

Sample Problem.

Seq. Pr.	D10	OP
0	1.0	0
1	0.6	0.5
2	0.3	0.9
3	0.1	0.9
4	0.0	0.866

$$c_n = a_1 c_{n-1} + b_1 m_{n-1}$$

$$P = \frac{1}{4} \sum_{n=1}^4 (\hat{c}_n - a_1 \hat{c}_{n-1} - b_1 \hat{m}_{n-1})^2$$

$$\frac{\partial P}{\partial a_1} = \sum_{n=1}^4 2 (\hat{c}_n - a_1 \hat{c}_{n-1} - b_1 \hat{m}_{n-1}) (-\hat{c}_{n-1}) = 0$$

$$1.8881 a_1 + 0.661 b_1 = 2.057$$

$$0.661 a_1 + 1.46 b_1 = 1.39996$$

$$a_1 = 0.896$$

$$b_1 = 0.553$$



Assignment to be submitted:

1. A process, whose dynamics are not well known, is initially at steady state. An input signal is introduced to the system. The sampled values of the input as well as the output response at different time instants are as follows:

Sampling instant	Input variable (units)	Output variable (units)
0	1.0	0.0
1	0.65	0.6
2	0.2	0.82
3	0.1	0.94

Identify the parameters of the process assuming first order model.

2. A process, whose dynamics are not well known, is initially at steady state. An input signal is introduced to the system. The sampled values of the input as well as the output response at different time instants are as follows:

Sampling instant	Input variable (units)	Output variable (units)
0	1.0	0.0
1	0.4	0.7
2	0.25	0.8
3	0.1	0.9

Identify the parameters of the process assuming first order model

A two dimensional biomedical data is shown in the table given below. Two dimensions are taken as x and y . Physical significance of each dimension is not disclosed. Find and choose a suitable principal component for the data set to reduce its dimension. Show the modified data.

x	y
8	5
4	1
6	3
8	6
8	5
11	8

5	3
9	5
7	4
8	2