Low Information Gain

Company
0 → ABC
1 → FB
2 → Google

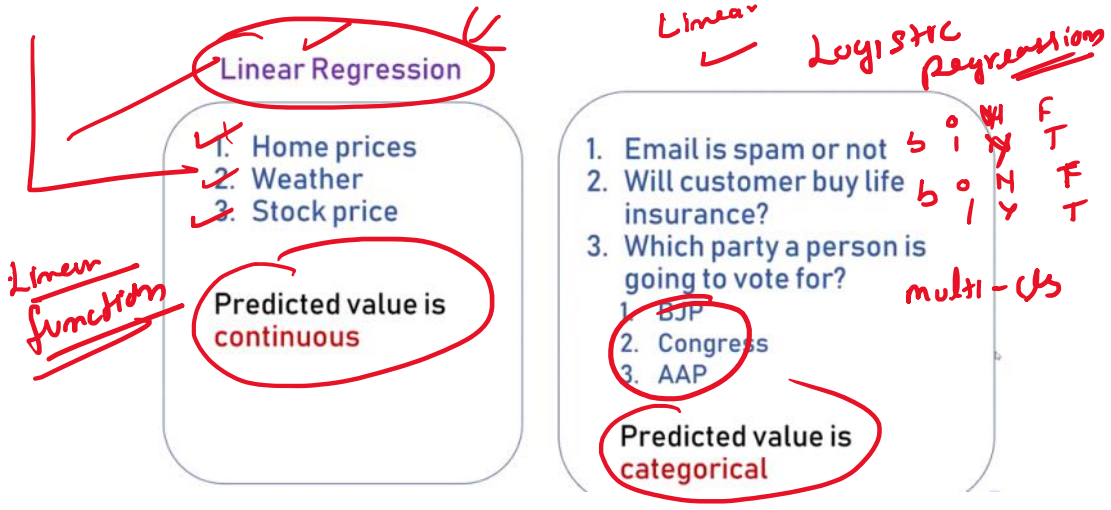
Job
0 → BM
1 → CP
2 → SE

degree
0 → B
1 → M

2, 1, 0

g, cp, B

look



Classification Types

Will customer buy life insurance?
1. Yes
2. No

Binary Classification

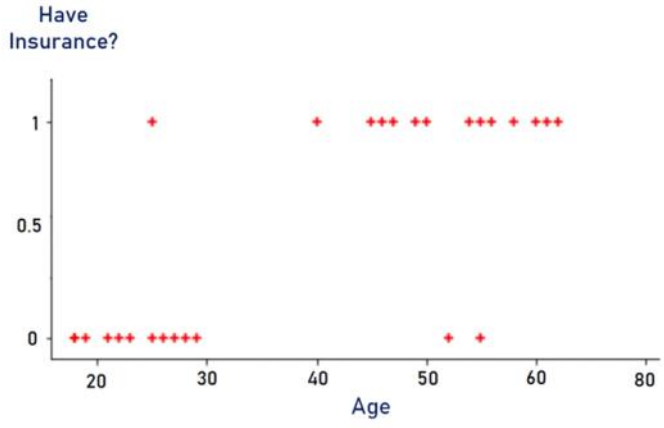
Which party a person is going to vote for?
1. BJP
2. Congress
3. AAP

Multiclass Classification

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

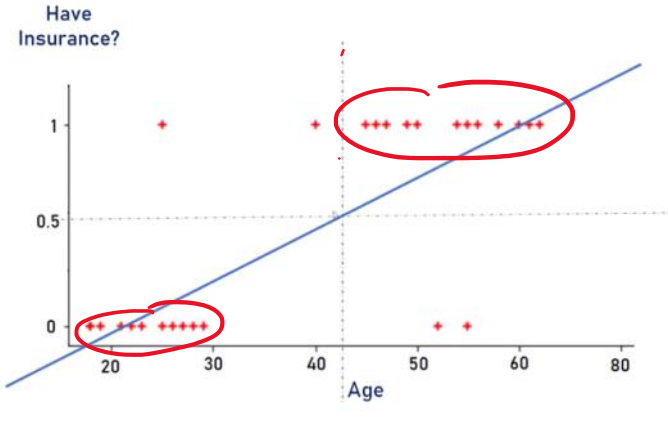
XYZ Insurance Company

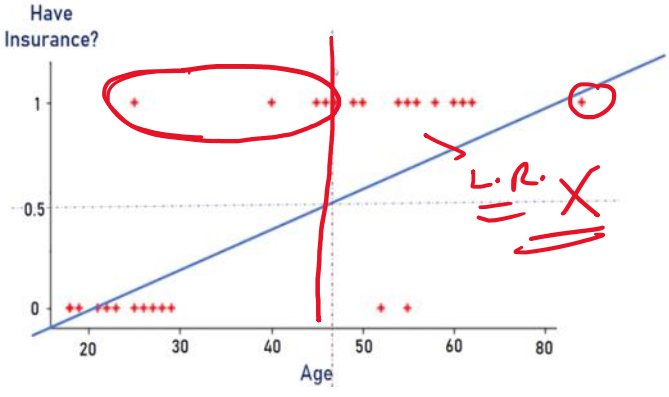
27



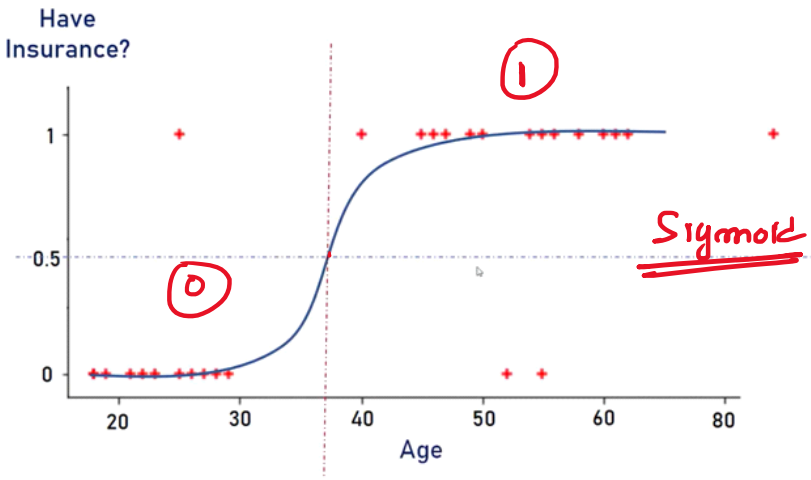
age	have_insurance
22	0
25	0
47	1
52	0
46	1
56	1
55	0
60	1
62	1
61	1
18	0
28	0
27	0
29	0
49	1

90 1



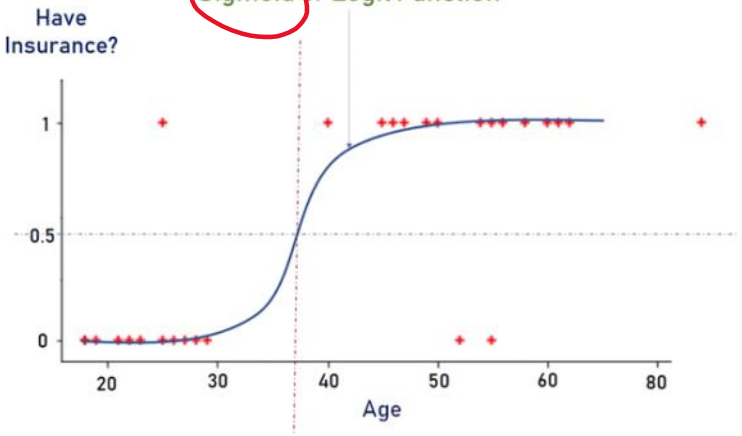


$y = mx + c$



Sigmoid

Sigmoid or Logit Function

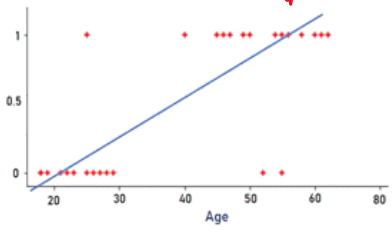


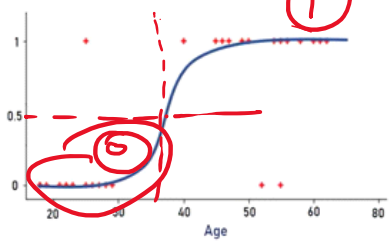
Linear Regression

$$y = m * x + b$$

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

Logistic Regression





$< .5 = 0$

$> .5 = 1$