Linear Programming II

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```r
library(lpSolve)

# Define the target function and constraints for Question 1
obj <- c(50, 58, 46, 62)
const <- matrix(c(4, 3.5, 4.6, 3.9,
  2.1, 2.6, 3.5, 1.9,
  15, 23, 18, 25,
  8, 12.6, 9.7, 10.5,
  -0.4, -0.4, 0.6, 0.6), nrow = 5, byrow = TRUE)
rhs <- c(600, 500, 3600, 1700, 0)
const_sign <- rep("<=", 5)

# Solve the linear programming problem for Question 1
lp <- lp(direction = "max",
         objective.in = obj,
         const.mat = const,
         const.dir = const_sign,
         const.rhs = rhs)

sol <- lp["solution"]
optimal_solution <- sol[1:4]
optimal_objective <- lp$objval

cat("Optimal solution:")
```

```
## Optimal solution:
```

```r
print(optimal_solution)
```

```
## $solution
## [1] 36.71421 58.63708  0.00000 63.56753
##
## $<NA>
## NULL
##
## $<NA>
## NULL
##
## $<NA>
## NULL
```

```r
cat("Optimal objective value:")
```

```
## Optimal objective value:
```

```r
print(optimal_objective)
```

```
## [1] 9177.848
```

```r
library(lpSolve)

obj <- c(50, 58, 46, 62)
const <- matrix(c(4, 3.5, 4.6, 3.9,
2.1, 2.6, 3.5, 1.9,
15, 23, 18, 25,
8, 12.6, 9.7, 10.5,
-0.4,-0.4,+0.6,+0.6), nrow = 5, byrow = TRUE)

rhs <- c(600, 500, 3600, 1700,0)
const_sign <- rep("<=", 5)

lp <- lp(direction = "max",
objective.in = obj,
const.mat = const,
const.dir = const_sign,
const.rhs = rhs,
int.vec = 1:4)

sol <- lp["solution"]
optimal_solution <- sol[1:5]
optimal_objective <- lp$objval

cat("Optimal solution:")
```

```
## Optimal solution:
```

```r
print(optimal_solution)
```

```
## $solution
## [1] 39 60  0 60
##
## $<NA>
## NULL
##
## $<NA>
## NULL
##
## $<NA>
## NULL
##
## $<NA>
## NULL
```

```r
cat("Optimal objective value:")
```

```
## Optimal objective value:
```

```r
print(optimal_objective)
```

```
## [1] 9150
```