

**Paul J. Nahin: Will You Be Alive 10 Years from Now?,
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REVIEWED BY GABRIELLE KELLY

This book outlines some of the more interesting results that arise when studying probability or statistics for the first time. The book is laid out in an Introduction, followed by 25 chapters and a final chapter with challenge problem solutions. The title comes from one particular chapter in the book (chapter 23) that deals with life expectancy and is not indicative of the type of problem dealt with in general. The most common topics the book deals with are combinatorial problems. Although the author claims there is little in the book by way of statistical problems, I found this to be not so. Topics covered range from distribution of maxima and minima of uniform random variables to the memoryless property of the exponential distribution and these arise naturally when studying statistics. Each chapter has some topic that is formulated by way of a question with a theoretical answer and a simulation solution using MATLAB is also given. The introduction is interesting from a historical point of view and also gives a flavour of the type of problems and results that follow. It is interesting to classify the chapters by type of problem. Chapter 2 is a probability counting problem. Chapter 3 presents an occupancy problem. Chapter 4 deals with the geometric distribution. Chapter 5 deals with the uniform distribution. Chapter 6 is estimating population size. Chapter 7 presents a quite tricky problem on the probability a chain letter will end. Chapter 8 and 9 are probability problems involving enumerating all possibilities. Chapter 10 concerns statistical hypothesis testing. Chapter 11 is a runs problem. Chapter 12 is a probability problem with an infinite sum involving Eulers constant and one of the more interesting chapters. Chapter 13 is a combinatorial problem. Chapter 14 reads more like a lesson on integration. Chapter 15 is one of the few

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where the solution to a probability problem is motivated by an important application. Chapter 16 deals with the uniform distribution again. Chapter 17 deals with false positive and negative rates from test results. Chapter 18 mainly involves doing an intricate integral. Chapter 19 dealing with the memoryless property of the exponential distribution gives one of the more interesting results. Chapter 20 is the ballot problem (but not motivated by a random walk as most texts). Chapter 21 deals with maxima of uniform random variables. Chapter 22 involves setting up a double difference equation to solve a probability problem winning at Ping-Pong or squash. Chapter 23 is a little disappointing as it assumes a hypothetical life-expectancy distribution is available. Chapter 24 presents further counting problems. Chapter 25 presents Newcombs paradox - another interesting chapter - this one without a solution and providing food for thought. The solutions to challenge problems are in Chapter 26 many of which involve geometry and integration. Thus many topics arise naturally when studying statistics — most students of statistics are familiar with the distribution of maximum and minimum of random variables, conditional probability, the Gamblers ruin problem, false positive and negative rates among others. A drawback of the book is that there is no intrinsic order to the Chapters. Thus for a student of probability the solutions to many of the problems are just one-off and the lack of coherent structure mitigates against learning how to do them. Also many of the problems posed are artificial and are not motivated by important everyday problems e.g. Steve's elevator problem in Chapter 3 or the chicken in boxes problem Chapter 24. However, what is considered an interesting problem can be subjective as the author indicates by the Note to what he terms the Plum Pudding problem in Chapter 21. On the plus side, the book provides useful problems for an instructor wishing to improve their student's ability at combinatorics, statistical distribution theory and calculus (specifically integration). It also provides useful MATHLAB problems. In addition the book showcases some of the famous problems in probability and statistics like the Gambler's ruin problem, Simpson's paradox (both in the Introduction) and the ballot problem. Thus the book also provides motivation for an interested student or reader to pursue the study of probability and statistics to a deeper level.

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