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Introductory Statistics and Analytics: A Resampling Perspective

The field of statistics has vastly changed in the last 20 years. This book acknowledges this and provides an introductory courses for students not from statistical or mathematical backgrounds to learn statistics. The approach taken is to use simulation and/or resampling to obtain indications of hypothesis strength rather than the formulaic approach typically taught at the introduction level (although that is briefly included too). It is clear that this book is created from a course that has been developed over many years into the polished version provided; there are many questions littered through the text as well as in dedicated sections at the end of each chapter. My main disappointment with this book is the section on "Displaying and Exploring Data"; this feels like it is still stuck in the past and does not take the refreshing view that is present throughout the rest of the book. There is much beyond bar charts, pie charts and line graphs!

The book is organized into 13 sections starting with the basic ideas of randomness and how to design a statistical study through probability distributions, confidence intervals and hypothesis testing to ANOVA and multiple regression. One of the inspiring aspects of the book is the use of real world examples; each concept introduced is described using a real world example that often draws on past media events or experiences that the majority of people can relate to. For example, using posting online reviews for a product to discuss bias; the banking collapse to describe independence assumptions; fat absorption of doughnuts for ANOVA and multiple testing.

This book is designed to stand the test of time, the content is devoted to explaining the why's and when's and there is supplementary material on the book website that contains the how's for using **StatCrunch**, **Box Sampler** and **Resampling Stats** or R alongside the book (presumably the idea is that these will be updated with new versions). As an example, the book tells you in words how to conduct resampling for a confidence interval but does not give you the code to do so, that is given in the online supplement. In that way this book is agnostic of the software that you want to use.

The supplements appear to be unchanged from those used in the course as students and lessons are referred to throughout. Similarly the links to data in the supplements direct the

user to a website where this reviewer cannot login nor create an account without enrolling on the course. Having said this, the data is provided within the `.zip` download so you are able to complete the tasks. This reviewer does not have access to **Resampling Stats** nor **StatCrunch** as these require paid subscriptions. Thus I will stick to the R supplement. Following an initial introduction to download R and **RStudio** and a caveat around how there are multiple ways to achieve the same end result the author delves into the first task of simulating Heads and Tails. What did surprise me was that there was no discussion of `set.seed()` to allow replication of results. Instead there is a paragraph discussing how results you get will be different from those listed due to randomness; this is an interesting choice and indeed reinforces the idea of randomness. One quickly realizes that the R supplement is not as up-to-date as the other, indeed there is no contents page and the chapters do not match the book. As one drills down further, there are several chapters where the examples given do not match examples in the book whereas the other supplement does. This coupled with the fact that there is not much surrounding information at the start of the example means that it is hard for the reader to use the supplement with the book if you are following through chapter by chapter. Similarly it is almost impossible to pick up the book to read a specific section and pick out which part of the supplement it corresponds to. This is a disappointing addition to an otherwise solid book.

Resampling is a practical tool that is not often taught in traditional introductory statistics courses. This should change and I would recommend this book as an accompaniment to any introductory statistics course regardless of background of the student, but those with mathematical backgrounds will need to learn how to write statistics and probability statements from an alternative source. If you are planning to use this text for your teaching with R then you will need to prepare the associated code as the supplement is far from sufficient. Overall, this book provides a step-by-step introductory course to statistics for those with a non-mathematical background using plenty of real world examples and questions to test your knowledge.

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