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**课堂实验报告（三）**

**部 院 系： 知行书院**

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**1 绪论**

**1.1研究题目**

假设某林业经济单位要选择适当的树种来调整经济结构，树种选择考虑的因素包括四个方面：经济效益、生态效益、社会效益和技术要求，可选树种包括松树、杉木和桉树，请问应当怎样对供选树种进行优略排序？

**2 源码**

**2.1 main.py**

*# Title : GIS空间分析  
# Objective : AHP层次决策分析  
# Created by: jiangzongqing  
# Created on: 2021/3/25  
  
##输入：judgeMatrix 判断矩阵；round 结果约分位数*weight <- function (judgeMatrix, round=6) {  
 n = *ncol*(judgeMatrix)  
 *# cumProd <- vector(length=n)* cumProd <- *apply*(judgeMatrix, 1, prod) *##求每行连乘积* featureVectors <- cumProd^(1/n) *##开n次方(特征向量)* weight <- featureVectors/*sum*(featureVectors) *##求权重  
 round*(weight,round)  
}  
Detailed<- function (judgeMatrix, round=6) {  
 n = *ncol*(judgeMatrix)  
 *# cumProd <- vector(length=n)* cumProd <- *apply*(judgeMatrix, 1, prod) *##求每行连乘积* featureVectors <- cumProd^(1/n) *##开n次方(特征向量)* weight <- featureVectors/*sum*(featureVectors) *##求权重  
 print*(*round*(cumProd,round))  
 *print*(*round*(featureVectors,round))  
 *print*(*round*(weight,round))  
}  
*###注：CRtest调用了weight函数  
###输入：judgeMatrix  
###输出：CI, CR*CRtest <- function (judgeMatrix, round=6){  
 RI <- *c*(0, 0, 0.58, 0.9, 1.12, 1.24, 1.32, 1.41, 1.45, 1.49, 1.51) *#随机一致性指标* Wi <- *weight*(judgeMatrix) *##计算权重* n <- *length*(Wi)  
 if(n > 11){  
 *cat*("判断矩阵过大,请少于11个指标 \n")  
 }  
 if (n > 2) {  
 W <- *matrix*(Wi, ncol = 1)  
 judgeW <- judgeMatrix %\*% W  
 JudgeW <- *as.vector*(judgeW)  
 la\_max <- *sum*(JudgeW/Wi)/n  
 CI = (la\_max - n)/(n - 1)  
 CR = CI/RI[n]  
 *cat*("\n CI=", *round*(CI, round), "\n")  
 *cat*("\n CR=", *round*(CR, round), "\n")  
 if (CR <= 0.1) {  
 *cat*(" 通过一致性检验 \n")  
 *cat*("\n Wi: ", *round*(Wi, round), "\n")  
 }  
 else {  
 *cat*(" 请调整判断矩阵,使CR<0.1 \n")  
 Wi = NULL  
 }  
 }  
 else if (n <= 2) {  
 *return*(Wi)  
 }  
 consequence <- *c*(*round*(CI, round), *round*(CR, round))  
 *names*(consequence) <- *c*("CI", "CR")  
 consequence  
}  
en\_a<- function (judgeMatrix, round=6){  
 *eigen*(judgeMatix)  
}  
  
*#先列后行*a<-*c*(1,1/3,1/4,1/2,  
 3,1,2,2,  
 4,1/2,1,1/2,  
 2,1/2,2,1)  
*cat*("展示原始矩阵\n")  
(judgeMatix <- *matrix*(a, ncol=4,nrow=4))  
  
*##判断矩阵一致性检验  
cat*("计算乘积、开n次方、权重\n")  
*Detailed*(judgeMatix)  
*CRtest*(judgeMatix)  
*cat*("计算特征值，CI，CR\n")  
*en\_a*(judgeMatix)$values  
*#打分归一化#采用离差归一化的方式对打分数据归一化*Tree3<-function (judgeMatix,treeChoose,round=6){  
 b1=(treeChoose[,1]-*min*(treeChoose[,1]))/(*max*(treeChoose[,1])-*min*(treeChoose[,1]))  
 b2=(treeChoose[,2]-*min*(treeChoose[,2]))/(*max*(treeChoose[,2])-*min*(treeChoose[,2]))  
 b3=(treeChoose[,3]-*min*(treeChoose[,3]))/(*max*(treeChoose[,3])-*min*(treeChoose[,3]))  
 b4=(treeChoose[,4]-*min*(treeChoose[,4]))/(*max*(treeChoose[,4])-*min*(treeChoose[,4]))  
 data\_scatter=*cbind*(b1,b2,b3,b4)  
 *print*(data\_scatter)  
 *cat*("得分\n")  
 *cat*("松树: ")  
 *print*(*sum*(*weight*(judgeMatix)\*data\_scatter[1,]))  
 *cat*("衫树: ")  
 *print*(*sum*(*weight*(judgeMatix)\*data\_scatter[2,]))  
 *cat*("桉树: ")  
 *print*(*sum*(*weight*(judgeMatix)\*data\_scatter[3,]))  
}  
tree<-*c*(4,6,7,  
 1,3,8,  
 7,2,9,  
 10,1,3)  
(treeChoose <- *matrix*(tree, ncol=4,nrow=3))  
*cat*("计算经济效益，生态效益，社会效益，技术要求\n")  
*Tree3*(judgeMatix,treeChoose)

**3 运行结果**

**3.1**



