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Abstract

Multivariate data can arise in any field from agriculture to space shuttle. But the principles of multivariate statistical methods are valid, independent of the subject where the data come from. The statistical theory for today's multivariate techniques was developed well before the appearance of computers, but these techniques remained almost unknown outside the field of theoretical statistics until computational power became available to perform their increasingly complex calculation. Nowadays, people in field of medicine, marketing, biology, zoology etc, analysis their data themselves with the help of more user friendly software packages. Under this research project, we applied multivariate technique known as discriminant analysis to predict unknown species of a given *Puntius* specimen.

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Chapter 1

Introduction

1.1 Overview

One of the simplest conceptual definitions of multivariate statistics (MVS) is as a set of methods that deal with the simultaneous analysis of multiple response or dependent variables (DVs). This definition of MVS suggests an important relationship to univariate statistics (UVS) that may be considered a group of methods dealing with the analysis of a single DV. In fact, MVS not only exhibits similarities with UVS but can also be considered an extension of it, or conversely UVS can be viewed as a special case of MVS. At the same time, MVS and UVS have a number of distinctions [?].

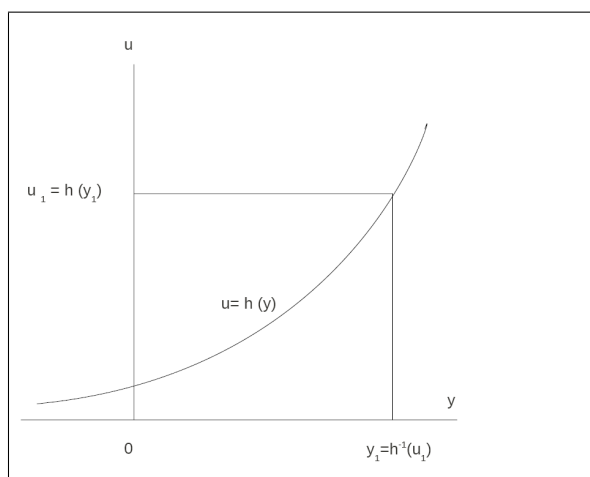


Figure 1.1 Normality for four groups.

Chapter 2

Multivariate Data

2.1 Univariate Random Variables

It is a common practice in many texts to use an uppercase letter for a variable name and the corresponding lowercase letter for a particular value or observed value of the random variable, for example, $P(Y > y)$. This notation is convenient in some univariate contexts, but it is often confusing in multivariate analysis, where we use uppercase letters for matrices. In the belief that it is easier to distinguish between a random vector and an observed value than between a vector and a matrix. Uppercase boldface letters are used for matrices of random variables or constants, lowercase boldface letters represent vectors of random variables or constants, and univariate random variables or constants are usually represented by lowercase non bolded letters. $ax + by + c = 0$

$$\lim_{x \rightarrow 0} f(x) = 0$$

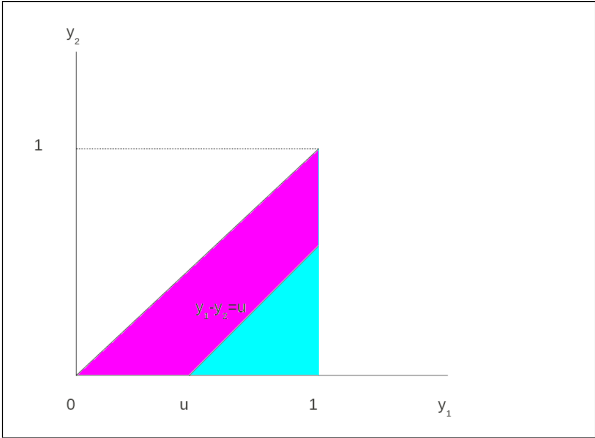


Figure 2.1 Visual inspection of multivariate normality for four groups.

$$|x| = \begin{cases} x & \text{if } x \geq 0 \\ -x & \text{if } x \leq 0 \end{cases}$$

$$ax + by + c = 0 \tag{2.1}$$

Planet	Diameter(km)
Mercury	4878
Pluto	2274

Chapter 3

Results

Chapter 4

Discussion and Conclusion

Appendix A

Java code

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