Part A

U19CS012   [BHAGYA   VINOD   RANA]

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1.> minimizing the Risk $\sim$ maximizing the posterier probability

(Classification problem modelled using gaussian)

1.>

① An   accepted   low risk   customer $\longrightarrow$ increases profit

A   rejected   high risk   customer $\rightarrow$ decreases   loss

② Loss   for   high risk   customer   erroneously   accepted

is   different from   the   gain   for   an   erroneously   rejected

low risk   customer.

③ $x_1 \rightarrow$ income & $x_2 \rightarrow$ saving

let decide   Outcome

$c = 1$ high risk & $c = 0$ low risk

④ For   any   new data $X_1 = x_1$ and $X_2 = x_2$ knowing

$P(c \mid x_1, x_2)$ we can   choose

ⓐ $c = 1$, if $P(c=1 \mid x_1, x_2) > 0.5$ and $c = 0$ otherwise

ⓑ $c = 1$, if $P(c=1 \mid x_1, x_2) > P(c=0 \mid x_1, x_2)$ and $c = 0$

otherwise

⑤ Probability of error = $1 - \max\left(\begin{array}{c} P(c=1 \mid x_1, x_2), \\ P(c=0 \mid x_1, x_2) \end{array} \right)$

Therefore, we

are   minimizing the risk   maximizing the posterier

by maximizing the pro posterier   probability

probability