

age	income	student	credit_rating	buys_computer
<=30	high	no	fair	no
<=30	high	no	excellent	no
31...40	high	no	fair	yes
>40	medium	no	fair	yes
>40	low	yes	fair	yes
>40	low	yes	excellent	no
31...40	low	yes	excellent	yes
<=30	medium	no	fair	no
<=30	low	yes	fair	yes
>40	medium	yes	fair	yes
<=30	medium	yes	excellent	yes
31...40	medium	no	excellent	yes
31...40	high	yes	fair	yes
>40	medium	no	excellent	no

input Age 31-40, income = high,
student = yes, fair

- $P(C_i) : P(\text{buy_com} = \text{"Yes"}) = 9/14 = 0.643$

$$P(\text{buy_com} = \text{"No"}) = 5/14 = 0.357$$

- Com $P(X|C_i)$

$$P(\text{age "31-40" | buy_com = "Yes"}) = 4/9 = 0.444$$

$$P(\text{age "31-40" | buy_com = "No"}) = 0/5 = 0 \rightarrow 5/11 = 0.455$$

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

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

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

$$P(\text{student "Yes" | buy_com = "No"}) = 1/5 = 0.2$$

$$P(\text{cre_rat "fair" | buy_com = "Yes"}) = 6/9 = 0.667$$

$$P(\text{cre_rat "fair" | buy_com = "No"}) = 2/5 = 0.4$$

$$P(x | \text{buy_com} = \text{"Yes"}) = 0.643 \times 0.455 \times 0.222 \times 0.667 \times 0.667 = 0.029$$

$$P(x | \text{buy_com} = \text{"No"}) = 0.357 \times 0.142 \times 0.4 \times 0.2 \times 0.4 = 0.002$$

$$0.643 \times 0.028 = 0.018 \checkmark$$

$$0.357 \times 0.002 = 0.0002$$

Therefore, x belongs to class ("buy_com = Yes")