The Birthday Problem. Suppose there are k people in a room. What is the probability that there is at least one match among the k birthdays?

A capella Problem. An a cappella group consisting of Alf, Bill, Cal, Deb, Eve, and Fay (3 boys and 3 girls) are deciding how to arrange themselves from left to right in a row on stage. How many ways are there to do this if

- there are no restrictions?
- the boys should be next to each other and so should the girls?
- just the boys need to be next to each other?
- there are 3 couples (Alf&Deb, Bill&Eve, Cal&Fay), and the two members of each couple want to stand next to each other?
- Alf and Fay are the least skilled singers and tend to drift off key, so they should not stand next toeach other?