title: “Problem4.14” author: “Eder Beitia” date: “9/10/2021” output: html\_document

df<-expand.grid(c("A","B","C","D","E"),c(1,2,3,4,5))

df$Y<-c(8,11,4,6,4,7,2,9,8,2,1,7,10,6,3,7,3,1,6,8,3,8,5,10,8)

names(df)=c("Metodo","Operador","Y")

str(df)

df$Operador=factor(df$Operador)

modelo<-lm(Y~Metodo+Operador,data=df)

anova<-aov(modelo)

summary(anova)

LSD<-LSD.test(anova)

LSD

qqnorm(anova$residuals)

qqline(anova$residuals)

boxplot(Y~Metodo+Operador,data=df)

library(agricolae)

boxplot(Y~Operador,data=df, col="deepskyblue4")

boxplot(Y~Metodo,data=df, col="yellow4")

bar.group(x=LSD$groups,horiz=T,col="blue",xlim=c(0,9),

xlab="Tiempo de reacción",ylab="Método",main="Tiempo de reacción vs Método")

LSD<-LSD.test(anova,"Metodo",group=T,console=T)

title: “Problema4.15” author: “Eder Beitia” date: “9/10/2021” output: html\_document

df<-expand.grid(c("A","B","C","D"),c(1,2,3,4))

df$Y<-c(10,7,5,10,14,18,10,10,7,11,11,12,8,8,9,14)

names(df)=c("Metodo","ingeniero","Y")

str(df)

df$Operador=factor(df$ingeniero)

library(agricolae)

boxplot(Y~ingeniero,data=df, col="blanck")

boxplot(Y~Metodo,data=df, col="yellow4")

bar.group(x=LSD$groups,horiz=T,col="yellow",xlim=c(0,9),

xlab="orden de ensamblaje",ylab="Método",main="orden de ensamblaje vs Método")

title: “Proble4-22” author: “Eder Beitia” date: “9/10/2021” output: html\_document

library(agricolae)

str(design.lsd)

trt<-c("A","B","C","D", "E")

outdesign<-design.lsd(trt=trt,serie=2,seed=563)

print(outdesign$sketch)

names(outdesign$book)=c("COD","Marca","Prov","Tipo")

outdesign$book

i<-sample(1:16)

outdesign$book[i,]

df<-read.csv("https://docs.google.com/spreadsheets/d/1CQ8mikfk1dNIGyapkhQbZ74RfSCs0-cYVSHDFNdm9Kw/edit#gid=0/export?format=csv")

df

df$Lote=factor(df$Lote)

df$Dia=factor(df$Dia)

df$Trat=factor(df$Trat)

df$Y=as.numeric(df$Y)

df

modelo<-lm(Y~Lote+Dia+Trat,data=df)

anova=aov(modelo)

summary(anova)

qqnorm(anova$residuals)

qqline(anova$residuals)

shapiro.test(anova$residuals)

library(car)

leveneTest(df$Y~df$Trat)

boxplot(Y~Trat,data=df)

LSD<-LSD.test(anova,"Trat",group=T,console=T)

bar.group(x=LSD$groups,horiz=T,col="blue",xlim=c(0,9),

xlab="Catalizador",ylab="Método",main="Prueba de Catalizadores")

```{r}

plot(anova$residuals, col="red")

plot(df$Trat,anova$residuals)

str(design.graeco)

book=outdesign$book

book

t1<-c("$\\alpha$","$\\beta$","$\\gamma$","$\\delta$")

t2<-LETTERS[1:4]

i=outdesign$book$trt1

j=outdesign$book$trt2

book$trt1=sapply(i,function(i) t1[i])

book$trt2=sapply(j,function(j) t2[j])

knitr::kable(book, align = "lccc",caption = "Diseño de Cuadrado Latino")