

Test

Age 31-40, income = high, stu = yes, fair

$$P(C_i) = P(\text{buys_computer} = \text{"yes"}) = 9/14 = 0.643$$

$$P(\text{buys_computer} = \text{"no"}) = 5/14 = 0.357$$

• Compute $P(X|C_i)$ for each class

$$P(\text{age} = \text{"31-40"} | \text{buys_computer} = \text{"yes"}) = 4/9 = 0.444 \rightarrow \frac{5}{11} = 0.455$$

$$P(\text{age} = \text{"31-40"} | \text{buys_computer} = \text{"no"}) = 0 \rightarrow \frac{1}{7} = 0.143$$

$$P(\text{income} = \text{"high"} | \text{buys_computer} = \text{"yes"}) = 2/9 = 0.222$$

$$P(\text{income} = \text{"high"} | \text{buys_computer} = \text{"no"}) = 2/5 = 0.4$$

$$P(\text{student} = \text{"yes"} | \text{buys_computer} = \text{"yes"}) = 6/9 = 0.667$$

$$P(\text{student} = \text{"yes"} | \text{buys_computer} = \text{"no"}) = 1/5 = 0.2$$

$$P(\text{credit_rating} = \text{"fair"} | \text{buys_computer} = \text{"yes"}) = 6/9 = 0.667$$

$$P(\text{credit_rating} = \text{"fair"} | \text{buys_computer} = \text{"no"}) = 2/5 = 0.4$$

$$P(X|C_1) = P(X | \text{buys_computer} = \text{"yes"}) = 0.455 \times 0.222 \times 0.667 \times 0.667 = 0.045$$

$$P(X | \text{buys_computer} = \text{"no"}) = 0.143 \times 0.4 \times 0.2 \times 0.4 = 0.002$$

$$P(X|C_1) * P(C_1) = P(X | \text{buys_computer} = \text{"yes"}) * P(X | \text{buys_computer} = \text{"yes"}) \\ = 0.045 \times 0.643 = 0.029$$

$$P(X | \text{buys_computer} = \text{"no"}) * P(X | \text{buys_computer} = \text{"no"}) \\ = 0.002 \times 0.357 = 0.001$$

"yes"