# QMM Assignment 6

## Hanish Bhogadi

### 2022-11-21

```
library(lpSolve)
## Warning: package 'lpSolve' was built under R version 4.1.3
library(lpSolveAPI)
## Warning: package 'lpSolveAPI' was built under R version 4.1.3
x<- read.lp("/Users/Hanish Bhogadi/Downloads/ap.lp")</pre>
## Model name:
##
                x2
                      xЗ
                           x4
                               x5
                                    x6
                                        x7
            x1
           775 800 800
## Minimize
                          800
                                   775
                                        750
             0
## Sunday
                                          0
                                                18
                 1
                      1
                            1
                                1
                                     1
## Monday
              0
                                                27
## Tuesday
                0
                     0
                                                22
              1
                          1
                              1
## Wednesday
                1
## Thursday
             1
                  1 1
                            0
                                0
                                            >= 25
                                          1
## Friday
              1
                  1
                                          1 >=
                                1
## Saturday
                     1
                            1
                                          0 >= 19
             1
                  1
## 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
solve(x)
## [1] 0
get.objective(x)
```

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

## [1] 25675

### get.variables(x)

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

##		${\tt Sun/Mon}$	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
##	${\tt Wednesda}$	2	4	0	0	8	1	13
##	${\tt Thursday}$	2	4	5	0	0	1	13
##	Friday	2	3	4	0	0	0	13
##	${\tt Saturday}$	2	4	5	0	8	0	0

Using the variables from the lp model, To find the optimal solution, I inserted the variables into the schedule as it minimizes the total wage expense.

#### rowSums(table1)

##	Sunday	Monday	Tuesday	${\tt Wednesda}$	Thursday	Friday	Saturday
##	18	27	24	28	25	22	19

Using the shift schedule, this table shows the number of employees available each day that minimizes the total wage expense.