library(lpSolve)

f.obj<- c(5,0,0,3,0,2,1,

0,5,3,0,2,1,0,

0,5,0,3,0,2,1,

3,0,5,0,2,1,0,

0,1,0,2,5,0,3,

3,0,2,5,0,0,1,

0,2,0,0,5,3,1,

5,0,3,1,0,2,0,

3,0,5,0,1,2,0,

0,0,0,5,3,1,2,

3,0,5,0,0,1,2,

1,0,5,3,0,2,0,

1,0,2,0,0,3,5,

1,0,2,5,0,3,0,

5,0,3,0,2,1,0,

1,2,0,0,0,3,5,

1,0,0,5,0,3,2,

2,0,1,0,3,5,0,

5,1,3,2,0,0,0,

5,0,3,1,0,2,0,

0,5,1,3,0,0,2)

f.obj

length(f.obj)

mat1<- matrix(0, nrow=21,ncol=length(f.obj))

mat1

dim(mat1)

for(i in 1:21){

mat1[i, c(7\*i-6, 7\*i-5, 7\*i-4, 7\*i-3, 7\*i-2, 7\*i-1, 7\*i)]<- 1

}

mat1

f.dir1<- rep("==", 21)

f.dir1

f.rhs1<- c(rep(2, 21))

f.rhs

mat2<- matrix(0, nrow=7, ncol= length(f.obj))

mat2

dim(mat2)

for(i in 1:7){

mat2[i,c(i, i+7, i+14, i+21, i+28, i+35, i+42, i+49, i+56, i+63, i+70, i+77, i+84,

i+91, i+98, i+105, i+112, i+119, i+126, i+133, i+140 )]<- 1

}

mat2

dim(mat2)

f.dir2<- rep(">=",7)

f.dir2

f.rhs2<- c(rep(2, 7))

f.rhs2

mat3<- matrix(0, nrow=7, ncol= length(f.obj))

mat3

dim(mat3)

for(i in 1:7){

mat3[i,c(i, i+7, i+14, i+21, i+28, i+35, i+42, i+49, i+56, i+63, i+70, i+77, i+84,

i+91, i+98, i+105, i+112, i+119, i+126, i+133, i+140 )]<- 1

}

mat3

dim(mat3)

f.dir3<- rep("<=",7)

f.rhs3<- c(rep(6, 7))

f.rhs3

#binding all constraints

f.con<- rbind(mat1, mat2, mat3)

f.rhs<- c(f.rhs1, f.rhs2, f.rhs3)

f.dir<- c(f.dir1, f.dir2, f.dir3)

answer<- lp("max", f.obj, f.con, f.dir, f.rhs, all.bin = TRUE)

answer

library(lpSolve)

f.obj<- c(5,0,0,3,0,2,1,

0,5,3,0,2,1,0,

0,5,0,3,0,2,1,

3,0,5,0,2,1,0,

0,1,0,2,5,0,3,

3,0,2,5,0,0,1,

0,2,0,0,5,3,1,

5,0,3,1,0,2,0,

3,0,5,0,1,2,0,

0,0,0,5,3,1,2,

3,0,5,0,0,1,2,

1,0,5,3,0,2,0,

1,0,2,0,0,3,5,

1,0,2,5,0,3,0,

5,0,3,0,2,1,0,

1,2,0,0,0,3,5,

1,0,0,5,0,3,2,

2,0,1,0,3,5,0,

5,1,3,2,0,0,0,

5,0,3,1,0,2,0,

0,5,1,3,0,0,2)

f.obj

length(f.obj)

mat1<- matrix(0, nrow=21,ncol=length(f.obj))

mat1

dim(mat1)

for(i in 1:21){

mat1[i, c(7\*i-6, 7\*i-5, 7\*i-4, 7\*i-3, 7\*i-2, 7\*i-1, 7\*i)]<- 1

}

mat1

f.dir1<- rep("==", 21)

f.dir1

f.rhs1<- c(rep(2, 21))

f.rhs

mat2<- matrix(0, nrow=7, ncol= length(f.obj))

mat2

dim(mat2)

for(i in 1:7){

mat2[i,c(i, i+7, i+14, i+21, i+28, i+35, i+42, i+49, i+56, i+63, i+70, i+77, i+84,

i+91, i+98, i+105, i+112, i+119, i+126, i+133, i+140 )]<- 1

}

mat2

dim(mat2)

f.dir2<- rep(">=",7)

f.dir2

f.rhs2<- c(rep(6, 7))

f.rhs2

mat3<- matrix(0, nrow=7, ncol= length(f.obj))

mat3

dim(mat3)

for(i in 1:7){

mat3[i,c(i, i+7, i+14, i+21, i+28, i+35, i+42, i+49, i+56, i+63, i+70, i+77, i+84,

i+91, i+98, i+105, i+112, i+119, i+126, i+133, i+140 )]<- 1

}

mat3

dim(mat3)

f.dir3<- rep("<=",7)

f.rhs3<- c(rep(7, 7))

f.rhs3

#binding all constraints

f.con<- rbind(mat1, mat2, mat3)

f.rhs<- c(f.rhs1, f.rhs2, f.rhs3)

f.dir<- c(f.dir1, f.dir2, f.dir3)

answer<- lp("max", f.obj, f.con, f.dir, f.rhs, all.bin = TRUE)

answer