vkatta_4

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1. Heart Start AEDs

Reading LP file

```
library(lpSolve)
library(lpSolveAPI)

lprec <- read.lp("vkatta_4.lp")
```

Solving the LP problem using the Solve() function

```
solve(lprec)
```

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

```
get.objective(lprec)
```

```
## [1] 132790
```

```
get.variables(lprec)
```

```
## [1]  0 60 40 80  0 30
```

```
get.constraints(lprec)
```

```
## [1] 100 110  80  60  70
```

Arranging the solution of the LP problem with variables against values

```
ColNames <- c("AW1", "AW2", "AW3", "BW1", "BW2", "BW3")
solution <- data.frame(ColNames, get.variables(lprec)) # Solution of the problem
colnames(solution) <- c("variable", "value")
solution
```

```
##   variable value
## 1      AW1     0
## 2      AW2    60
## 3      AW3    40
## 4      BW1    80
## 5      BW2     0
## 6      BW3    30
```

Hence, Plant A is to produce 100 units and ship 60 units to Warehouse2 and 40 units to Warehouse3

Plant B is to produce 110 units and ship 80 units to Warehouse1 and 30 units to Warehouse3

2. Texxon Oil Distribution

1) Minimum Cost of providing oil to refineries

Given, Capacity of wells W1, W2 and W3 are 93, 88 and 95 respectively Requirements of refineries R1, R2, R3, R4, R5 are 30, 57, 48, 91 and 48 respectively

Let, Xji be the flow of oil from well i to Pump j where, i= W1,2,3 Charges levied on pipeline usage are as follows: AW1 - Well1 to PumpA = 1.52 AR1 - PumpA to Refinery1 = 5.15 AW2 - Well2 to PumpA = 1.70 BR1 - PumpB to Refinery1 = 5.12 AW3 - Well3 to PumpA = 1.45 CR1 - PumpB to Refinery1 = 5.32 BW1 - Well1 to PumpB = 1.60 AR2 - PumpA to Refinery2 = 5.69 BW2 - Well2 to PumpB = 1.63 BR2 - PumpB to Refinery2 = 5.47 BW3 - Well3 to PumpB = 1.57 CR2 - PumpC to Refinery2 = 6.16 CW1 - Well1 to PumpC = 1.40 AR3 - PumpA to Refinery3 = 6.13 CW2 - Well2 to PumpC = 1.55 BR3 - PumpB to Refinery3 = 6.05 CW3 - Well3 to PumpC = 1.30 CR3 - PumpC to Refinery3 = 6.25 AR4 - PumpA to Refinery4 = 5.63 BR4 - PumpB to Refinery4 = 6.12 CR4 - PumpC to Refinery4 = 6.17 AR5 - PumpA to Refinery5 = 5.80 BR5 - PumpB to Refinery5 = 5.71 CR5 - PumpC to Refinery5 = 5.87

Here, the minimum cost function is:

Where, AW1 + BW1 + CW1 <= 93 AW2 + BW2 + CW2 <= 88 AW3 + BW3 + CW3 <= 95