ahaffne2\_11.ext

library(lpSolve)  
library(lpSolveAPI)  
  
  
x <- read.lp("/Users/alexhaffner/Desktop/11.lp")  
x

## Model name:   
## x1 x2 x3 x4 x5 x6 x7   
## Minimize 775 800 800 800 800 775 750   
## R1 0 1 1 1 1 1 0 >= 18  
## R2 0 0 1 1 1 1 1 >= 27  
## R3 1 0 0 1 1 1 1 >= 22  
## R4 1 1 0 0 1 1 1 >= 26  
## R5 1 1 1 0 0 1 1 >= 25  
## R6 1 1 1 1 0 0 1 >= 21  
## R7 1 1 1 1 1 0 0 >= 19  
## Kind Std Std Std Std Std Std Std   
## Type Int Int Int Int Int Int Int   
## Upper Inf Inf Inf Inf Inf Inf Inf   
## Lower 0 0 0 0 0 0 0

solve(x)

## [1] 0

get.objective(x)

## [1] 25675

The total cost of the minimal wage expense is $25,675.

get.variables(x)

## [1] 2 4 5 0 8 1 13

tab <- matrix(c(0,4,5,0,8,1,0,0,0,5,0,8,1,13,2,0,0,0,8,1,13,2,4,0,0,8,1,13,2,4,5,0,0,1,13,2,3,4,0,0,0,13,2,4,5,0,8,0,0), ncol=7,byrow=TRUE)  
colnames(tab)<- c('Sun/Mon', 'Mon/Tue','Tue/Wed', 'Wed/Thur', 'Thur/Fri', 'Fri/Sat', 'Sat/Sun')  
row.names(tab) <- c('Sunday', 'Monday', 'Tuesday','Wednesda','Thursday','Friday','Saturday')  
tab

## Sun/Mon Mon/Tue Tue/Wed Wed/Thur Thur/Fri Fri/Sat Sat/Sun  
## Sunday 0 4 5 0 8 1 0  
## Monday 0 0 5 0 8 1 13  
## Tuesday 2 0 0 0 8 1 13  
## Wednesda 2 4 0 0 8 1 13  
## Thursday 2 4 5 0 0 1 13  
## Friday 2 3 4 0 0 0 13  
## Saturday 2 4 5 0 8 0 0

Using the variables from the lp model, I inserted them into the schedule to find the optimal solution that minimizes the total wage expense.

rowSums(tab)

## Sunday Monday Tuesday Wednesda Thursday Friday Saturday   
## 18 27 24 28 25 22 19

This table shows the number of employees available each day using the shift schedule the has that minimizes the total wage expense.