Quantitative Assignment2

Modelling a Linear Program

#install.packages("lpSolveAPI")  
library(lpSolveAPI)  
b <- make.lp(0,9,verbose = "neutral")  
b

## Model name:   
## a linear program with 9 decision variables and 0 constraints

# Adding Constraints  
add.constraint(b, c(1,1,1,0,0,0,0,0,0), "<=", 750 )  
add.constraint(b, c(0,0,0,1,1,1,0,0,0), "<=", 900)  
add.constraint(b, c(0,0,0,0,0,0,1,1,1), "<=", 450)  
add.constraint(b, c(20,15,12,0,0,0,0,0,0), "<=", 13000)  
add.constraint(b, c(0,0,0,20,15,12,0,0,0), "<=", 12000)  
add.constraint(b, c(0,0,0,0,0,0,20,15,12), "<=", 5000)  
add.constraint(b, c(1,1,1,0,0,0,0,0,0), "<=", 900)  
add.constraint(b, c(0,0,0,1,1,1,0,0,0), "<=", 1200)  
add.constraint(b, c(0,0,0,0,0,0,1,1,1), "<=", 750)  
add.constraint(b, c(6, 6, 6, -5, -5, -5, 0, 0, 0), "=", 0)  
add.constraint(b, c( 3, 3, 3, 0, 0, 0, -5, -5, -5), "=", 0)  
  
# Setting the Objective Function  
set.objfn(b, c(420,360,300,420,360,300,420,360,300))  
lp.control(b, sense='max')

## $anti.degen  
## [1] "none"  
##   
## $basis.crash  
## [1] "none"  
##   
## $bb.depthlimit  
## [1] -50  
##   
## $bb.floorfirst  
## [1] "automatic"  
##   
## $bb.rule  
## [1] "pseudononint" "greedy" "dynamic" "rcostfixing"   
##   
## $break.at.first  
## [1] FALSE  
##   
## $break.at.value  
## [1] 1e+30  
##   
## $epsilon  
## epsb epsd epsel epsint epsperturb epspivot   
## 1e-10 1e-09 1e-12 1e-07 1e-05 2e-07   
##   
## $improve  
## [1] "dualfeas" "thetagap"  
##   
## $infinite  
## [1] 1e+30  
##   
## $maxpivot  
## [1] 250  
##   
## $mip.gap  
## absolute relative   
## 1e-11 1e-11   
##   
## $negrange  
## [1] -1e+06  
##   
## $obj.in.basis  
## [1] TRUE  
##   
## $pivoting  
## [1] "devex" "adaptive"  
##   
## $presolve  
## [1] "none"  
##   
## $scalelimit  
## [1] 5  
##   
## $scaling  
## [1] "geometric" "equilibrate" "integers"   
##   
## $sense  
## [1] "maximize"  
##   
## $simplextype  
## [1] "dual" "primal"  
##   
## $timeout  
## [1] 0  
##   
## $verbose  
## [1] "neutral"

b.col <- c("P 1","P 2","P 3","p 4","p 5","p 6","p 7","p 8","p 9")   
b.row <- c("Y1l","Y1m","Y1s","Y2l", "Y2m","Y2s","Y3l","Y3m","Y3s","%C1","%C2")   
dimnames(b) <- list(b.row,b.col)  
b

## Model name:   
## a linear program with 9 decision variables and 11 constraints

solve(b)

## [1] 0

get.objective(b)

## [1] 696000

get.variables(b)

## [1] 516.6667 177.7778 0.0000 0.0000 666.6667 166.6667 0.0000 0.0000  
## [9] 416.6667