QMM\_Project

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options(repos = c(CRAN = "https://cran.rstudio.com"))

#installing packages  
install.packages("lpSolve")

## Installing package into 'C:/Users/Atshaya Suresh/AppData/Local/R/win-library/4.3'  
## (as 'lib' is unspecified)

## package 'lpSolve' successfully unpacked and MD5 sums checked

## Warning: cannot remove prior installation of package 'lpSolve'

## Warning in file.copy(savedcopy, lib, recursive = TRUE): problem copying  
## C:\Users\Atshaya  
## Suresh\AppData\Local\R\win-library\4.3\00LOCK\lpSolve\libs\x64\lpSolve.dll to  
## C:\Users\Atshaya  
## Suresh\AppData\Local\R\win-library\4.3\lpSolve\libs\x64\lpSolve.dll: Permission  
## denied

## Warning: restored 'lpSolve'

##   
## The downloaded binary packages are in  
## C:\Users\Atshaya Suresh\AppData\Local\Temp\Rtmp0gWX5y\downloaded\_packages

library(lpSolve)

## Warning: package 'lpSolve' was built under R version 4.3.2

set.seed(123) # Set seed for reproducibility  
  
# Generate random data  
students <- data.frame(  
 GPA = sample(0:4, 15, replace = TRUE),  
 Attendance = sample(0:10, 15, replace = TRUE),  
 programming\_skills = sample(1:10, 15, replace = TRUE)  
)  
  
students

## GPA Attendance programming\_skills  
## 1 2 8 7  
## 2 2 8 9  
## 3 1 2 9  
## 4 1 7 10  
## 5 2 9 7  
## 6 4 6 5  
## 7 3 9 7  
## 8 0 8 5  
## 9 1 2 6  
## 10 2 3 9  
## 11 4 0 2  
## 12 2 10 5  
## 13 2 6 8  
## 14 0 4 2  
## 15 3 9 1

# Assuming your data frame is named 'df'  
df <- data.frame(  
 GPA = c(2,2,1,1,2,4,3,0,1,2,4,2,2,0,3),  
 Attendance = c(10, 4, 2, 10, 8, 8, 8, 2, 7, 9, 6, 9, 8, 2, 3),  
 programming\_skills = c(1, 7, 5, 10, 7, 9, 9, 10, 7, 5, 7, 5, 6, 9, 2)  
)  
  
# Define weights  
weights <- c(0.3333, 0.3333, 0.3333)  
  
# Calculate the weighted average for each column  
weighted\_avg <- colMeans(df) %\*% weights  
  
# Add the weighted average as a new column  
df$weighted\_output <- rowSums(df \* weights)  
  
# Add a new column C1, C2, ..., C15  
df$C <- paste0("C", seq\_len(nrow(df)))  
  
# Print the updated dataframe  
print(df)

## GPA Attendance programming\_skills weighted\_output C  
## 1 2 10 1 4.3329 C1  
## 2 2 4 7 4.3329 C2  
## 3 1 2 5 2.6664 C3  
## 4 1 10 10 6.9993 C4  
## 5 2 8 7 5.6661 C5  
## 6 4 8 9 6.9993 C6  
## 7 3 8 9 6.6660 C7  
## 8 0 2 10 3.9996 C8  
## 9 1 7 7 4.9995 C9  
## 10 2 9 5 5.3328 C10  
## 11 4 6 7 5.6661 C11  
## 12 2 9 5 5.3328 C12  
## 13 2 8 6 5.3328 C13  
## 14 0 2 9 3.6663 C14  
## 15 3 3 2 2.6664 C15

c1 <- 4.332  
c2 <- 4.332  
c3 <- 2.666  
c4 <- 6.999  
c5 <- 5.666  
c6 <- 6.999  
c7 <- 6.666  
c8 <- 3.999  
c9 <- 4.999  
c10 <- 5.332  
c11 <- 5.666  
c12 <- 5.332  
c13 <- 5.332  
c14 <- 3.666  
c15 <- 2.666

f.obj <- c(c1,c1,c1,c1,c1,  
 c2,c2,c2,c2,c2,  
 c3,c3,c3,c3,c3,  
 c4,c4,c4,c4,c4,  
 c5,c5,c5,c5,c5,  
 c6,c6,c6,c6,c6,  
 c7,c7,c7,c7,c7,  
 c8,c8,c8,c8,c8,  
 c9,c9,c9,c9,c9,  
 c10,c10,c10,c10,c10,  
 c11,c11,c11,c11,c11,  
 c12,c12,c12,c12,c12,  
 c13,c13,c13,c13,c13,  
 c14,c14,c14,c14,c14,c15,  
 c15,c15,c15,c15)  
f.obj

## [1] 4.332 4.332 4.332 4.332 4.332 4.332 4.332 4.332 4.332 4.332 2.666 2.666  
## [13] 2.666 2.666 2.666 6.999 6.999 6.999 6.999 6.999 5.666 5.666 5.666 5.666  
## [25] 5.666 6.999 6.999 6.999 6.999 6.999 6.666 6.666 6.666 6.666 6.666 3.999  
## [37] 3.999 3.999 3.999 3.999 4.999 4.999 4.999 4.999 4.999 5.332 5.332 5.332  
## [49] 5.332 5.332 5.666 5.666 5.666 5.666 5.666 5.332 5.332 5.332 5.332 5.332  
## [61] 5.332 5.332 5.332 5.332 5.332 3.666 3.666 3.666 3.666 3.666 2.666 2.666  
## [73] 2.666 2.666 2.666

f.con <-matrix(c(1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,  
0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,  
0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,  
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,  
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,  
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,  
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,  
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,  
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,  
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,  
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,  
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,  
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,0,0,0,0,0,  
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,0,0,0,0,0,  
0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,1,1,1,1,  
1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,  
0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,  
0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,  
0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,  
0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,0,0,0,0,1,  
  
2,0,0,0,0,2,0,0,0,0,1,0,0,0,0,1,0,0,0,0,2,0,0,0,0,4,0,0,0,0,3,0,0,0,0,0,0,0,0,0,1,0,0,0,0,2,0,0,0,0,4,0,0,0,0,2,0,0,0,0,2,0,0,0,0,0,0,0,0,0,3,0,0,0,0,  
0,2,0,0,0,0,2,0,0,0,0,1,0,0,0,0,1,0,0,0,0,2,0,0,0,0,4,0,0,0,0,3,0,0,0,0,0,0,0,0,0,1,0,0,0,0,2,0,0,0,0,4,0,0,0,0,2,0,0,0,0,2,0,0,0,0,0,0,0,0,0,3,0,0,  
0,0,2,0,0,0,0,2,0,0,0,0,1,0,0,0,0,1,0,0,0,0,2,0,0,0,0,4,0,0,0,0,3,0,0,0,0,0,0,0,0,0,1,0,0,0,0,2,0,0,0,0,4,0,0,0,0,2,0,0,0,0,2,0,0,0,0,0,0,0,0,0,3,0,0,  
0,0,0,2,0,0,0,0,2,0,0,0,0,1,0,0,0,0,1,0,0,0,0,2,0,0,0,0,4,0,0,0,0,3,0,0,0,0,0,0,0,0,0,1,0,0,0,0,2,0,0,0,0,4,0,0,0,0,2,0,0,0,0,2,0,0,0,0,0,0,0,0,0,3,0,  
0,0,0,0,2,0,0,0,0,2,0,0,0,0,1,0,0,0,0,1,0,0,0,0,2,0,0,0,0,4,0,0,0,0,3,0,0,0,0,0,0,0,0,0,1,0,0,0,0,2,0,0,0,0,4,0,0,0,0,2,0,0,0,0,2,0,0,0,0,0,0,0,0,0,3,  
  
10,0,0,0,0,4,0,0,0,0,2,0,0,0,0,10,0,0,0,0,8,0,0,0,0,8,0,0,0,0,8,0,0,0,0,2,0,0,0,0,7,0,0,0,0,9,0,0,0,0,6,0,0,0,0,9,0,0,0,0,8,0,0,0,0,2,0,0,0,0,3,0,0,0,0,  
0,10,0,0,0,0,4,0,0,0,0,2,0,0,0,0,10,0,0,0,0,8,0,0,0,0,8,0,0,0,0,8,0,0,0,0,2,0,0,0,0,7,0,0,0,0,9,0,0,0,0,6,0,0,0,0,9,0,0,0,0,8,0,0,0,0,2,0,0,0,0,3,0,0,  
0,0,10,0,0,0,0,4,0,0,0,0,2,0,0,0,0,10,0,0,0,0,8,0,0,0,0,8,0,0,0,0,8,0,0,0,0,2,0,0,0,0,7,0,0,0,0,9,0,0,0,0,6,0,0,0,0,9,0,0,0,0,8,0,0,0,0,2,0,0,0,0,3,0,0,  
0,0,0,10,0,0,0,0,4,0,0,0,0,2,0,0,0,0,10,0,0,0,0,8,0,0,0,0,8,0,0,0,0,8,0,0,0,0,2,0,0,0,0,7,0,0,0,0,9,0,0,0,0,6,0,0,0,0,9,0,0,0,0,8,0,0,0,0,2,0,0,0,0,3,0,  
0,0,0,0,10,0,0,0,0,4,0,0,0,0,2,0,0,0,0,10,0,0,0,0,8,0,0,0,0,8,0,0,0,0,8,0,0,0,0,2,0,0,0,0,7,0,0,0,0,9,0,0,0,0,6,0,0,0,0,9,0,0,0,0,8,0,0,0,0,2,0,0,0,0,3,  
  
1,0,0,0,0,7,0,0,0,0,5,0,0,0,0,10,0,0,0,0,7,0,0,0,0,9,0,0,0,0,9,0,0,0,0,10,0,0,0,0,7,0,0,0,0,5,0,0,0,0,7,0,0,0,0,5,0,0,0,0,6,0,0,0,0,9,0,0,0,0,2,0,0,0,0,  
0,1,0,0,0,0,7,0,0,0,0,5,0,0,0,0,10,0,0,0,0,7,0,0,0,0,9,0,0,0,0,9,0,0,0,0,10,0,0,0,0,7,0,0,0,0,5,0,0,0,0,7,0,0,0,0,5,0,0,0,0,6,0,0,0,0,9,0,0,0,0,2,0,0,  
0,0,1,0,0,0,0,7,0,0,0,0,5,0,0,0,0,10,0,0,0,0,7,0,0,0,0,9,0,0,0,0,9,0,0,0,0,10,0,0,0,0,7,0,0,0,0,5,0,0,0,0,7,0,0,0,0,5,0,0,0,0,6,0,0,0,0,9,0,0,0,0,2,0,0,  
0,0,0,1,0,0,0,0,7,0,0,0,0,5,0,0,0,0,10,0,0,0,0,7,0,0,0,0,9,0,0,0,0,9,0,0,0,0,10,0,0,0,0,7,0,0,0,0,5,0,0,0,0,7,0,0,0,0,5,0,0,0,0,6,0,0,0,0,9,0,0,0,0,2,0,  
0,0,0,0,1,0,0,0,0,7,0,0,0,0,5,0,0,0,0,10,0,0,0,0,7,0,0,0,0,9,0,0,0,0,9,0,0,0,0,10,0,0,0,0,7,0,0,0,0,5,0,0,0,0,7,0,0,0,0,5,0,0,0,0,6,0,0,0,0,9,0,0,0,0,2  
), nrow = 35, byrow = TRUE)

## Warning in matrix(c(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, :  
## data length [2621] is not a sub-multiple or multiple of the number of rows [35]

f.con

## [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10] [,11] [,12] [,13]  
## [1,] 1 1 1 1 1 0 0 0 0 0 0 0 0  
## [2,] 0 0 0 0 0 1 1 1 1 1 0 0 0  
## [3,] 0 0 0 0 0 0 0 0 0 0 1 1 1  
## [4,] 0 0 0 0 0 0 0 0 0 0 0 0 0  
## [5,] 0 0 0 0 0 0 0 0 0 0 0 0 0  
## [6,] 0 0 0 0 0 0 0 0 0 0 0 0 0  
## [7,] 0 0 0 0 0 0 0 0 0 0 0 0 0  
## [8,] 0 0 0 0 0 0 0 0 0 0 0 0 0  
## [9,] 0 0 0 0 0 0 0 0 0 0 0 0 0  
## [10,] 0 0 0 0 0 0 0 0 0 0 0 0 0  
## [11,] 0 0 0 0 0 0 0 0 0 0 0 0 0  
## [12,] 0 0 0 0 0 0 0 0 0 0 0 0 0  
## [13,] 0 0 0 0 0 0 0 0 0 0 0 0 0  
## [14,] 0 0 0 0 0 0 0 0 0 0 0 0 0  
## [15,] 0 0 0 0 0 0 0 0 0 0 0 0 0  
## [16,] 1 0 0 0 0 1 0 0 0 0 1 0 0  
## [17,] 0 1 0 0 0 0 1 0 0 0 0 1 0  
## [18,] 0 1 0 0 0 0 1 0 0 0 0 1 0  
## [19,] 0 0 1 0 0 0 0 1 0 0 0 0 1  
## [20,] 0 0 0 1 0 0 0 0 1 0 0 0 0  
## [21,] 0 0 0 0 2 0 0 0 0 1 0 0 0  
## [22,] 2 0 0 0 0 2 0 0 0 0 1 0 0  
## [23,] 2 0 0 0 0 2 0 0 0 0 1 0 0  
## [24,] 0 2 0 0 0 0 2 0 0 0 0 1 0  
## [25,] 0 0 2 0 0 0 0 2 0 0 0 0 1  
## [26,] 0 0 0 4 0 0 0 0 2 0 0 0 0  
## [27,] 0 0 0 0 4 0 0 0 0 2 0 0 0  
## [28,] 0 0 0 0 4 0 0 0 0 2 0 0 0  
## [29,] 10 0 0 0 0 4 0 0 0 0 2 0 0  
## [30,] 0 10 0 0 0 0 4 0 0 0 0 2 0  
## [31,] 0 0 7 0 0 0 0 5 0 0 0 0 10  
## [32,] 0 0 0 7 0 0 0 0 5 0 0 0 0  
## [33,] 0 0 0 7 0 0 0 0 5 0 0 0 0  
## [34,] 0 0 0 0 7 0 0 0 0 5 0 0 0  
## [35,] 1 0 0 0 0 7 0 0 0 0 5 0 0  
## [,14] [,15] [,16] [,17] [,18] [,19] [,20] [,21] [,22] [,23] [,24] [,25]  
## [1,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [2,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [3,] 1 1 0 0 0 0 0 0 0 0 0 0  
## [4,] 0 0 1 1 1 1 1 0 0 0 0 0  
## [5,] 0 0 0 0 0 0 0 1 1 1 1 1  
## [6,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [7,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [8,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [9,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [10,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [11,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [12,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [13,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [14,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [15,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [16,] 0 0 1 0 0 0 0 1 0 0 0 0  
## [17,] 0 0 0 1 0 0 0 0 1 0 0 0  
## [18,] 0 0 0 1 0 0 0 0 1 0 0 0  
## [19,] 0 0 0 0 1 0 0 0 0 1 0 0  
## [20,] 1 0 0 0 0 1 0 0 0 0 1 0  
## [21,] 0 1 0 0 0 0 2 0 0 0 0 4  
## [22,] 0 0 1 0 0 0 0 2 0 0 0 0  
## [23,] 0 0 1 0 0 0 0 2 0 0 0 0  
## [24,] 0 0 0 1 0 0 0 0 2 0 0 0  
## [25,] 0 0 0 0 1 0 0 0 0 2 0 0  
## [26,] 10 0 0 0 0 8 0 0 0 0 8 0  
## [27,] 0 10 0 0 0 0 8 0 0 0 0 8  
## [28,] 0 10 0 0 0 0 8 0 0 0 0 8  
## [29,] 0 0 10 0 0 0 0 8 0 0 0 0  
## [30,] 0 0 0 10 0 0 0 0 8 0 0 0  
## [31,] 0 0 0 0 7 0 0 0 0 9 0 0  
## [32,] 10 0 0 0 0 7 0 0 0 0 9 0  
## [33,] 10 0 0 0 0 7 0 0 0 0 9 0  
## [34,] 0 10 0 0 0 0 7 0 0 0 0 9  
## [35,] 0 0 10 0 0 0 0 7 0 0 0 0  
## [,26] [,27] [,28] [,29] [,30] [,31] [,32] [,33] [,34] [,35] [,36] [,37]  
## [1,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [2,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [3,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [4,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [5,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [6,] 1 1 1 1 1 0 0 0 0 0 0 0  
## [7,] 0 0 0 0 0 1 1 1 1 1 0 0  
## [8,] 0 0 0 0 0 0 0 0 0 0 1 1  
## [9,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [10,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [11,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [12,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [13,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [14,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [15,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [16,] 1 0 0 0 0 1 0 0 0 0 1 0  
## [17,] 0 1 0 0 0 0 1 0 0 0 0 1  
## [18,] 0 1 0 0 0 0 1 0 0 0 0 1  
## [19,] 0 0 1 0 0 0 0 1 0 0 0 0  
## [20,] 0 0 0 1 0 0 0 0 1 0 0 0  
## [21,] 0 0 0 0 3 0 0 0 0 0 0 0  
## [22,] 4 0 0 0 0 3 0 0 0 0 0 0  
## [23,] 4 0 0 0 0 3 0 0 0 0 0 0  
## [24,] 0 4 0 0 0 0 3 0 0 0 0 0  
## [25,] 0 0 4 0 0 0 0 3 0 0 0 0  
## [26,] 0 0 0 8 0 0 0 0 2 0 0 0  
## [27,] 0 0 0 0 8 0 0 0 0 2 0 0  
## [28,] 0 0 0 0 8 0 0 0 0 2 0 0  
## [29,] 8 0 0 0 0 8 0 0 0 0 2 0  
## [30,] 0 8 0 0 0 0 8 0 0 0 0 2  
## [31,] 0 0 9 0 0 0 0 10 0 0 0 0  
## [32,] 0 0 0 9 0 0 0 0 10 0 0 0  
## [33,] 0 0 0 9 0 0 0 0 10 0 0 0  
## [34,] 0 0 0 0 9 0 0 0 0 10 0 0  
## [35,] 9 0 0 0 0 9 0 0 0 0 10 0  
## [,38] [,39] [,40] [,41] [,42] [,43] [,44] [,45] [,46] [,47] [,48] [,49]  
## [1,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [2,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [3,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [4,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [5,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [6,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [7,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [8,] 1 1 1 0 0 0 0 0 0 0 0 0  
## [9,] 0 0 0 1 1 1 1 1 0 0 0 0  
## [10,] 0 0 0 0 0 0 0 0 1 1 1 1  
## [11,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [12,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [13,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [14,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [15,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [16,] 0 0 0 1 0 0 0 0 1 0 0 0  
## [17,] 0 0 0 0 1 0 0 0 0 1 0 0  
## [18,] 0 0 0 0 1 0 0 0 0 1 0 0  
## [19,] 1 0 0 0 0 1 0 0 0 0 1 0  
## [20,] 0 1 0 0 0 0 1 0 0 0 0 1  
## [21,] 0 0 1 0 0 0 0 2 0 0 0 0  
## [22,] 0 0 0 1 0 0 0 0 2 0 0 0  
## [23,] 0 0 0 1 0 0 0 0 2 0 0 0  
## [24,] 0 0 0 0 1 0 0 0 0 2 0 0  
## [25,] 0 0 0 0 0 1 0 0 0 0 2 0  
## [26,] 0 7 0 0 0 0 9 0 0 0 0 6  
## [27,] 0 0 7 0 0 0 0 9 0 0 0 0  
## [28,] 0 0 7 0 0 0 0 9 0 0 0 0  
## [29,] 0 0 0 7 0 0 0 0 9 0 0 0  
## [30,] 0 0 0 0 7 0 0 0 0 9 0 0  
## [31,] 7 0 0 0 0 5 0 0 0 0 7 0  
## [32,] 0 7 0 0 0 0 5 0 0 0 0 7  
## [33,] 0 7 0 0 0 0 5 0 0 0 0 7  
## [34,] 0 0 7 0 0 0 0 5 0 0 0 0  
## [35,] 0 0 0 7 0 0 0 0 5 0 0 0  
## [,50] [,51] [,52] [,53] [,54] [,55] [,56] [,57] [,58] [,59] [,60] [,61]  
## [1,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [2,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [3,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [4,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [5,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [6,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [7,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [8,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [9,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [10,] 1 0 0 0 0 0 0 0 0 0 0 0  
## [11,] 0 1 1 1 1 1 0 0 0 0 0 0  
## [12,] 0 0 0 0 0 0 1 1 1 1 1 0  
## [13,] 0 0 0 0 0 0 0 0 0 0 0 1  
## [14,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [15,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [16,] 0 1 0 0 0 0 1 0 0 0 0 1  
## [17,] 0 0 1 0 0 0 0 1 0 0 0 0  
## [18,] 0 0 1 0 0 0 0 1 0 0 0 0  
## [19,] 0 0 0 1 0 0 0 0 1 0 0 0  
## [20,] 0 0 0 0 1 0 0 0 0 1 0 0  
## [21,] 4 0 0 0 0 2 0 0 0 0 2 0  
## [22,] 0 4 0 0 0 0 2 0 0 0 0 2  
## [23,] 0 4 0 0 0 0 2 0 0 0 0 2  
## [24,] 0 0 4 0 0 0 0 2 0 0 0 0  
## [25,] 0 0 0 4 0 0 0 0 2 0 0 0  
## [26,] 0 0 0 0 9 0 0 0 0 8 0 0  
## [27,] 6 0 0 0 0 9 0 0 0 0 8 0  
## [28,] 6 0 0 0 0 9 0 0 0 0 8 0  
## [29,] 0 6 0 0 0 0 9 0 0 0 0 8  
## [30,] 0 0 6 0 0 0 0 9 0 0 0 0  
## [31,] 0 0 0 5 0 0 0 0 6 0 0 0  
## [32,] 0 0 0 0 5 0 0 0 0 6 0 0  
## [33,] 0 0 0 0 5 0 0 0 0 6 0 0  
## [34,] 7 0 0 0 0 5 0 0 0 0 6 0  
## [35,] 0 7 0 0 0 0 5 0 0 0 0 6  
## [,62] [,63] [,64] [,65] [,66] [,67] [,68] [,69] [,70] [,71] [,72] [,73]  
## [1,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [2,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [3,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [4,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [5,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [6,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [7,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [8,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [9,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [10,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [11,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [12,] 0 0 0 0 0 0 0 0 0 0 0 0  
## [13,] 1 1 1 1 0 0 0 0 0 0 0 0  
## [14,] 0 0 0 0 1 1 1 1 1 0 0 0  
## [15,] 0 0 0 0 0 0 0 0 0 1 1 1  
## [16,] 0 0 0 0 1 0 0 0 0 1 0 0  
## [17,] 1 0 0 0 0 1 0 0 0 0 1 0  
## [18,] 1 0 0 0 0 1 0 0 0 0 1 0  
## [19,] 0 1 0 0 0 0 1 0 0 0 0 1  
## [20,] 0 0 1 0 0 0 0 1 0 0 0 0  
## [21,] 0 0 0 0 0 0 0 0 3 0 0 0  
## [22,] 0 0 0 0 0 0 0 0 0 3 0 0  
## [23,] 0 0 0 0 0 0 0 0 0 3 0 0  
## [24,] 2 0 0 0 0 0 0 0 0 0 3 0  
## [25,] 0 2 0 0 0 0 0 0 0 0 0 3  
## [26,] 0 0 2 0 0 0 0 3 0 0 0 0  
## [27,] 0 0 0 2 0 0 0 0 3 0 0 0  
## [28,] 0 0 0 2 0 0 0 0 3 0 0 0  
## [29,] 0 0 0 0 2 0 0 0 0 3 0 0  
## [30,] 8 0 0 0 0 2 0 0 0 0 3 1  
## [31,] 0 9 0 0 0 0 2 0 0 0 0 0  
## [32,] 0 0 9 0 0 0 0 2 0 0 0 0  
## [33,] 0 0 9 0 0 0 0 2 0 0 0 0  
## [34,] 0 0 0 9 0 0 0 0 2 0 0 0  
## [35,] 0 0 0 0 9 0 0 0 0 2 1 1  
## [,74] [,75]  
## [1,] 0 0  
## [2,] 0 0  
## [3,] 0 0  
## [4,] 0 0  
## [5,] 0 0  
## [6,] 0 0  
## [7,] 0 0  
## [8,] 0 0  
## [9,] 0 0  
## [10,] 0 0  
## [11,] 0 0  
## [12,] 0 0  
## [13,] 0 0  
## [14,] 0 0  
## [15,] 1 1  
## [16,] 0 0  
## [17,] 0 0  
## [18,] 0 0  
## [19,] 0 0  
## [20,] 1 2  
## [21,] 0 0  
## [22,] 0 0  
## [23,] 0 0  
## [24,] 0 0  
## [25,] 10 0  
## [26,] 0 10  
## [27,] 0 10  
## [28,] 0 0  
## [29,] 0 0  
## [30,] 0 0  
## [31,] 1 0  
## [32,] 1 0  
## [33,] 0 1  
## [34,] 0 0  
## [35,] 1 1

Set equality signs

f.dir <- c( "=", "=", "=", "=","=","=", "=", "=", "=","=",  
 "=", "=", "=", "=","=","=", "=", "=", "=","=",  
 ">=", ">=", ">=", ">=",">=",">=", ">=", ">=", ">=",">=",  
 ">=", ">=", ">=", ">=",">=")

Set RHS coefficients

f.rhs <-c(1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,3,3,3,3,3,1.9333,1.9333,1.9333,1.9333,1.9333,6.4,6.4,6.4,6.4,6.4,6.6,6.6,6.6,6.6,6.6)

types <- c("I","I","I","I","I",  
 "I","I","I","I","I",  
 "I","I","I","I","I",  
 "I","I","I","I","I",  
 "I","I","I","I","I",  
 "I","I","I","I","I",  
 "I","I","I","I","I",  
 "I","I","I","I","I",  
 "I","I","I","I","I",  
 "I","I","I","I","I",  
 "I","I","I","I","I",  
 "I","I","I","I","I",  
 "I","I","I","I","I",  
 "I","I","I","I","I",  
 "I","I","I","I","I")

# Solve the linear programming problem  
lp\_solution <- lp("max", f.obj, f.con, f.dir, f.rhs, all.bin = TRUE)  
  
# Print the solution  
print(lp\_solution)

## Success: the objective function is 74.652

lp\_solution$solution

## [1] 1 0 0 0 0 1 0 0 0 0 0 1 0 0 0 0 1 0 0 0 0 0 0 0 1 0 0 0 0 1 0 0 0 1 0 0 0 1  
## [39] 0 0 0 1 0 0 0 0 0 0 0 1 0 0 1 0 0 0 0 0 0 1 0 0 1 0 0 1 0 0 0 0 0 0 0 0 1