

CS 228, Probability Exercises II

Name:

Some questions are from **Discrete Mathematics and It's Applications 7e** by Kenneth Rosen.

- What is the probability that two people chosen at random were born during the same month of the year?

- What is the probability that in a group of n people, there are at least two born in the same month?

- How many people chosen at random are needed to make the probability greater than $1/2$ that there are at least two people born in the same month?

- How many people chosen at random are needed to make the probability 1 that there are at least two people born in the same month?

- Assume that the probability a child is a boy is $.49$ and that the sexes of children born into a family are independent. What is the probability that a family of 6 children has:
 - exactly three boys? (Use the formula for the binomial distribution.)

 - at least one boy?

 - at least one girl?

 - all children of the same sex?

- The following statements are true according to a large-scale scientific study:
 - The probability that a randomly selected person is successful is .3.
 - The probability that a randomly selected person is a hard worker is .5.
 - The probability that a person is both successful and hard-working is .2.

Are success and hard work independent? Justify your answer.

What is the conditional probability of success given hard work?