Apartment : 0 House : 1 Condo : 2

X_1 : Bathrooms

X_2 : Land area

⋮

$$P(0|X_8) = P(X_8|0) \cdot P(X_2|0) \cdots P(X_8|0) * P(0)$$

$P(X_1|0)$ = is a normal distribution with calculated mean and std of the X_train.

$\text{mean}(X_1:0) = 1.28$

$\text{Std}(X_1:0) = .52$

$$P(X_1|0) = \frac{1}{.52\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x_1 - 1.28}{.52}\right)^2}$$

$X_1 = 1.5$

$= .70$

$P(X_1|1)$

$\text{mean}(X_1:1) = 1.07$

$\text{std}(X_1:1) = 0.17$

$$P(X_1|1) = \frac{1}{.17\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x_1 - 1.07}{.17}\right)^2}$$

$X_1 = 1.5$

$= .095$

$P(X_1|2)$

$\text{mean}(X_1|2) = 1.33$

$\text{std}(X_1:2) = .55$

$$P(X_1|2) = \frac{1}{.55\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x_1 - 1.33}{.55}\right)^2}$$

$X_1 : 1.5$

$= .69$

$\text{argmax}_i P(i|X) = \text{prediction}$

X_2 : land area

$P(X_2|0)$:

mean $(X_2 : 0) = 6.10$

std $(X_2 : 0) = 3.01$

$$P(X_2|0) = \frac{1}{3.01\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{6.72 - 6.10}{3.01}\right)^2}$$

$X_2 = 6.72$

$$= 0.129$$

$P(X_2|1)$:

mean $(X_2 : 1) = 6.63$

std $(X_2 : 1) = 2.08$

$$P(X_2|1) = \frac{1}{2.08\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{6.72 - 6.63}{2.08}\right)^2}$$

$$= 0.19$$

$P(X_2|2)$:

mean $(X_2 : 1) = 6.02$

std $(X_2 : 1) = 2.32$

$$P(X_2|2) = \frac{1}{2.32\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{6.72 - 6.02}{2.32}\right)^2}$$

$$= 0.16$$