**Analysis of LSD (latin square design)**

1. The following data yields zero wheat (kg/plot) as in an experiment carried out in a LSD. A, B, C, D, E are in 5 manual treatment carry out the analysis and comment on your findings.

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | B (57.8) | C (48.6) | A (33.4) | D (53.5) | E (41.8) | | D (50.8) | E (45.5) | C (51.8) | B (52.6) | A (31.9) | | A (46.1) | D (47.9) | B (55.6) | E (45.3) | C (53.3) | | C (58.2) | B (55.1) | E (43.2) | A (38.8) | D (53.3) | | E (53.0) | A (41.0) | D (48.7) | C (54.6) | B (55.7) | |

#1

wt=c(57.8,48.6,33.4,53.5,41.8,50.8,45.5,51.8,52.6,31.9,46.1,47.9,55.6,45.3,

53.3,58.2,55.1,43.2,38.8,53.3,53.0,41.0,48.7,54.6,55.7)

col=rep(c("C1","C2","C3","C4","C5"),5)

row=c(rep("R1",5), rep("R2",5), rep("R3",5),rep("R4",5),rep("R5",5))

treat=c('B','C','A','D','E',

'D','E','C','B','A',

'A','D','B','E','C',

'C','B','E','A','D',

'E','A','D','C','B')

mydata=data.frame(row,col,treat,wt)

LSD=aov(wt~row+col+treat,data=mydata)

summary(LSD)

F\_tab=qf(p=0.05, df1=3, df2=12, lower.tail=F)

F\_tab

#2

yield=c(12,19,10,8,18,12,6,7,22,10,5,21,12,7,27,17)

col=rep(c("C1","C2","C3","C4"),4)

row=c(rep("R1",4), rep("R2",4), rep("R3",4),rep("R4",4))

treat=c('A','C','B','D',

'C','B','D','A',

'B','D','A','C',

'D','A','C','B')

mydata=data.frame(row,col,treat,yield)

LSD=aov(yield~row+col+treat,data=mydata)

summary(LSD)

F\_tab=qf(p=0.05, df1=3, df2=6, lower.tail=F)

F\_tab

TukeyHSD(LSD, which = "treat")

m=4

Sr2=20.6

Sc2=14.23

Se2=13.23

#Efficiency of LSD over RBD when rows are blocks

E\_rows=(Sc2+m\*Se2)/((m+1)\*Se2)

E\_rows

#Efficiency of LSD over RBD when columns are blocks

E\_col=(Sr2+m\*Se2)/((m+1)\*Se2)

E\_col

#Efficiency of LSD over CRD

E=(Sr2+Sc2+(m-1)\*Se2)/((m+1)\*Se2)

E