Assignment 4

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##1

```
library(lpSolveAPI)
lpec1<-make.lp(0,8)
set.objfn(lpec1,c(22,14,30,16,20,24,600,625))
```

add constraints

```
add.constraint(lpec1,c(1,1,1,0,0,0,-1,0),"=",0)
add.constraint(lpec1,c(0,0,0,1,1,1,0,-1),"=",0)
add.constraint(lpec1,c(1,0,0,1,0,0,0,0),"=",80)
add.constraint(lpec1,c(0,1,0,0,1,0,0,0),"=",60)
add.constraint(lpec1,c(0,0,1,0,0,1,0,0),"=",70)
add.constraint(lpec1,c(0,0,0,0,0,0,1,0),"<=",100)
add.constraint(lpec1,c(0,0,0,0,0,0,0,1),"<=",120)
Colnames<-c("X11","X12","X13","X21","X22","X23","X1","X2")
Rownames<-c("c1","c2","c3","c4","c5","c6","c7")
dimnames(lpec1)<-list(Rownames,Colnames)
```

#Solution

```
write.lp(lpec1,filename = "PrimalAssignment4.lp",type = "lp")
solve(lpec1)
```

```
## [1] 0
```

```
get.objective(lpec1)
```

```
## [1] 132790
```

```
get.variables(lpec1)
```

```
## [1]  40  60   0  40   0  70 100 110
```

Plant A will produce 100 units and Plant B will produce 110 units. Plant A will transport 40 units to Warehouse 1 and 60units to Warehouse 2. Plant B will transport 40 units to Warehouse 1 and 70 units to Warehouse 2.

##2

```
lpec2<-make.lp(0,24)
set.objfn(lpec2,c(1.52,1.60,1.40,1.70,1.63,1.55,1.45,1.57,1.30,5.15,5.69,6.13,5.64,5.80,5.12,5.47,6.05,6.12,5.71,5.32,6.16,6.25,6.17,5.87))
```

add constraints

```
add.constraint(lpec2,c(1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0),
"<=",93)
add.constraint(lpec2,c(0,0,0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0),
"<=",88)
add.constraint(lpec2,c(0,0,0,0,0,0,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0),
"<=",95)
add.constraint(lpec2,c(0,0,0,0,0,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0),
"=",30)
add.constraint(lpec2,c(0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0),
"=",57)
add.constraint(lpec2,c(0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0),
"=",48)
add.constraint(lpec2,c(0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0),
"=",91)
add.constraint(lpec2,c(0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1),
"=",48)
add.constraint(lpec2,c(1,0,0,1,0,0,1,0,0,-1,-1,-1,-1,-1,0,0,0,0,0,0,0,0,
0,0),"=",0)
add.constraint(lpec2,c(0,1,0,0,1,0,0,1,0,0,0,0,0,0,-1,-1,-1,-1,-1,0,0,0,
0,0),"=",0)
add.constraint(lpec2,c(0,0,1,0,0,1,0,0,1,0,0,0,0,0,0,0,0,0,0,-1,-1,-1,-
1,-1),"=",0)
Colnames2<-c("X1A","X1B","X1C","X2A","X2B","X2C","X3A","X3B","X3C","XA1
","XA2","XA3","XA4","XA5","XB1","XB2","XB3","XB4","XB5","XC1","XC2","XC
3","XC4","XC5")
Rownames2<-c("c1","c2","c3","c4","c5","c6","c7","C8","C9","C10","C11")
dimnames(lpec2)<-list(Rownames2,Colnames2)
```

#Solution

```
write.lp(lpec2,filename = "PrimalAssignment4(2).lp",type = "lp")
solve(lpec2)
```

[1] 0

```
get.objective(lpec2)
```

[1] 1964.73

```
get.variables(lpec2)
```

[1] 93 0 0 0 86 0 28 0 67 30 0 0 91 0 0 57 29 0 0 0 0
19 0 48

The min cost is 1964.73. The variables is X1A=93 X2B=86 X1C=28 X3C=67 XA1=30 XA4=91 XB2=57 XB3=29 XC3=19 XC5=48