Problem Statement-2

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Let us consider data (x) generated randomly which can take two possible values 0 and 1 of length n=1000 stored in vector $\mathbf{x}_{1\times1000}$. Add noise of length n=1000 to it using randn() function (which generate the Gaussian distributed noise) and stored in vector $\mathbf{z}_{1\times1000}$.

Observation can be given by vector $\mathbf{y}_{1\times1000}$ as

$$\mathbf{y} = \mathbf{x} + 0.2\,\mathbf{z}. \tag{1}$$

From the given observation, determine $\mathbf{x}_{estimate}$ and classify if the input was 0 or 1. Then, find out the number of **errors** $= \mathbf{x} - \mathbf{x}_{estimate}$ for various values of noise power.