SNEHITHA.T
1BM18CS159

No	Colour	Legs	Height	Smelly	Species
1	White	3	Short	Yes	M
2	Green	2	Tall	No	M
3	Green	3	Short	Yes	M
4	White	3	Short	Yes	H
5	Green	2	Short	No	M
6	White	2	Tall	No	H
7	White	2	Tall	No	H
8	White	2	Short	Yes	H

$P(M) = \frac{4}{8} = 0.5$ $P(H) = \frac{4}{8} = 0.5$

Colour	M	H
White	1/4	3/4
Green	3/4	0/4

Legs	M	H
3	2/4	1/4
2	2/4	3/4

Height	M	H
Short	3/2	2/4
Tall	1/4	2/4

Smelly	M	H
Yes	2/4	2/4
No	2/4	2/4

Instance = (colour = Green ,
legs = 2 ,
Height = Tall ,
Smelly = H)

$P(M \mid \text{New Instance}) =$

$$P(M) \times P(\text{colour} = \text{green} \mid M) \times P(\text{leg} = 2 \mid M) \times P(\text{height} = \text{Tall} \mid M) \times P(\text{smelly} = \text{No} \mid M)$$

$$= \frac{1}{2} \times \frac{3}{4} \times \frac{2}{4} \times \frac{2}{4} = \frac{1}{4} \times \frac{2}{4}$$

$$= 0.0234$$

$$P(H \mid \text{New Instance}) = \frac{1}{2} \times \frac{0}{4} \times \frac{3}{4} \times \frac{2}{4} \times \frac{2}{4}$$

$$P(M \mid \text{New Instance}) > P(H \mid \text{New Instance})$$

∴ New Instance belongs to species M

$$V_{NB}(M) = \frac{V_{NB}(M)}{V_{NB}(M) + V_{NB}(H)} = \frac{0.0234}{0.0234 + 0}$$

$$V_{NB}(H) = \frac{V_{NB}(H)}{V_{NB}(M) + V_{NB}(H)} = 0$$

$$\therefore V_{NB}(M) > V_{NB}(H)$$