ASSIGNMENT-integer programming

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library("lpSolveAPI")

```
AP_HUB = read.lp("C:/Users/kurra/Downloads/ap_hub.lp")
```

```
## Error in read.lp("C:/Users/kurra/Downloads/ap_hub.lp"): could not find function "read.lp"
```

```
AP_HUB
```

```
## Error in eval(expr, envir, enclos): object 'AP_HUB' not found
```

an estimate of the number of workers needed each day of the week has given in the below table.

```
workers_day_wise = matrix(c("sunday","monday","tuesday","wednesday","thursday","friday","saturday", 18,2
```

```
colnames(workers_day_wise) = c("Day_of_the_week", "Workers_Required")
workers_day_wise
```

```
##       Day_of_the_week Workers_Required
## [1,] "sunday"         "18"
## [2,] "monday"         "27"
## [3,] "tuesday"        "22"
## [4,] "wednesday"      "26"
## [5,] "thursday"       "25"
## [6,] "friday"         "21"
## [7,] "saturday"       "19"
```

```
as.table(workers_day_wise)
```

```
##   Day_of_the_week Workers_Required
## A sunday          18
## B monday          27
## C tuesday         22
## D wednesday       26
## E thursday        25
## F friday          21
## G saturday        19
```

Package handlers at AP are guaranteed a five-day work week with two consecutive days off. The base wage for the handlers is $750 per week. Workers working on Saturday or Sunday receive an additional $25 per day. The possible shifts and salaries for package handlers are:

```r
Day_offs_and_wages = matrix(c(1,2,3,4,5,6,7,
                              "Sunday and Monday","Monday and Tuesday","Tuesday and Wednesday","Wednesd
                              "$775","$800","$800","$800","$800","$775","$750"),ncol=3,byrow=F)

colnames(Day_offs_and_wages)= c("shifts","day_offs","wages")
Day_offs_and_wages
```

```
##      shifts day_offs                   wages
## [1,] "1"    "Sunday and Monday"        "$775"
## [2,] "2"    "Monday and Tuesday"       "$800"
## [3,] "3"    "Tuesday and Wednesday"    "$800"
## [4,] "4"    "Wednesday and Thursday"   "$800"
## [5,] "5"    "Thursday and Friday"      "$800"
## [6,] "6"    "Friday and Saturday"      "$775"
## [7,] "7"    "Saturday and Sunday"      "$750"
```

```r
solve(AP_HUB)
```

```
## Error in solve(AP_HUB): object 'AP_HUB' not found
```

```r
get.objective(AP_HUB)
```

```
## Error in get.objective(AP_HUB): could not find function "get.objective"
```

```r
get.variables(AP_HUB)
```

```
## Error in get.variables(AP_HUB): could not find function "get.variables"
```

from the variables we can evaluate that no. of workers assigned to particular day as:

$X1$= no. of workers assigned on shift 1=2 $X2$= no. of workers assigned on shift 2=4 $X3$= no. of workers assigned on shift 3=5 $X4$= no. of workers assigned on shift 4=0 $X5$= no. of workers assigned on shift 5=8 $X6$= no. of workers assigned on shift 6=1 $X7$= no. of workers assigned on shift 7=13

from the variables we can observe that how many vworkers are available to work each day with respect to the objective function as well as the constraints framed by the organization

Sunday = $x2 + x3 + x4 + x5 + x6$ = 18 Workers

Monday = $x3 + x4 + x5 + x6 + x7$ = 27 Workers

Tuesday = $x4 + x5 + x6 + x7 + x1$ = 24 Workers

Wednesday = $x5 + x6 + x7 + x1 + x2$ = 28 Workers

Thursday = $x6 + x7 + x1 + x2 + x3$ = 25 Workers

Friday = $x7 + x1 + x2 + x3 + x4$ = 24 Workers

Saturday = $x1 + x2 + x3 + x4 + x5$ = 19 Workers