QMM Assignment2.R

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getwd()

## [1] "/Users/ribakhan/Desktop"

#Solution to the problem :  
#install packages  
install.packages("lpSolve")

## Error in install.packages : Updating loaded packages

#library  
library(lpSolve)  
  
#objectve function is to maximize Z = 420L1 + 360M1 + 300S1 + 420L2 + 360M2 + 300S2 + 420L3 + 360M3 + 300S3  
f.obj<-c(420,360,300,420,360,300,420,360,300)  
  
#Subject to  
#L1 + M1 + S1 ≤ 750  
#L2 + M2 + S2 ≤ 900  
#L3 + M3 + S3 ≤ 450  
#20L1 + 15M1 + 12S1 ≤ 13000  
#20L2 + 15M2 + 12S2 ≤ 12000  
#20L3 + 15M3 + 12S3 ≤ 5000  
#L1 + L2 + L3 ≤ 900  
#M1 + M2 + M3 ≤ 1200  
#S1 + S2 + S3 ≤ 750  
  
#now wiriting the constraints  
f.con <-matrix(c(1,1,1,0,0,0,0,0,0,  
 0,0,0,1,1,1,0,0,0,  
 0,0,0,0,0,0,1,1,1,  
 20,15,12,0,0,0,0,0,0,  
 0,0,0,20,15,12,0,0,0,  
 0,0,0,0,0,0,20,15,12,  
 1,0,0,1,0,0,1,0,0,  
 0,1,0,0,1,0,0,1,0,  
 0,0,1,0,0,1,0,0,1), nrow = 9, byrow = TRUE)  
  
# set the direction of the inequalities (using subject to equation for this)  
f.dir <-c("<=",  
 "<=",  
 "<=",  
 "<=",  
 "<=",  
 "<=",   
 "<=",  
 "<=",  
 "<=")  
  
#set the right hand side of the coefficients  
  
f.rhs <-c(750,  
 900,  
 450,  
 13000,  
 12000,  
 5000,  
 900,  
 1200,  
 750)  
  
#find the value of the objective function  
lp("max", f.obj, f.con, f.dir, f.rhs)

## Success: the objective function is 708000

##The answer to the solution is 708000.

*#Variables final Values*

lp("max", f.obj, f.con, f.dir, f.rhs)$solution

[1] 350.0000 400.0000 0.0000 0.0000 400.0000 500.0000 0.0000 133.3333 250.0000

##The answer to the solution is 708000.