811128289_R2_4

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loading the library

```
library(lpSolveAPI)
```

formulating the linear program and setting the function to minimize

```
lprec<-make.lp(0,27)
lp.control(lprec,sense='min')
```

```
## $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] "minimize"
##
## $simplextype
## [1] "dual"   "primal"
##
## $timeout
## [1] 0
##
## $verbose
## [1] "neutral"
```

setting the objective function

```
set.objfn(lprec,c(1.52,1.60,1.40,1.70,1.63,1.55,1.45,1.57,1.30,5.15,5.12,5.32
,5.69,5.47,6.16,6.13,6.05,6.25,5.63,6.12,6.17,5.80,5.71,5.87,0,0,0))
```

adding constraints for wells, refineries and pumps

```
add.constraint(lprec,c(1,1,1),"=",93,indices = c(1,2,3))
add.constraint(lprec,c(1,1,1),"=",88,indices = c(4,5,6))
add.constraint(lprec,c(1,1,1),"=",95,indices = c(7,8,9))
add.constraint(lprec,c(1,1,1),"=",30,indices = c(10,11,12))
add.constraint(lprec,c(1,1,1),"=",57,indices = c(13,14,15))
add.constraint(lprec,c(1,1,1),"=",48,indices = c(16,17,18))
add.constraint(lprec,c(1,1,1),"=",91,indices = c(19,20,21))
add.constraint(lprec,c(1,1,1),"=",48,indices = c(22,23,24))
add.constraint(lprec,c(1,1,1),"=",2,indices = c(25,26,27))
```

```
add.constraint(lprec,c(rep(1,3),rep(-
1,6)),"=",0,indices=c(1,4,7,10,13,16,19,22,25))
add.constraint(lprec,c(rep(1,3),rep(-
1,6)),"=",0,indices=c(2,5,8,11,14,17,20,23,26))
add.constraint(lprec,c(rep(1,3),rep(-
1,6)),"=",0,indices=c(3,6,9,12,15,18,21,24,27))
```

solving the lp problem.

```
solve(lprec)

## [1] 0

get.objective(lprec)

## [1] 1966.68

get.constraints(lprec)

##  [1] 93 88 95 30 57 48 91 48  2  0  0  0

get.variables(lprec)

##  [1] 93  0  0  0 88  0 28  0 67 30  0  0  0 57  0  0 31 17 91  0  0  0  0
48  0
## [26]  0  2
```