

## Homework 3: Random-Variate Generation

The objective of Homework 3 is for students to develop understanding of generating samples from a specified distribution as input to a simulation model and to practice some commonly-used techniques for generating random variates (Inverse-transform technique and Acceptance-rejection technique).

For submission, kindly submit your work for all questions in 1 PDF file and 1 Excel file.

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### Exercise 1: Random-variate generation using Inverse-transform technique

Given random numbers  $R_i = \{0.1306, 0.0422, 0.6597, 0.7965, 0.8213\}$ .

Develop a random-variate generator and generate five values of the random variate for each of the following cases:

- Random variables follow an exponential distribution with  $\lambda = 2$ .
- Random variables are uniformly distributed on the interval  $[1,3]$ .
- Random variables follow a triangular distribution with endpoints  $(0,4)$  and mode at 2.
- Distribution of variables is given as:

<i>Observed value</i>	<i>Frequency of occurrence</i>
50	0.24
52	0.20
45	0.12
55	0.09
53	0.35

### Exercise 2: Random-variate generation using Acceptance-Rejection technique

Given  $R_i = \{0.102, 0.047, 0.334, 0.684, 0.812\}$ . Generate five Poisson variates with mean  $\alpha = 0.3$ .