CD2007 Semana 02 Solución Caso2 Parte 2

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Case 2

Part 2: Solution

In **extension** to the previous solution (`Part 1`), we need to introduce four additional binary variables,

$$b_1 = \begin{cases} 1, & \text{if there is production in month } i, \\ 0, & \text{otherwise.} \end{cases}$$

We define the `decision variables` (label and order) as follows:

$$(q_1, q_2, q_3, q_4, s_1, s_2, s_3, s_4, b_1, b_2, b_3, b_4).$$

Accordingly, the specification of the `lpSolve` inputs and solution of the `LP` problem are given by:

```
I.rule <- "min"
II.fobj <- c(12,12,12,12,2,2,2,2,1000,1000,1000,1000)
III.Acon <- matrix(c(1,0,0,0,-1,0,0,0,0,0,0,0,
                     0,1,0,0,1,-1,0,0,0,0,0,0,
                     0,0,1,0,0,1,-1,0,0,0,0,0,
                     0,0,0,1,0,0,1,-1,0,0,0,0,
                     -1,0,0,0,0,0,0,0,400,0,0,0,
                     0,-1,0,0,0,0,0,0,0,400,0,0,
                     0,0,-1,0,0,0,0,0,0,0,300,0,
                     0,0,0,-1,0,0,0,0,0,0,0,300),
                   nrow = 8,
                   byrow = TRUE)
IV.dir <- c("=","=","=","=",">=",">=",">=",">=")
V.bound <- c(100,200,150,400,0,0,0,0)

library("lpSolve")
case2p2.sol <- lp(I.rule,
                  II.fobj,
                  III.Acon,
                  IV.dir,
                  V.bound)

case2p2.sol$objval
```

```
## [1] 12783.33
```

```
case2p2.sol$solution
```

```
##  [1] 100.000000 200.000000 150.000000 400.000000   0.000000   0.000000
##  [7]   0.000000   0.000000   0.250000   0.500000   0.500000   1.333333
```