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Input Age 31-40, income high, student yes, credit fair

$P(C_i)$ = P(buys_computer = "yes") = 9/14 = 0.643

P(buys_computer = "No") = 5/14 = 0.354

compute $P(X|C_i)$ for each class

P(age = "31-40" | buys_computer = "yes") = 4/9 → (4+1)/(9+2) = 0.455

P(age = "31-40" | buys_computer = "No") = 0/9 → (0+1)/(9+2) = 0.09

P(Income = "high" | buys_computer = "yes") = 2/9 = 0.2$\dot{2}$

P(Income = "high" | buys_computer = "No") = 2/9 = 0.2$\dot{2}$

P(Student = "yes" | buys_computer = "yes") = 6/9 = 0.6672

P(student = "No" | buys_computer = "No") = 1/5 = 0.2

P(Credit = "fair" | buys_computer = "yes") = 6/9 = 0.667

P(credit = "fair" | buys_computer = "No") = 2/5 = 0.4

$X = (\text{age } 31-40, \text{Income high}, \text{Student} = \text{yes}, \text{credit-rating} = \text{fair})$

$P(X|C_i)$: $P(X|\text{buys\_computer} = \text{"yes"}) = 0.455 * 0.222 * 0.6672 * 0.667 = 0.045$

$P(X|\text{buys\_computer} = \text{"No"}) = 0.09 * 0.222 \times 0.2 \times 0.4 = 0.0016$

$P(X|C_i) * P(C_i)$: $P(X|\text{buys\_computer} = \text{"yes"}) * P(\text{buys\_computer} = \text{yes}) = 0.029$

$P(X|\text{buys\_computer} = \text{"No"}) * P(\text{buys\_computer} = \text{No}) = 0.001$

Therefore, X belongs to class ("buy_computer = yes")