List 2 Exercise 1 PDF for UMSI

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1 Task Description

Let $X \in \{0, 1\}$ be an input drawn from a Bernoulli distribution $B(p)$ $p < \frac{1}{2}$, and let $Y \in \{0, 1\}$ be the output obtained as follows:

$$Y = \begin{cases} X & \text{with probability } 1 - p, \\ 1 - X & \text{with probability } p \end{cases}$$

Determine the optimal Bayes classifier and its risk.

2 Solution