QMM #6

AP shipping company's problem formulation:

// Objective function min: 775x1 + 800x2 + 800x3 + 800x4 + 800x5 + 775x6 + 750x7;

// Constraints Sunday number of workers Constraint: x2 + x3 + x4 + x5 + x6 >= 18; Monday number of workers Constraint: x3 + x4 + x5 + x6 + x7 >= 27; Tuesday number of workers constraint: x1 + x4 + x5 + x6 + x7 >= 22; Wednesday number of workers constraint: x1 + x2 + x5 + x6 + x7 >= 26; Thursday number of workers constraint: x1 + x2 + x3 + x6 + x7 >= 25; Friday number of workers constraint: x1 + x2 + x3 + x4 + x7 >= 21; Saturday number of workers constraint: x1 + x2 + x3 + x4 + x5 >= 19;

integers x1, x2, x3, x4, x5 , x6, x7;

```
library(lpSolveAPI)

y <- read.lp("Apshipping.lp")
y
```

```
## 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(y) #Optimal solution found
```

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

What was the total cost? How many workers are available each day?

```
get.objective(y)  #The minimum wage expense is $25,675
```

```
## [1] 25675
```

```
get.variables(y)  #Number of workers on Sunday is 19, Monday: 27,  Tuesday :24, Wednesday: 28, Thursday
```

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