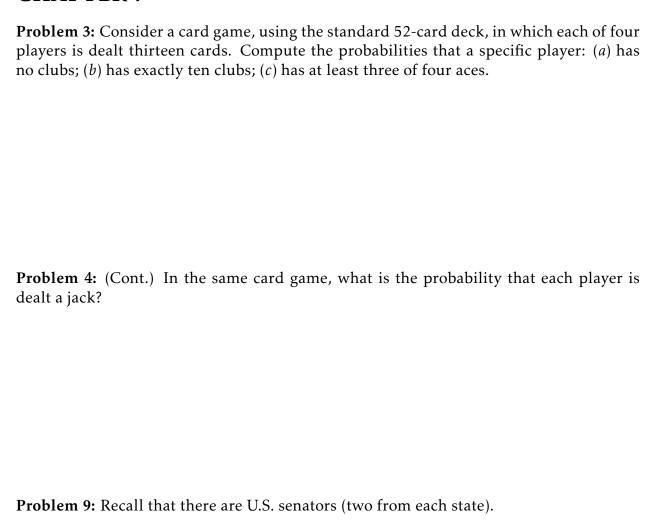
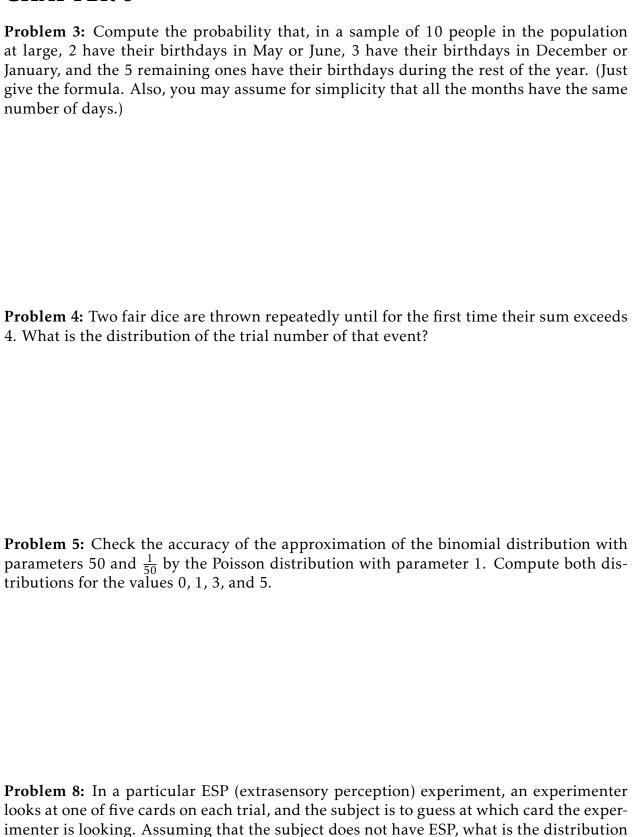
CHAPTER 7



- (i) If two senators are chosen at random, what is the probability that they are from the same state?
- (ii) If the 100 senators are organized into disjoint sets of two, what is the probability that, in each set, the two senators are from the same state?
- (iii) In a committee of ten senators, what is the probability that no two are from the same state? (Assume that there are no restrictions on committee memberships)

CHAPTER 8



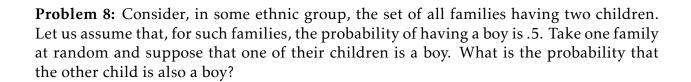
of the outcome	(successful	guess,	unsuccessful	guess)	of a trial?
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CHAPTER 9

Problem 1: Archie has three coins in his pocket: a standard coin, a coin with heads on both sides, and a coin with tails on both sides. He pulls one coin out of his pocket, looks at one side of the coin, and notices that it is a tail. He reasons that the probability of seeing a head on the other side of this coin is $\frac{1}{2}$. Do you agree with his reasoning?

Problem 2: Let a, b, and c be outcomes in some finite sample space Ω having 2^{Ω} as a field of events, with some probability measure \mathbb{P} . You are told that $\mathbb{P}(\{a,b\}|\{b,c\}) = \alpha$ and that $\mathbb{P}(\{c\}) = \beta$.

- (i) Compute $\mathbb{P}(\{b\})$ in terms of α and β .
- (ii) Give some possible values for α and β .
- (iii) Find constraints on α and β , that is, find a general expression constraining the possible values of α and β .
- (iv) Find an expression constraining the possible values of $\mathbb{P}(\{a\})$.



Problem 12: An astronomer has detected punctual signals from an unknown source in the sky. The signals are of two kinds, which she denotes 'A' and 'B.' She assumes that the occurrence of the signals is governed by a random process, namely, that the number of signals of any kind received in the course of one hour has a Poisson distribution with parameter λ . When a signal occurs, it is an 'A' signal with probability θ and a 'B' signal with probability $1 - \theta$. Write a formula for the distribution of 'A' signals received in one hour.