K17-3730.
Sec C.
Eisha.

**Date:** Naive Bayes Classifier.

Refund = no
Marital = ~~sig~~ single
} loan → yes, no = ?

$$P(\neg Cheat \mid no, S) = \frac{P(no, S \mid \neg Cheat) \cdot P(\neg Cheat)}{P(no, S)}$$

$$= \frac{P(no \mid \neg cheat) \times P(S \mid \neg cheat) \times P(\neg cheat)}{P(no, S)}$$

$$= \frac{\frac{4}{7} \times \frac{2}{7} \times \frac{7}{10}}{P(no, S)}$$

$$= 0.114 \longrightarrow \text{probability of no. cheat.}$$

$$P(cheat \mid no, S) = \frac{P(no, S \mid cheat) \cdot P(cheat)}{P(no, S)}$$

$$= \frac{P(no \mid cheat) \times P(S \mid cheat) \times P(cheat)}{P(no, S)}$$

$$= \frac{3}{3} \times \frac{2}{3} \times \frac{3}{10}$$

$$= 0.2 \longrightarrow \text{probability of (yes). cheat}$$

∴

$0.2 > 0.114$.

↙ yes cheat ↘ no cheat.

so the result is "yes cheat"!