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Abstract

The subject of this book is the application of statistical methods in the analysis of geographic phenomena and falls within the field of Spatial Analysis. Various methods of descriptive and inferential statistics are presented together with their applications in spatial data analysis, including spatial statistics. Several examples of classical statistical methods are carried out employing statistical analysis software, while analysis of spatial data is implemented in a GIS environment. The book's target audience is undergraduate students in disciplines relevant to geographical information science. Basic mathematical background is required and the emphasis is on the understanding of concepts and techniques. Only the most commonly used methods in empirical research of geographical problems are presented in this book. The book comprises seven chapters. In the introduction chapter the field of Spatial Analysis is presented together with basic concepts, as well as the properties and organization of spatial data. The second chapter concerns data

collection and sampling methods. Apart from classical sampling methods, spatial sampling techniques are presented. The third chapter concerns data description with tables, graphs and maps. Several measures of central tendency and dispersion are explained together with measures of geographical distributions. The fourth chapter concerns probability distributions and statistical hypothesis tests, as a background for further analysis. The fifth chapter deals with correlation and regression analysis as well as basic methods of spatial statistics, such as measures of spatial autocorrelation and spatial regression models. In the sixth chapter three methods of multivariate analysis are presented; factor analysis, cluster analysis and discriminant analysis. The final chapter is about more recent trends in spatial analysis including geostatistical analysis, artificial intelligence and in general models in the field of GeoComputation. The book includes a large number of examples as well as videos explaining the use of statistical and GIS software.

