Today:
1. Discrete Uniform Distribution
2. Binomial Distribution

In Class Exercises:
1. A study is being conducted in which the health of two independent groups of ten policyholders is being monitored over a one-year period of time. Individual participants in the study drop out before the end of the study with probability 0.2 (independently of the other participants). What is the probability that at least 9 participants complete the study in one of the two groups, but not in both groups?

2. A company establishes a fund of 120 from which it wants to pay an amount, C, to any of its 20 employees who achieve a high performance level during the coming year. Each employee has a 2% chance of achieving a high performance level during the coming year, independent of any other employee. Determine the maximum value of C for which the probability is less than 1% that the fund will be inadequate to cover all payments for high performance.
3. A large pool of adults earning their first driver’s license includes 50% low-risk drivers, 30% moderate-risk drivers, and 20% high-risk drivers. Because these drivers have no prior driving record, an insurance company considers each driver to be randomly selected from the pool. This month, the insurance company writes 4 new policies for adults earning their first driver’s license. What is the probability that these 4 will contain at least two more high-risk drivers than low-risk drivers?

4. A company prices its hurricane insurance using the following assumptions:

(i) In any calendar year, there can be at most one hurricane.
(ii) In any calendar year, the probability of a hurricane is 0.05
(iii) The number of hurricanes in any calendar year is independent of the number of hurricanes in any other calendar year.

Using the company’s assumptions, calculate the probability that there are fewer than 3 hurricanes in a 20-year period.