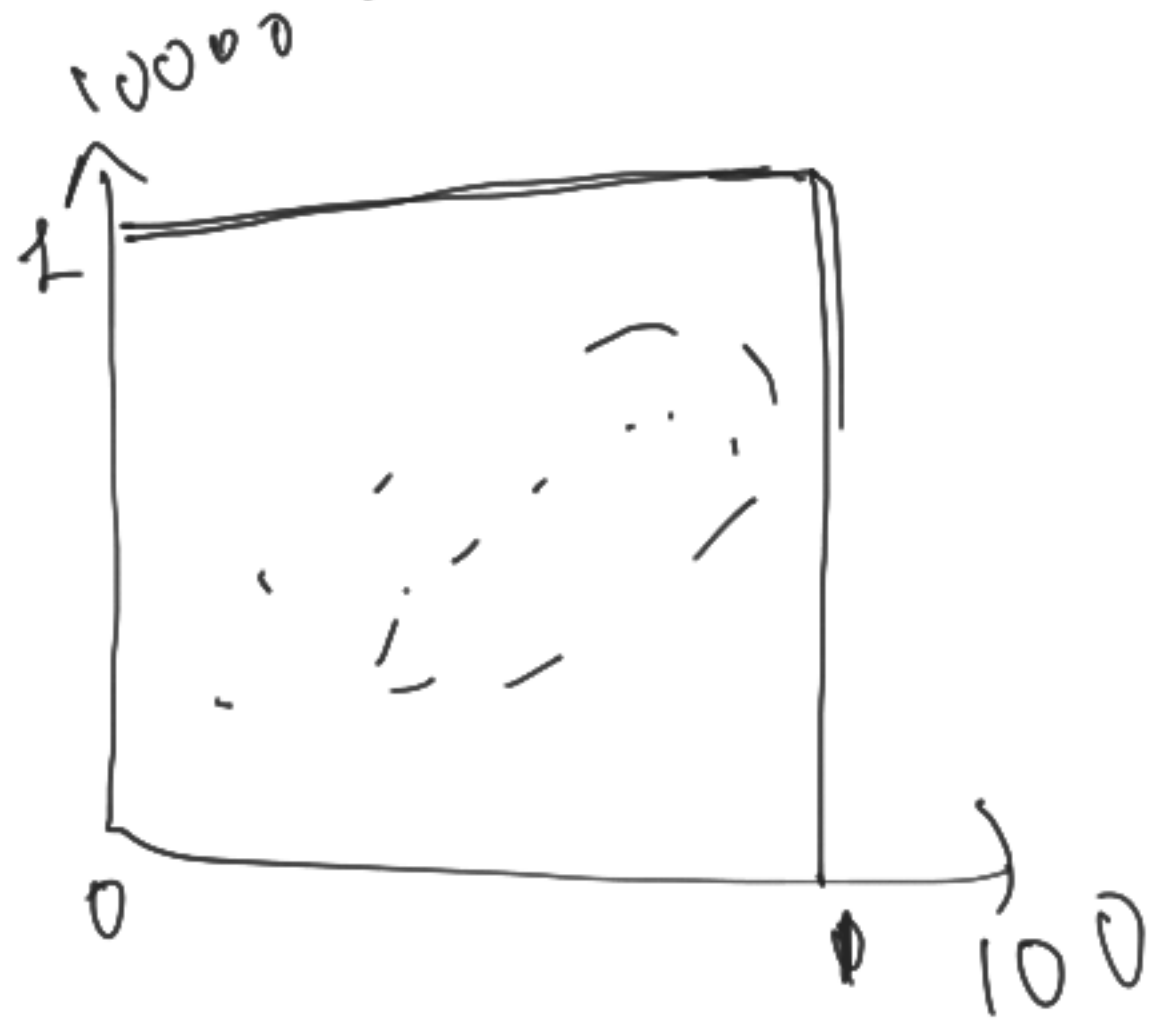# Stand

- mean centering

  ✓ mean = 0

  ✓ S.D = 1

Norm.

- Min Max Scaling

$$x_i' = \frac{x_i - x_{min}}{x_{max} - x_{min}}$$ ✓

[0, 1]

- Mean Nola

$$x_i' = \frac{x_i - \bar{x}}{x_{max} - x_{min}}$$

[-1, +1]

- Man Absolute

- Robust Scaling

Sal $\qquad$ MinMax $= \dfrac{X_i - X_{min}}{X_{max} - X_{min}}$ $\qquad$ $[\underset{=}{\overset{\downarrow}{0}}, \underset{=}{\overset{\downarrow}{1}}]$

15k

20k

$\boxed{22}$ — max

18

17

15

$\boxed{12}$ min

$= \dfrac{15 - 12}{22 - 12} = \dfrac{3}{10} = 0.3$ $\qquad$ $\dfrac{X_{max} - X_{min}}{X_{max} - X_{min}}$ 1

$= \dfrac{20 - 12}{22 - 12} = \dfrac{8}{10} = 0.8$

$= \dfrac{17 - 12}{22 - 12} = \dfrac{5}{10} = 0.5$

$X_{min} - X_{min} = 0$

Mean absolute

$$x_i' = \frac{x_i}{|x_{max}|} \quad \gg \text{Sparse}$$

0	1	0	0
0	0	0	0
0	0	0	1

Robust scaler $\rightarrow$ robust to outliers

$$x_i' = \frac{x_i - x_{median}}{IQR}$$

65 70 58 64 ...

9597

Naive Baye's
Independent
Dependent
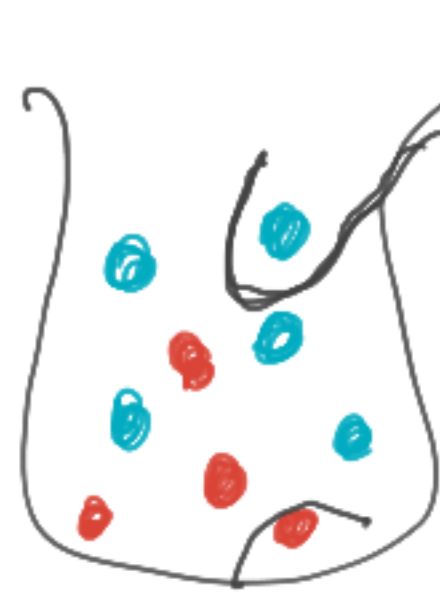
$P(B) : 5/9$

$P(R) : 4/8$

← conditional prob.

$\frac{7}{9} \times \frac{41}{82}$

$\frac{1}{18}$

$\{1, 2, 3, 4, 5, 6\}$

$P(4) = 1/6$

$P \{H, T\}$

$\boxed{H, H, H, 1/2}$

$P(R) = 4/9 \quad \frac{2K}{9} \times \frac{5}{18 \, 9}$

$P(B) = 5/8 \qquad \frac{10}{}$

$$P(R \text{ and } B) = P(B) * P(R/B) \Rightarrow \text{cond}$$

$$P(A \text{ and } B) = P(A) * P(B/A)$$

$$P(A \text{ and } B) = P(B \text{ and } A)$$

$$P(A) * \boxed{P(B/A)} = P(B) * P(A/B)$$

Bayes Theorem

$$\boxed{P(B/A)} = \frac{P(B) * P(A/B)}{P(A)}$$

x_1	x_2	x_3	y
			Yes
-	-	-	Yes
		-	No
-	-	-	

$$P\left(y_{yes} / x_1, x_2, x_3\right) = \frac{P(y_{yes}) * P((x_1, x_2, x_3)/y)}{P(x_1, x_2, x_3)}$$

$$P\left(y_{(no)} / (x_1, x_2, x_3)\right) = \frac{P(y_{(no)}) * P(x_1, x_2, x_3)/y)}{P(x_1, x_2, x_3)}$$

$$P\left(\frac{y_{(yes)}}{(x_1, x_2 .. x_n)}\right) = \frac{P(y_{yes}) * P(x_1/y) * P(x_2/y) * P(x_3/y) .. P(x_n/y)}{P(x_1) * P(x_2) \cdots * P(x_n)}$$

	Yes	No	$P(Y)$	$P(N)$
Sunny	2	3	2/9	3/5
Overcast	4	0	4/9	0
Rain	3	2	3/9	2/5
	9	5	9/14	
	1		-5	

No	Outlook	Temperature	Humidity	Windy	Play
1	Sunny	Hot	High	FALSE	No
2	Sunny	Hot	High	TRUE	No
3	Overcast	Hot	High	FALSE	Yes
4	Rain	Mild	High	FALSE	Yes
5	Rain	Cool	Normal	FALSE	Yes
6	Rain	Cool	Normal	TRUE	No
7	Overcast	Cool	Normal	TRUE	Yes
8	Sunny	Mild	High	FALSE	No
9	Sunny	Cool	Normal	FALSE	Yes
10	Rain	Mild	Normal	FALSE	Yes
11	Sunny	Mild	Normal	TRUE	Yes
12	Overcast	Mild	High	TRUE	Yes
13	Overcast	Hot	Normal	FALSE	Yes
14	Rain	Mild	High	TRUE	No

$P(Y_{yes} / outlook = Sunny) = P(y_{yes}) * P(Sunny./yes) =$

$= 9/14 * 2/9 \quad \overline{P(Sunny)}$

$P(y_{no}) = 5/14 * 3/5 =$

$= a$

$= b$

15

22

$\dfrac{15}{15+22}$

$\therefore \% \; q \; a$

$\dfrac{22}{15+22}$

$\therefore \% \; q \; b$