MSDS460HW2.R

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```
library (lpSolve)
```

```
## Warning: package 'lpSolve' was built under R version 3.5.3
```

```
# I'm looking for 25 bonus points
# Created by Alisher Siddikov

########################
# problem part 1
# maximize students
########################

## Objective: AS_TX +   AS_CA + AS_DC + AS_NY + COL_TX + COL_CA + COL_DC + COL_NY

## Constraints:
## AS_TX +  AS_CA + AS_DC + AS_NY >= 1000
## COL_TX + COL_CA + COL_DC + COL_NY >= 1400
## AS_TX <= 750
## AS_CA <= 650
## AS_DC <= 300
## AS_NY <= 800
## COL_TX <= 750
## COL_CA <= 650
## COL_DC <= 300
## COL_NY <= 800
##


# defining parameters

obj.fun <- c(1, 1, 1, 1, 1, 1, 1, 1)
constr <- matrix (c(1, 1, 1, 1, 0, 0, 0, 0,
                    0, 0, 0, 0, 1, 1, 1, 1,
                    1, 0, 0, 0, 1, 0, 0, 0,
                    0, 1, 0, 0, 0, 1, 0, 0,
                    0, 0, 1, 0, 0, 0, 1, 0,
                    0, 0, 0, 1, 0, 0, 0, 1), ncol = 8, byrow =TRUE)
constr
```

```
##      [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8]
## [1,]    1    1    1    1    0    0    0    0
## [2,]    0    0    0    0    1    1    1    1
## [3,]    1    0    0    0    1    0    0    0
## [4,]    0    1    0    0    0    1    0    0
## [5,]    0    0    1    0    0    0    1    0
## [6,]    0    0    0    1    0    0    0    1
```

```r
constr.dir <- c(">=", ">=", "<=", "<=", "<=", "<=")
rhs <- c(1000, 1400, 750, 650, 300, 800)

# solving model
prod.sol <- lp(direction = "max", obj.fun, constr, constr.dir, rhs, compute.sens = TRUE)

# answers
prod.sol # objective function
```

```
## Success: the objective function is 2500
```

```r
prod.sol$solution # maximized numbers
```

```
## [1]   0   0 300 800 750 650   0   0
```

```r
########################
# problem part 2
# minimize cost
########################

obj.fun2 <- c(3000, 2500, 5000, 4000, 4500, 4000, 1500, 2000)

# solving model
prod.sol2 <- lp(direction = "min", obj.fun2, constr, constr.dir, rhs, compute.sens = TRUE)

# answers
prod.sol2 # objective function
```

```
## Success: the objective function is 6075000
```

```r
prod.sol2$solution # minimized numbers
```

```
## [1] 650 350   0   0   0 300 300 800
```