1a. Miles and Ella select 2 tickets (without replacement) from a jar containing tickets numbered 1 to 300. What is the probability that their 2 numbers are adjacent?

1b. Miles, Ella, and Billie select 3 tickets (without replacement) from a jar containing tickets numbered 1 to 50. What is the probability that their 3 numbers are all adjacent, i.e., form a group of 3 consecutive tickets?

2. Consider a bag of jelly beans, which contains 20 licorice flavored jelly beans and 30 fruit (non licorice) flavored. Norah only likes fruit flavored jelly beans, so she randomly eats them until she encounters the first licorice flavored jelly bean, and then she stops (without swallowing the first licorice flavored jelly bean).

2a. How many jelly beans does she expect to eat (not counting the first licorice flavored jelly bean)?

2b. What is the variance of the number of jelly beans that she eats (not counting the first licorice flavored jelly bean)?

3. At a jazz listening session, there are 10 jazz LP's and they have all been taken out of their album covers and placed in random locations around the room. The people responsible for cleaning the room afterwards (unfortunately) do not pay any attention when putting the LP's back into the album covers. They just randomly put 1 LP back into each of the 10 album covers.

3a. How many LP's do we expect get put back into their correct album covers?

3b. What is the variance of the number of LP's that get put back into their correct album covers?

4. Suppose that Louis rolls a 6-sided die 10 times, and as he is doing this, Coleman rolls a 4-sided die 10 times. Let their rolls be $U_1, \ldots, U_{10}$ (for Louis's rolls), and $V_1, \ldots, V_{10}$ (for Coleman's rolls).

Let X denote the number of times that Louis's and Coleman's rolls agree. I.e., let X denote the number of values of j for which $U_j = V_j$ (i.e., for which the jth rolls are the same).

What kind of distribution does X have? What is/are the parameter(s) of X?