

QMM assignment

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```
library(lpSolve)
library(lpSolveAPI)
```

#Where #P = total (discounted) profit over the life of the new products, the objective function #Maximize
 $Z = P - 6C - 3D$, #C = Change (in either direction) in the level of employment at the moment, and #D =
Decrease (if any) in earnings from the level of the present year in the following year.

```
tab<- matrix(c("Total Profit", "Employment Level", "Earnings Next Year",
               20,6,8,
               15,4,7,
               25,5,5,
               "Maximize", "=50", ">=75",
               "Millions of Dollars", "Hundreds of Employees", "Millions of Dollars"), ncol=6, byrow=T)
colnames(tab) <- c("Factor", "P 1", "P 2", "P 3", "Goal", "Units")
as.table(tab)
```

##	Factor	P 1	P 2	P 3	Goal	Units
## A	Total Profit	20	15	25	Maximize	Millions of Dollars
## B	Employment Level	6	4	5	=50	Hundreds of Employees
## C	Earnings Next Year	8	7	5	>=75	Millions of Dollars

The formulations used for the objective function and constraints to the lp formulation are as follows:

#Maximum objective function: $20x_1, 15x_2$, and $25x_3 - 6y_1m, 6y_1p$, and $3y_2m$;

#Constraints $\#6x_1 + 4x_2 + 5x_3 + y_1m - y_1p = 50$; $\#8x_1 + 7x_2 + 5x_3 + y_2m - y_2p = 75$;

```
getwd()
```

```
## [1] "C:/Users/Hello/Downloads"
```

```
data<-read.lp("C:/Users/Hello/Downloads/Emx-corporo.lp")
data
```

```
## Model name:
##           x1    x2    x3   y1d   y1u   y2d   y2u
## Maximize   20    15    25    -6    -6    -3     0
```

```
## R1      6      4      5      1     -1      0      0 = 50
## R2      8      7      5      0      0      1     -1 = 75
## Kind    Std    Std    Std    Std    Std    Std    Std
## Type    Real   Real   Real   Real   Real   Real   Real
## Upper   Inf    Inf    Inf    Inf    Inf    Inf    Inf
## Lower    0      0      0      0      0      0      0
```

```
#Goal programming model
```

```
solve(data)
```

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

```
#The result of the formulation of lp is 0, which indicates bsuccess.
```

maximizing profit.

```
get.objective(data)
```

```
## [1] 225
```

```
#Variable value of goal programming model
```

```
get.variables(data)
```

```
## [1] 0 0 15 0 25 0 0
```

#interpretation #1.From above, it is clear that X3 has experienced a metamorphosis, which is The sole product the business can produce, 15 units of Product 3, will yield the highest profit.

#2. The firm's employment levels were exceeded by 250 employees even though the permitted cap was 50 hundred, in accordance with the limitations mentioned above.

#3. Y2P and Y2M sought to identify any variations in profits for the next year. It showed no variations from the given formulation.