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medical decisions; 4.3.1 Length and quality of life; 4.3.2 Standard gamble for health states; 4.3.3 The time trade-off methods; 4.3.4 Relation between QALYs and utilities  
 4.3.5 Utilities for time in ill health 4.3.6 Difficulties in assessing utility;  
 4.4 Exercises; 5 Ramsey and Savage; 5.1 Ramsey's theory; 5.2 Savage's theory; 5.2.1 Notation and overview; 5.2.2 The sure thing principle; 5.2.3 Conditional and a posteriori preferences; 5.2.4 Subjective probability; 5.2.5 Utility and expected utility; 5.3 Allais revisited; 5.4 Ellsberg paradox; 5.5 Exercises; 6 State independence; 6.1 Horse lotteries; 6.2 State-dependent utilities; 6.3 State-independent utilities; 6.4 Anscombe-Aumann representation theorem; 6.5 Exercises; Part Two Statistical Decision Theory  
 7 Decision functions 7.1 Basic concepts; 7.1.1 The loss function; 7.1.2 Minimax; 7.1.3 Expected utility principle; 7.1.4 Illustrations; 7.2 Data-based decisions; 7.2.1 Risk; 7.2.2 Optimality principles; 7.2.3 Rationality principles and the Likelihood Principle; 7.2.4 Nuisance parameters; 7.3 The travel insurance example; 7.4 Randomized decision rules; 7.5 Classification and hypothesis tests; 7.5.1 Hypothesis testing; 7.5.2 Multiple hypothesis testing; 7.5.3 Classification; 7.6 Estimation; 7.6.1 Point estimation; 7.6.2 Interval inference; 7.7 Minimax-Bayes connections; 7.8 Exercises  
 8 Admissibility 8.1 Admissibility and completeness; 8.2 Admissibility and minimax; 8.3 Admissibility and Bayes; 8.3.1 Proper Bayes rules; 8.3.2 Generalized Bayes rules; 8.4 Complete classes; 8.4.1 Completeness and Bayes; 8.4.2 Sufficiency and the Rao-Blackwell inequality; 8.4.3 The Neyman-Pearson lemma; 8.5 Using the same level across studies with different sample sizes is inadmissible; 8.6 Exercises; 9 Shrinkage; 9.1 The Stein effect; 9.2 Geometric and empirical Bayes heuristics; 9.2.1 Is  $x$  too big for ?; 9.2.2 Empirical Bayes shrinkage; 9.3 General shrinkage functions  
 9.3.1 Unbiased estimation of the risk of  $x + g(x)$

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Sommario/riassunto

Decision theory provides a formal framework for making logical choices in the face of uncertainty. Given a set of alternatives, a set of consequences, and a correspondence between those sets, decision theory offers conceptually simple procedures for choice. This book presents an overview of the fundamental concepts and outcomes of rational decision making under uncertainty, highlighting the implications for statistical practice. The authors have developed a series of self contained chapters focusing on bridging the gaps between the different fields that have contributed to rational decisi

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