**8.10 R 语言应用**

**# 陈文贤 着 《大话统计学》 清华大学出版社 2022年**

if(!require(BSDA)) install.packages("BSDA") ; library(BSDA)

if(!require(devtools)){install.packages("devtools")} ; library(devtools)

if(!require(ggpubr)){install.packages("ggpubr")} ; library(ggpubr)

if(!require(EnvStats)) install.packages("EnvStats") ; library(EnvStats)

x1 <- c(155,143,146,147,142,145,145,152,144,147,155,148,149,147,149,146,

144,152,155,147,153,152,145,144,145,154,148,148,155,148,146,145,142,148,

146,151) # 例题8.4

z.test(x1,mu=150, sigma.x=3.88) # z 检验 x1 均值 = 150

varTest(x1, sigma.squared = 15) # 卡方检验 x1 方差 = 15

x2 <- c(844, 847, 845, 844) # 例题8.5

t.test(x2, mu = 846) # t 检验 x2 均值 = 846

x3 <- c(7.8, 6.6, 6.5, 7.4, 7.3, 7., 6.4, 7.1, 6.7, 7.6, 6.8)

shapiro.test(x3) # 检验 x3 是正态分布

ggqqplot(x3,ylab="x",ggtheme=theme\_minimal(),col="blue") # QQ plot

res <- t.test(x3,mu=7,alternative="greater") # 右侧 t 检验 x2 均值 = 7

res ; res$conf.int ; res$estimate ; res$p.value

varTest(x3, alternative = "two.sided", conf.level = 0.95,

sigma.squared = 0.2, data.name = NULL) # 卡方检验 x3 方差 = 0.2

# 例题8.6 Chap8\_6

binom.test(x=79, n=400, p = 0.25, alternative = "greater") # 二项检验比例

prop.test(x=79, n=400, p = 0.25, alternative="two.sided", correct=TRUE)

res <- prop.test(x=79,n=400,p=0.25,correct=F,alternative="less")

res ; res$conf.int # Z检验比例 与 比例值置信区间