Markdown1

## R Markdown

# Installing the required packages in R for this project  
library(recommenderlab)

## Loading required package: Matrix

## Loading required package: arules

##   
## Attaching package: 'arules'

## The following objects are masked from 'package:base':  
##   
## abbreviate, write

## Loading required package: proxy

##   
## Attaching package: 'proxy'

## The following object is masked from 'package:Matrix':  
##   
## as.matrix

## The following objects are masked from 'package:stats':  
##   
## as.dist, dist

## The following object is masked from 'package:base':  
##   
## as.matrix

## Loading required package: registry

library(reshape2)  
library(ggplot2)  
# Read training file along with header  
tr <- read.csv("C:/Users/Anamikja/Desktop/Anamika/Springboard/train\_v2.csv", header = TRUE)  
  
head(tr)

## ID user movie rating  
## 1 610739 3704 3784 3  
## 2 324753 1924 802 3  
## 3 808218 4837 1387 4  
## 4 133808 867 1196 4  
## 5 431858 2631 3072 5  
## 6 895320 5410 2049 4

# Removing 'id' column since it is not needed  
tr<-tr[,-c(1)]  
  
tr[tr$user==1,]

## user movie rating  
## 34179 1 1907 4  
## 64257 1 1287 5  
## 68565 1 1566 4  
## 71239 1 260 4  
## 125237 1 919 4  
## 129691 1 3114 4  
## 148250 1 150 5  
## 152316 1 914 3  
## 162689 1 938 4  
## 169527 1 745 3  
## 212228 1 531 4  
## 231496 1 1207 4  
## 243319 1 1 5  
## 253470 1 1097 4  
## 255332 1 2294 4  
## 280862 1 2028 5  
## 282095 1 1028 5  
## 351922 1 1545 4  
## 352930 1 783 4  
## 379091 1 2355 5  
## 385526 1 1961 5  
## 399402 1 2762 4  
## 399943 1 2687 3  
## 415357 1 2797 4  
## 428508 1 1270 5  
## 447122 1 527 5  
## 515104 1 1029 5  
## 540605 1 661 3  
## 551363 1 720 3  
## 558155 1 594 4  
## 567976 1 1962 4  
## 608494 1 3408 4  
## 644625 1 48 5  
## 660236 1 1721 4  
## 684218 1 2918 4  
## 730534 1 1197 3  
## 732333 1 2791 4  
## 736360 1 1022 5

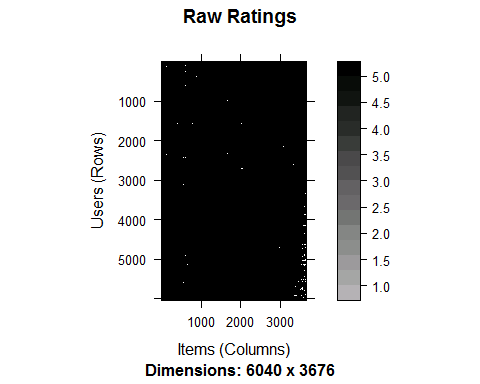
# re working the data to resemble a matrix like structure  
g<-acast(tr, user ~ movie)

## Using rating as value column: use value.var to override.

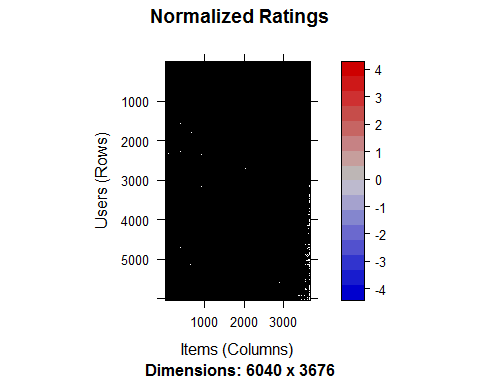
class(g)

## [1] "matrix"

# Converting g into an actual matrix  
R<-as.matrix(g)  
  
# Converting R into realRatingMatrix data structure  
# realRatingMatrix is a recommenderlab sparse-matrix like data-structure  
r <- as(R, "realRatingMatrix")  
  
  
# normalizing the rating matrix  
r\_m <- normalize(r)  
  
  
# plotting an image plot of raw-ratings & normalized ratings  
# A column represents one specific movie and ratings by users  
# are shaded.  
# Note that some items are always rated 'black' by most users  
# while some items are not rated by many users  
# On the other hand a few users always give high ratings  
# as in some cases a series of black dots cut across items  
image(r, main = "Raw Ratings")



image(r\_m, main = "Normalized Ratings")



# Creating a recommender object (model)  
# UBCF: User-based collaborative filtering  
# Parameter 'method' decides similarity measure  
# Jaccard method of distance measuring is implemented  
rec=Recommender(r[1:nrow(r)],method="UBCF", param=list(normalize = "Z-score",method="Jaccard",nn=5, minRating=1))

## Warning: Unknown parameters: minRating

## Available parameter (with default values):  
## method = cosine  
## nn = 25  
## sample = FALSE  
## normalize = center  
## verbose = FALSE

# Depending upon your selection, examine what you got  
names(getModel(rec))

## [1] "description" "data" "method" "nn" "sample"   
## [6] "normalize" "verbose"

getModel(rec)$nn

## [1] 5

############Create predictions#############################  
# This prediction does not predict movie ratings for test.  
# But it fills up the user 'X' item matrix so that  
# for any userid and movieid, I can find predicted rating  
  
# 'type' parameter decides whether you want ratings or top-n items  
# To get top-10 recommendations for a user :  
# predict(rec, r[1:nrow(r)], type="topNList", n=10)  
recom <- predict(rec, r[1:nrow(r)], type="ratings")  
  
  
########## Examination of model & experimentation #############  
  
  
# Convert all your recommendations to list structure  
rec\_list<-as(recom,"list")  
head(summary(rec\_list))

## Length Class Mode   
## 1 3638 -none- numeric  
## 2 3576 -none- numeric  
## 3 3637 -none- numeric  
## 4 3658 -none- numeric  
## 5 3536 -none- numeric  
## 6 3623 -none- numeric

# Access this list. User 1, item at index 1  
rec\_list[[1]][1]

## 2   
## 4.157895

# Convert to data frame all recommendations for user 1  
u1<-as.data.frame(rec\_list[[1]])  
attributes(u1)

## $names  
## [1] "rec\_list[[1]]"  
##   
## $row.names  
## [1] "2" "3" "4" "5" "6" "7" "8" "9" "10"   
## [10] "11" "12" "13" "14" "15" "16" "17" "18" "19"   
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## [3160] "3460" "3461" "3462" "3463" "3464" "3465" "3466" "3467" "3468"  
## [3169] "3469" "3470" "3471" "3472" "3473" "3474" "3475" "3476" "3477"  
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## [3205] "3505" "3506" "3507" "3508" "3509" "3510" "3511" "3512" "3513"  
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## [3610] "3924" "3925" "3926" "3927" "3928" "3929" "3930" "3931" "3932"  
## [3619] "3933" "3934" "3935" "3936" "3937" "3938" "3939" "3940" "3941"  
## [3628] "3942" "3943" "3944" "3945" "3946" "3947" "3948" "3949" "3950"  
## [3637] "3951" "3952"  
##   
## $class  
## [1] "data.frame"

class(u1)

## [1] "data.frame"

# Create a column by name of id in data frame u1 and populate it with row names  
u1$id<-row.names(u1)  
  
# Access movie ratings in column 1 for u1  
u1[u1$id==3952,1]

## [1] 4.157895

########## Create final File from model #######################  
# Read test file  
test<-read.csv("C:/Users/Anamikja/Desktop/Anamika/Springboard/test\_v2.csv",header=TRUE)  
head(test)

## ID user movie  
## 1 895537 5412 2683  
## 2 899740 5440 904  
## 3 55688 368 3717  
## 4 63728 425 1721  
## 5 822012 4942 3697  
## 6 781895 4668 2011

# Get ratings list  
rec\_list<-as(recom,"list")  
head(summary(rec\_list))

## Length Class Mode   
## 1 3638 -none- numeric  
## 2 3576 -none- numeric  
## 3 3637 -none- numeric  
## 4 3658 -none- numeric  
## 5 3536 -none- numeric  
## 6 3623 -none- numeric

ratings<-NULL  
# For all lines in test file, one by one  
for ( u in 1:length(test[,2]))  
{  
 # Read userid and movieid from columns 2 and 3 of test data  
 userid <- test[u,2]  
 movieid<-test[u,3]  
   
 # Get as list & then convert to data frame all recommendations for user: userid  
 u1<-as.data.frame(rec\_list[[userid]])  
 # Creating a (second column) column-id in the data-frame u1 and populate it with row-names  
 # We use row.names() function  
 u1$id<-row.names(u1)  
 # Now access movie ratings in column 1 of u1  
 x= u1[u1$id==movieid,1]  
 # print(u)  
 # print(length(x))  
 # If no ratings were found, assign 0.   
 if (length(x)==0)  
 {  
 ratings[u] <- 0  
 }  
 else  
 {  
 ratings[u] <-x  
 }  
   
}  
length(ratings)

## [1] 250053

tx<-cbind(test[,1],round(ratings))  
# Write to a csv file  
write.table(tx,file="Finalfile.csv",row.names=FALSE,col.names=FALSE,sep=',')