EX\_6

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#1st Problem   
  
library(linprog)

## Loading required package: lpSolve

# coefficients  
ld\_cvec <- c(4, 2, 9)  
# matrix A  
ld\_Amat <- matrix(c(2, 1, 1, -1, 1, -3), nrow = 2, byrow = TRUE)  
# vector b  
ld\_bvec <- c(2, -3)  
  
ld\_result <- solveLP(ld\_cvec, ld\_bvec, ld\_Amat, maximum = TRUE)  
# optimal values  
ld\_optimal\_values <- ld\_result$solution  
print(ld\_result)

##   
##   
## Results of Linear Programming / Linear Optimization  
##   
## Objective function (Maximum): 18   
##   
## Iterations in phase 1: 1  
## Iterations in phase 2: 1  
## Solution  
## opt  
## 1 0  
## 2 0  
## 3 2  
##   
## Basic Variables  
## opt  
## 3 2  
## S 2 3  
##   
## Constraints  
## actual dir bvec free dual dual.reg  
## 1 2 <= 2 0 9 1  
## 2 -6 <= -3 3 0 3  
##   
## All Variables (including slack variables)  
## opt cvec min.c max.c marg marg.reg  
## 1 0 4 -Inf 18 -14 0.60  
## 2 0 2 -Inf 9 -7 0.75  
## 3 2 9 2.00 Inf NA NA  
## S 1 0 0 -Inf 9 -9 1.00  
## S 2 3 0 -1.75 Inf 0 NA

#2nd Problem  
library(quadprog)  
# Quadratic term matrix  
ld\_Dmat <- matrix(c(2, 0, 0, 2), nrow = 2, byrow = TRUE)  
# Linear term vector  
ld\_dvec <- c(-5, -7)  
ld\_Amat <- matrix(c(4, 1, 1, 4), nrow = 2, byrow = TRUE)  
ld\_bvec <- c(20, 20)  
ld\_result <- solve.QP(ld\_Dmat, ld\_dvec, ld\_Amat, ld\_bvec)  
print("Optimal Solution:")

## [1] "Optimal Solution:"

print(ld\_result$solution)

## [1] 4 4

print("Optimal Objective Value:")

## [1] "Optimal Objective Value:"

print(ld\_result$value)

## [1] 80