Department of Industrial and Systems Engineering
Indian Institute of Technology, Kharagpur
Simulation Lab
Excel Sheet Assignment

Time-2:00 pm to 5:00 pm **Date: 12/03/2021**

Demonstration problem

1. A classical inventory problem concerns the purchase and sale of newspapers. The newsstand buys the papers for 33 cents each and sells them for 50 cents each. Newspapers not sold at the end of the day are sold as scrap for 5 cents each. Newspapers can be purchased in bundles of 10. Thus, the newsstand can buy 50, 60, and so on. The distribution of newspapers demanded on each of these days is given in Table 1.1. Assume daily demand: 80, selling price: 2, cost: 1.5, Salvage value:0.25, loss of profit: 0.5. The problem is to compute the optimal number of papers the newsstand should purchase. This will be accomplished by simulating demands for 20 days and recording profits from sales each day.

Table 1.1 Distribution of Newspapers demanded Per Day

Demand	Probability	Range
40	0.03	1 to 3
50	0.05	4 to 8
60	0.15	9 to 23
70	0.20	24 to 43
80	0.35	44 to 78
90	0.15	79 to 93
100	0.07	94 to 100

Practice Problems:

1. Trucks are used to haul coal from a small manufacturing company to the train. Capacity of train is 53. Each truck is loaded by one of two loaders. After a loading, the truck immediately moves to the scale, to be weighed as soon as possible. Both the loaders and the scale have a first-come-first-served waiting line (or queue) for trucks. Travel time from a loader to the scale is considered negligible. Production quantity of manufacturing plant per day with probability distribution is given in Table 1.2 together with the random digit assignment. The purpose of the simulation is to estimate quantity for which trucks waiting to be shipped and average Empty spaces on the train.

Table 1.2 Distribution of Production quantity

Production/Day	Probability	Cumulative Probability	Range
45	0.03	0.03	1-3
46	0.05	0.08	4-8

47	0.07	0.15	9-15
48	0.1	0.25	16-25
49	0.15	0.4	26-40
50	0.2	0.6	41-60
51	0.15	0.75	61-75
52	0.1	0.85	76-85
53	0.07	0.92	86-92
54	0.05	0.97	93-97
55	0.03	1	98-100