

Example:

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EECS 861
Homework 13

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1. We want to estimate a received signal X from K observations of Y where Y is modeled as $Y=X+N$. Here, $K=20$ and

$$\bar{y} = \frac{1}{20} \sum_{i=1}^{20} y_i = 18$$

N is Gaussian with $N(0, \sigma_N^2)$

X is Gaussian with $N(12, \sigma_X^2)$

N and X are S.I., For the following 3 cases:

Case 1. $\sigma_N^2 = 0.1$, $\sigma_X^2 = 15$

Case 2. $\sigma_N^2 = 15$, $\sigma_X^2 = 15$

Case 3. $\sigma_N^2 = 15$, $\sigma_X^2 = 0.1$

- a. The MAP estimator for X .

- | |
|-----------------------------------|
| 1. $\hat{\theta}_{MAP} = 18$ |
| 2. $\hat{\theta}_{MAP} = 17.7143$ |
| 3. $\hat{\theta}_{MAP} = 12$ |

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