mchris26_2

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```
#install.packages("lpSolveAPI")
```

Now, load the library

```
library(lpSolveAPI)
```

---

two decision variables and three constraints create the objective function and constraints lp object with 0 constraints and 9 decision variables

```
lprec <- make.lp(nrow=0, ncol=9)
set.objfn(lprec, c(420, 360, 300, 420, 360, 300, 420, 360, 300))
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"
```

```
add.constraint(lprec, c(1, 1, 1,0,0,0,0,0,0), "<=", 750)
add.constraint(lprec, c(0,0,0,1, 1, 1,0,0,0), "<=", 900)
add.constraint(lprec, c(0,0,0,0,0,0,1, 1, 1), "<=", 450)
add.constraint(lprec, c(20,15,12,0,0,0,0,0,0), "<=", 13000)
add.constraint(lprec, c(0,0,0,20,15,12,0, 0, 0), "<=", 12000)
add.constraint(lprec, c(0,0,0,0,0,0,20, 15, 12), "<=", 5000)
add.constraint(lprec, c(1,0,0,1,0,0,1, 0, 0), "<=", 900)
add.constraint(lprec, c(0,1,0,0,1,0,0, 1, 0), "<=", 1200)
add.constraint(lprec, c(0,0,1,0,0,1,0, 0, 1), "<=", 750)
set.bounds(lprec, lower = c(0, 0), columns = c(1, 9))
RowNames <- c("Cap1", "cap2", "cap3", "space1","space2","space3", "sale1","sale2","sale3")
```

```
ColNames <- c("L1", "M1","S1","L2", "M2","S2","L3", "M3","S3")
dimnames(lprec) <- list(RowNames, ColNames)

lprec
```

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

Solving the LP model here

```
solve(lprec)
```

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

outputing the value of the objective function and variables

```
get.objective(lprec)
```

```
## [1] 708000
```

```
get.variables(lprec)
```

```
## [1] 350.0000 400.0000   0.0000   0.0000 400.0000 500.0000   0.0000 133.3333
## [9] 250.0000
```

```
get.constraints(lprec)
```

```
## [1]   750.0000   900.0000   383.3333 13000.0000 12000.0000  5000.0000   350.0000
## [8]   933.3333   750.0000
```