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20

MTH 552: Quiz #2
Full Marks 20

Consider the 2 bivariate populations, Π_1 and Π_2, with the following joint probability mass functions:

Π_1

x_2 \ x_1	0	1
0	0.2	0.15
1	0.15	0.25
2	0.05	0.2

Π_2

x_2 \ x_1	0	1
0	0.15	0.25
1	0.2	0.15
2	0.2	0.05

(i) If the prior probabilities of the populations are $p(\Pi_1) = 0.6$ and $p(\Pi_2) = 0.4$, find the TPM minimizing classification rule.

(ii) Find the TPM of the rule obtained in (i).

(iii) Assuming that the prior probabilities of the populations are equal and the misclassification costs are $C(1|2) = 1$ and $C(2|1) = 2$, find the ECM minimizing classification rule.

(iv) Find the ECM and TPM of the rule obtained in (iii).

$\mathcal{X} = \{(0,0)(0,1)(0,2)(1,0)(1,1)(1,2)\}$.