**Prob.1** Batch Process and Recursive Process

Consider following data {1,2,3,…,10}, find the average of data

data = {1,2,3,4,5,6,7,8,9,10}

1. Batch process
2. Recursive process
3. Compare two values

**Prob.2: Least Square Estimator**

A particle moving with a constant acceleration is modelled such as the position

where are initial position, velocity and acceleration. The measured sampling position

is corrupted by a noise as following

0 14.0349 1.0000 169.3004

0.1000 21.7202 1.1000 184.4902

0.2000 34.6844 1.2000 202.4740

0.3000 47.0785 1.3000 227.9237

0.4000 61.3167 1.4000 255.3597

0.5000 74.0223 1.5000 280.4468

0.6000 91.4801 1.6000 303.4491

0.7000 105.7166 1.7000 331.3622

0.8000 130.8415 1.8000 360.9363

0.9000 141.4428 1.9000 381.0479

1. Draw the
2. If it is modeled as

Determine the matrix

1. Find the least square error estimator
2. Draw
3. Let the model as

Find the least square error estimator

**Prob 3:**

Consider a random variable , whose probability density is

1. Find the mean
2. Find the variance of

**Prob. 4** Consider two Voltage Meters , with different resolution as

= 1 Volt, Resolution of = 0.1 Volt

1. Find the variance of ,
2. If you measure a voltage of a resistor two meters, the measured values are

What is the best estimator of the resistor voltage?

**Prob. 5** The conditional probability

Consider the followings.

Let’s denote the event of active covid-19 as and of the high temperature , the high heart rate And the joint probability as

1. the probability of the temperature high ?
2. the probability of the temperature high ?
3. the conditional probability ?
4. the conditional probability
5. Which indicator is more effective as to screen covid?
6. Now consider which may be a better indicator. In order to calculate , which additional probability should be known?