

3. Ms. Fey is a manager at a restaurant. To improve the dining experience for her customers, she uses a digital music service to create a playlist of songs that will be played in the restaurant. The playlist contains 1,000 songs and consists of four different types of music in the following quantities: 200 country songs, 400 pop songs, 100 rock songs, and 300 jazz songs. The digital music service will select songs at random from the playlist to be played in the restaurant. Any song can be replayed at any time.

A.

- i. Suppose one song is selected at random to be played. What is the probability that the song is a rock song? Show your work.
- ii. Suppose two songs are selected at random to be played. What is the probability that both songs are rock songs? Show your work.

- B.** In every one-hour period, 20 songs will be played at random and any song can be replayed at any time. Ms. Fey is interested in how many rock songs will be played in a typical one-hour period.

- i. Define the random variable of interest to Ms. Fey, and state how the random variable is distributed.
- ii. What is the expected value for the random variable in part B (i)? Show your work.

- C.** Recall that in every one-hour period, 20 songs will be played at random and any song can be replayed at any time.

- i. Determine the probability that 4 or more rock songs in a particular one-hour period will be played. Show your work.
- ii. Suppose 4 rock songs are played during a particular one-hour period. Does this provide strong evidence that the song selection process was not truly random? Justify your answer without performing an inference procedure.