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Assignment 10
4/22/24

1. Naive Bayesian method:

X = (age = Senior, Income = medium, Student = no, Credit_rating = Fair)

P(age = Senior | buy_comp = yes) = 3/9 = 0.333
P(age = Senior | buy_comp = no) = 2/5 = 0.4
P(incom = med | buy_comp = yes) = 4/9 = 0.444
P(income = med | buy_comp = no) = 2/5 = 0.4
P(student = no | buy_comp = yes) 3/9 = 0.333
P(student = no | buy_comp = no) = 4/5 = 0.8
P(credit = fair | buy_comp = yes) = 6/9 = 0.667
P(credit = fair | buy_comp = no) = 2/5 = 0.4

P(X | yes) = 0.033
P(X | no) = 0.051

X belongs to class ("buys_computer = yes")

2. Accuracy = $\frac{TP+TN}{P+N} = \frac{90+9560}{300+9700} = 96\%$

Sensitivity = $\frac{TP}{P} = \frac{90}{300} = 30\%$

Specificity = $\frac{TN}{N} = \frac{9560}{9700} = 98.6\%$

Precision = $\frac{TP}{TP+FP} = \frac{90}{90+140} = 39.1\%$

Recall = $\frac{TP}{TP+FN} = \frac{90}{90+210} = 30\%$

F1 Measure = $\frac{(1+1) \times \text{precision} \times \text{recall}}{1 \text{precision} + \text{recall}} = \frac{2 \times .3 \times .39}{.3 + .39} = 33.9\%$