

Assignment 4

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Load library

```
library(lpSolveAPI)
```

```
## Warning: package 'lpSolveAPI' was built under R version 4.0.3
```

9 decision variables

```
lprec <- make.lp(0,9)
## Define objective function
set.objfn(lprec, c(420,420,420,360,360,360,300,300,300))
## We are interested in maximizing profit
lp.control(lprec,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"

```

Define all constraints

```

add.constraint(lprec, c(1,1,1,0,0,0,0,0,0), "<=", 900)
add.constraint(lprec, c(0,0,0,1,1,1,0,0,0), "<=", 1200)
add.constraint(lprec, c(0,0,0,0,0,0,1,1,1), "<=", 750)
add.constraint(lprec, c(1,0,0,1,0,0,1,0,0), "<=", 750)
add.constraint(lprec, c(0,1,0,0,1,0,0,1,0), "<=", 900)
add.constraint(lprec, c(0,0,1,0,0,1,0,0,1), "<=", 450)
add.constraint(lprec, c(20,0,0,15,0,0,12,0,0), "<=", 13000)
add.constraint(lprec, c(0,20,0,0,15,0,0,12,0), "<=", 12000)

```

```

add.constraint(lprec, c(0,0,20,0,0,15,0,0,12), "<=", 5000)
add.constraint(lprec, c(6,-5,0,6,-5,0,6,-5,0), "=", 0)
add.constraint(lprec, c(0,1,-2,0,1,-2,0,1,-2), "=", 0)
add.constraint(lprec, c(-3,0,5,-3,0,5,-3,0,5), "=", 0)

```

```

## Print out the model
lprec

```

```

## Model name:
##   a linear program with 9 decision variables and 12 constraints

```

```

## Save it into a file
write.lp(lprec, filename = "Assignment4.lp", type = "lp")
## Solve the model
solve(lprec)

```

```

## [1] 0

```

```

get.objective(lprec)

```

```

## [1] 696000

```

```

get.variables(lprec)

```

```

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

```