Q6 Final Exam Modeling

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library(lpSolveAPI)

## Warning: package 'lpSolveAPI' was built under R version 3.6.2

library (dplyr)

## Warning: package 'dplyr' was built under R version 3.6.3

##   
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':  
##   
## filter, lag

## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

lp=make.lp(0,4)

lp.control(lp,sense="max")

## $anti.degen  
## [1] "fixedvars" "stalling"   
##   
## $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"

set.objfn(lp,c(75,60,200,100))

add.constraint(lp,c(10,10,20,20), "<=", 1500)

add.constraint(lp,c(5,5,7,7),"<=", 2000)

set.bounds(lp, upper=25, columns=1)

set.bounds(lp, upper=50, columns=3)

lp

## Model name:   
## C1 C2 C3 C4   
## Maximize 75 60 200 100   
## R1 10 10 20 20 <= 1500  
## R2 5 5 7 7 <= 2000  
## Kind Std Std Std Std   
## Type Real Real Real Real   
## Upper 25 Inf 50 Inf   
## Lower 0 0 0 0

solve(lp)

## [1] 0

get.objective(lp)

## [1] 13375

get.variables(lp)

## [1] 25 25 50 0

get.constraints(lp)

## [1] 1500 600