CHAPTER 6
DISCRETE RANDOM VARIABLES

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This chapter begins a more thorough and methodical description of random variables, their properties, how they can be used to model the stochastic (random) components of a system of interest, and the development of algorithms for generating the associated random variates for a Monte Carlo or discrete-event simulation model. This chapter is devoted entirely to describing and generating discrete random variables. The next chapter is devoted to describing and generating continuous random variables.

Section 6.1 defines a discrete random variable and introduces four popular models: the Bernoulli, binomial, Pascal, and Poisson distributions. Section 6.2 contains an approach to generating discrete random variables that is more general than the ad hoc approaches given earlier for the $\mathit{Equilikely}(a, b)$ variate and the $\mathit{Geometric}(p)$ variate. Section 6.3 applies these variate generation techniques to the simple inventory system. Section 6.4 contains a summary of the six discrete distributions encountered thus far. Finally, Section 6.5 departs slightly from the topic of discrete random variables and considers the related topic of the development of algorithms for shuffling and drawing random samples from a group of objects.