

Naïve Bayes Classifier Additional Comments

Naïve Bayes

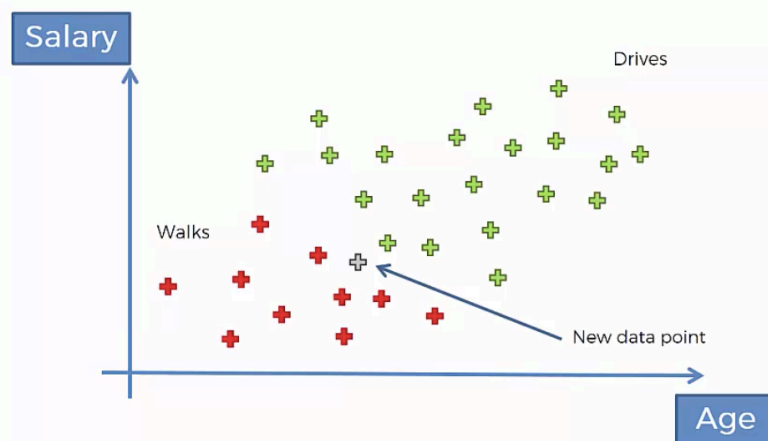
1. Q: Why “Naïve”?
2. $P(X)$
3. More than 2 features

Naïve Bayes

Q: Why “Naïve”?

A: Independence assumption

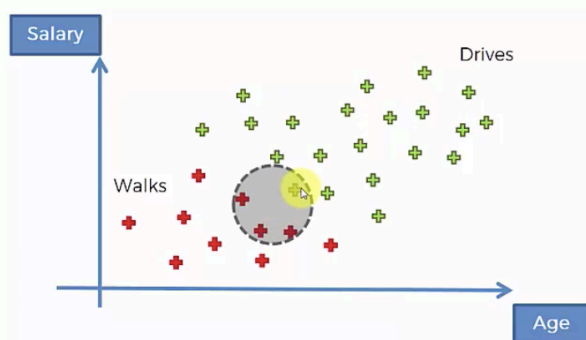
Naïve Bayes



Naïve Bayes

$P(X)$

Naïve Bayes: Step 2

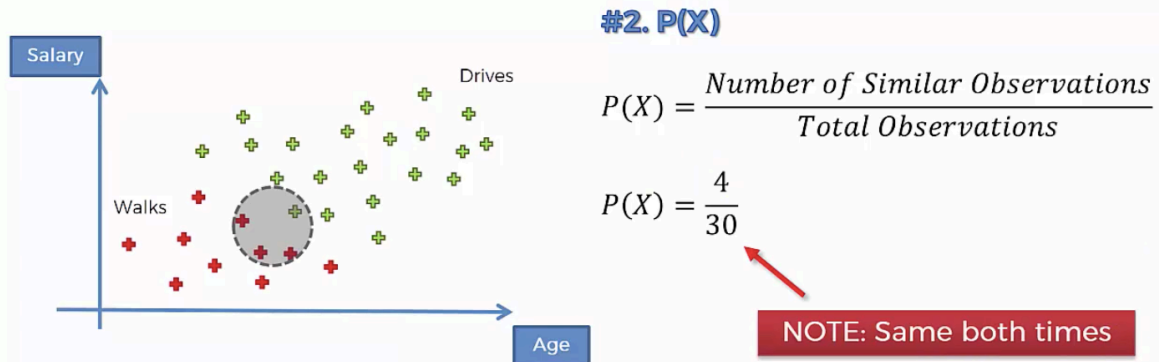


#2. $P(X)$

$$P(X) = \frac{\text{Number of Similar Observations}}{\text{Total Observations}}$$

$$P(X) = \frac{4}{30}$$

Naïve Bayes: Step 2



Step 1

#4 Posterior Probability **#3** Likelihood **#1** Prior Probability

$$P(Walks|X) = \frac{P(X|Walks) * P(Walks)}{P(X)}$$

#2 Marginal Likelihood

Read the vertical line as “given”

Step 2

#4 Posterior Probability

#3 Likelihood

#1 Prior Probability

$$P(Drives|X) = \frac{P(X|Drives) * P(Drives)}{P(X)}$$

#2 Marginal Likelihood

Step 3

$$P(Walks|X) \text{ v.s. } P(Drives|X)$$

Step 3

$$\frac{P(X|Walks) * P(Walks)}{P(X)} \quad v.s. \quad \frac{P(X|Drives) * P(Drives)}{P(X)}$$

Step 3

$$\frac{P(X|Walks) * P(Walks)}{\cancel{P(X)}} \quad v.s. \quad \frac{P(X|Drives) * P(Drives)}{\cancel{P(X)}}$$

Naïve Bayes

More than 2 classes

Step 3

$$P(Walks|X) \text{ v.s. } P(Drives|X)$$

Step 3

0.75 *v.s.* 0.25

Step 3

0.75 > 0.25

Step 3

$$P(Walks|X) > P(Drives|X)$$