

Input Age 31-40 , Income = high , Student = yes , Fair

$$P(\text{buys\_computer} = \text{yes}) = \frac{9}{14} = 0.643$$

$$P(\text{buys\_computer} = \text{No}) = \frac{5}{14} = 0.357$$

$$P(\text{age} = 31-40 \mid \text{buy\_com} = \text{yes}) = \frac{4}{9} = 0.444$$

$$P(\text{age} = 31-40 \mid \text{buy\_com} = \text{No}) = \frac{0}{5} = 0 + \frac{1}{6} \approx 0.125 \quad 0.125$$

$$P(\text{high} \mid \text{buy\_com} = \text{yes}) = \frac{2}{9} = 0.222$$

$$P(\text{high} \mid \text{buy\_com} = \text{No}) = \frac{2}{5} = 0.4$$

$$P(\text{stu} = \text{yes} \mid \text{buy\_com} = \text{yes}) = \frac{6}{9} = 0.667$$

$$P(\text{stu} = \text{yes} \mid \text{buy\_com} = \text{no}) = \frac{1}{5} = 0.2$$

$$P(\text{cr} = \text{fair} \mid \text{buy\_com} = \text{yes}) = \frac{6}{9} = 0.667$$

$$P(\text{cr} = \text{fair} \mid \text{buy\_com} = \text{No}) = \frac{2}{5} = 0.4$$

$$P(x|c_1) : P(x \mid \text{buy\_com} = \text{yes}) = 0.444 \cdot 0.222 \cdot 0.667 \cdot 0.667 = 0.0434$$

$$P(x|c_1) : P(x \mid \text{buy\_com} = \text{No}) = 0.125 \cdot 0.4 \cdot 0.2 \cdot 0.4 = 0.004$$

$$P(x|c_1) \cdot P(c_1) = 0.0434 \cdot 0.643 = 0.0281 \quad (\text{yes})$$

$$P(x|c_1) \cdot P(c_1) = 0.004 \cdot 0.357 = 0.001428 \quad (\text{No})$$

Therefore,  $x$  belongs to class ("buys\\_computer = yes")