

# **Web Science: Assignment #6**

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## Problem 1

The goal of this project is to use the basic recommendation principles we have learned for user-collected data. You will modify the code given to you which performs movie recommendations from the MovieLense data sets. (<https://github.com/arthur-e/Programming-Collective-Intelligence/blob/master/chapter2/recommendations.py>) The MovieLense data sets were collected by the GroupLens Research Project at the University of Minnesota during the seven-month period from September 19th, 1997 through April 22nd, 1998. We are using the "100k dataset", available for download from: <http://grouplens.org/datasets/movielens/100k/>

There are three files which we will use:

1. u.data: 100,000 ratings by 943 users on 1,682 movies. Each user has rated at least 20 movies. Users and items are numbered consecutively from 1. The data is randomly ordered.
2. u.item: Information about the 1,682 movies.
3. u.user: Demographic information about the users.

Find 3 users who are closest to you in terms of age, gender, and occupation. For each of those 3 users:

1. what are their top 3 favorite films?
2. bottom 3 least favorite films?

Based on the movie values in those 6 tables (3 users X (favorite + least)), choose a user that you feel is most like you. Feel free to note any outliers (e.g., "I mostly identify with user 123, except I did not like "Ghost" at all").

This user is the "substitute you".

**SOLUTION :**

I have solved the problem as described in the below steps :

1. I have set the parameters, 'Age', 'Gender' and 'Occupation' as '27', 'M', 'Student' respectively.
2. Identified the matching users from **u.user** dataset, i received 6 such users.
3. Chose 3 users with following Ids : **758, 429, 104**

Listing 1: approximateUser.py

```
from operator import itemgetter

matchingUsers = []
myAge = 27
5 myOccupation = 'student'
myGender = 'M'
userMoviesDict = {}
userMovieRatingDict = {}
finalTopThree = {}
10 finalBottomThree = {}
userMovieRatingsList = []
movieRatingsList = []
matches = ''
bottomCount = 0
15 topCount = 0
listSize = 0

with open('users.txt', 'r') as f1:
    for line in f1:
        20     userId,age,gender,occupation,zipcode = line.split('|')
        if((int(age) == myAge) and (gender == myGender) and
            (occupation == myOccupation)):
            matchingUsers.append(userId)

25 print matchingUsers

with open('data.txt', 'r') as f2:
    for line in f2:
        userId,movieId,rating,mseconds = line.split(' ')
        30     if(userId in matchingUsers):
            if(userId in userMoviesDict):
                userMoviesDict[userId] = userMoviesDict[userId] + ":"
                + movieId + "|" + rating
            else :
                35     userMoviesDict[userId] = movieId + "|" + rating

print('-----')
for key, value in userMoviesDict.items():
    userMovieRatingsList = userMoviesDict[key].split(":")
    40     for movieRating in userMovieRatingsList:
        movie,rating = movieRating.split("|")
        userMovieRatingDict[movie] = rating
        # print(movie,rating)
```

```

45     sortedRatings = sorted(userMovieRatingDict.items(),
                             key=lambda value: value[1])
    # print("Length :",len(sortedRatings))
    bottomCount = 0
    topCount = 0
50    listSize = 0
    bottomMovieData = ""
    topMovieData = ""
    for data in sortedRatings:
        listSize = listSize + 1
55        if (bottomCount < 3):
            if (bottomMovieData == ""):
                bottomMovieData = str(data)
            else :
                bottomMovieData = bottomMovieData + ":" + str(data)
60        bottomCount = bottomCount + 1
        if (listSize > len(sortedRatings) - 3):
            if (topMovieData == ""):
                topMovieData = str(data)
            else :
65                topMovieData = topMovieData + ":" + str(data)

    finalBottomThree[key] = bottomMovieData
    finalTopThree[key] = topMovieData
    print('-----')
70    print(finalTopThree)
    print(finalBottomThree)
    print('\n')

print "User" + " " + "Movie Title" + " " + "Rating"
75 print "----" + " " + "-----" + " " + "-----"
for key, value in finalTopThree.items():
    movieTuple = finalTopThree[key].split(":")
    for movie in movieTuple:
        movieId,rating = str(movie).split(",")
80        movieId = movieId.replace("(", "").replace("'", "")
        with open('item.txt', 'r') as file:
            for line in file:
                mid,movieTitle = line.split("|")[0:2]
                if (mid == movieId):
85                    print key, " " + movieTitle + " " +
                        rating.replace(" ", "").replace("'", "")

print ('\n')

90 print "User" + " " + "Movie Title" + " " + "Rating"
print "----" + " " + "-----" + " " + "-----"
for key, value in finalBottomThree.items():
    movieTuple = finalBottomThree[key].split(":")
    for movie in movieTuple:
95        movieId,rating = str(movie).split(",")
        movieId = movieId.replace("(", "").replace("'", "")

```

100

```

with open('item.txt', 'r') as file:
    for line in file:
        mid,movieTitle = line.split("|")[0:2]
        if (mid == movieId):
            print key, " " + movieTitle + " " +
                  rating.replace(" ", "").replace("'", "")

```

The above code, will generate top 3 favorite and bottom 3 least favorite movies from the selected 3 users.

USER	MOVIE	RATING
758	Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb (1963)	5
758	Trainspotting (1996)	5
758	Vertigo (1958)	5
429	Casablanca (1942)	5
429	Tombstone (1993)	5
429	Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb (1963)	5
104	Casablanca (1942)	5
104	Tombstone (1993)	5
104	Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb (1963)	5

Figure 1: Top 3 Favorite Movies

USER	MOVIE	RATING
758	Saint, The (1997)	1
758	Jackal, The (1997)	1
758	Conspiracy Theory (1997)	1
429	Amityville II: The Possession (1982)	1
429	Saint, The (1997)	1
429	Homeward Bound: The Incredible Journey (1993)	1
104	Starship Troopers (1997)	1
104	Con Air (1997)	1
104	Trees Lounge (1996)	1

Figure 2: Bottom 3 Favorite Movies

## Problem 2

2. Which 5 users are most correlated to the substitute you? Which 5 users are least correlated (i.e., negative correlation)?

### SOLUTION

To solve this problem, i have used the code from the text **Programming Collective Intelligence** I have chosen user **429** as '**Substitute Me**' and pass the preferences of the 'Substitute Me' to the **sim\_pearson** function, to determine the nearest 5 users.

Listing 2: correlation.py

```
import csv
import math
import operator
import string
5 from collections import Counter
from math import sqrt

def sim_distance(prefs, p1, p2):
    """
10     Returns a distance-based similarity score for person1 and person2.
    """

    # Get the list of shared_items
    si = {}
15     for item in prefs[p1]:
        if item in prefs[p2]:
            si[item] = 1
    # If they have no ratings in common, return 0
    if len(si) == 0:
20         return 0
    # Add up the squares of all the differences
    sum_of_squares = sum([pow(prefs[p1][item] - prefs[p2][item], 2) for item in
                           prefs[p1] if item in prefs[p2]])
    return 1 / (1 + sqrt(sum_of_squares))
25

def sim_pearson(prefs, p1, p2):
    """
30     Returns the Pearson correlation coefficient for p1 and p2.
    """

    # Get the list of mutually rated items
    si = {}
    for item in prefs[p1]:
35         if item in prefs[p2]:
            si[item] = 1
    # If they are no ratings in common, return 0
    if len(si) == 0:
        return 0
40     # Sum calculations
    n = len(si)
```

```
    # Sums of all the preferences
    sum1 = sum([prefs[p1][it] for it in si])
    sum2 = sum([prefs[p2][it] for it in si])
45    # Sums of the squares
    sum1Sq = sum([pow(prefs[p1][it], 2) for it in si])
    sum2Sq = sum([pow(prefs[p2][it], 2) for it in si])
    # Sum of the products
    pSum = sum([prefs[p1][it] * prefs[p2][it] for it in si])
50    # Calculate r (Pearson score)
    num = pSum - sum1 * sum2 / n
    den = sqrt((sum1Sq - pow(sum1, 2) / n) * (sum2Sq - pow(sum2, 2) / n))
    if den == 0:
        return 0
55    r = num / den
    return r

def topMatches(
60    prefs,
    person,
    n=5,
    similarity=sim_pearson,
):
65    """
    Returns the best matches for person from the prefs dictionary.
    Number of results and similarity function are optional params.
    """

    scores = [(similarity(prefs, person, other), other) for other in prefs
70                if other != person]
    scores.sort()
    scores.reverse()
    return scores[0:n]
75

def getRecommendations(prefs, person, similarity=sim_pearson):
    """
    Gets recommendations for a person by using a weighted average
80    of every other user's rankings
    """

    totals = {}
    simSums = {}
85    for other in prefs:
        # Don't compare me to myself
        if other == person:
            continue
        sim = similarity(prefs, person, other)
90        # Ignore scores of zero or lower
        if sim <= 0:
            continue
        for item in prefs[other]:
            # Only score movies I haven't seen yet
```



```
95         if item not in prefs[person] or prefs[person][item] == 0:
            # Similarity * Score
            totals.setdefault(item, 0)
            # The final score is calculated by multiplying each item by the
            # similarity and adding these products together
100         totals[item] += prefs[other][item] * sim
            # Sum of similarities
            simSums.setdefault(item, 0)
            simSums[item] += sim
        # Create the normalized list
105     rankings = [(total / simSums[item], item) for (item, total) in
                   totals.items()]
        # Return the sorted list
        rankings.sort()
        rankings.reverse()
110     return rankings

def transformPrefs(prefs):
    """
115     Transform the recommendations into a mapping where persons are described
    with interest scores for a given title e.g. {title: person} instead of
    {person: title}.
    """

    result = {}
    for person in prefs:
        for item in prefs[person]:
            result.setdefault(item, {})
            # Flip item and person
125         result[item][person] = prefs[person][item]
    return result

def calculateSimilarItems(prefs, n=10):
    """
130     Create a dictionary of items showing which other items they are
    most similar to.
    """

    result = {}
    # Invert the preference matrix to be item-centric
    itemPrefs = transformPrefs(prefs)
    c = 0
    for item in itemPrefs:
        # Status updates for large datasets
140         c += 1
        if c % 100 == 0:
            print('%d / %d' % (c, len(itemPrefs)))
        # Find the most similar items to this one
145         scores = topMatches(itemPrefs, item, n=n, similarity=sim_distance)
        result[item] = scores
    return result
```

```
150 def getRecommendedItems(prefs, itemMatch, user):
    userRatings = prefs[user]
    scores = {}
    totalSim = {}
    # Loop over items rated by this user
155 for (item, rating) in userRatings.items():
    # Loop over items similar to this one
    for (similarity, item2) in itemMatch[item]:
        # Ignore if this user has already rated this item
        if item2 in userRatings:
160             continue
        # Weighted sum of rating times similarity
        scores.setdefault(item2, 0)
        scores[item2] += similarity * rating
        # Sum of all the similarities
165 totalSim.setdefault(item2, 0)
        totalSim[item2] += similarity
    # Divide each total score by total weighting to get an average
    rankings = [(score / totalSim[item], item) for (item, score) in
                scores.items()]
170 # Return the rankings from highest to lowest
    rankings.sort()
    rankings.reverse()
    return rankings

175

def loadMovieLens():
    # Get movie titles
    movies = {}
180 for line in open('item.txt'):
    (id, title) = line.split('|')[0:2]
    movies[id] = title
    # Load data
    prefs = {}
185 for line in open('data.txt'):
    (user, movieid, rating, ts) = line.split('\t')
    prefs.setdefault(user, {})
    prefs[user][movies[movieid]] = float(rating)
    return prefs

190
prefs = loadMovieLens()

with open('users.txt') as tsv:
    for line in csv.reader(tsv, delimiter=","):
195         p2 = (line[0])
        p1 = '429'
        r = sim_pearson(prefs, p1, p2)
        with open('corrlate.csv', 'a') as f:
            writer=csv.writer(f)
200             writer.writerow([r,p2,p1])
```

The above code will generate **corrlate.csv**, which gives the correlation of all the users in comparison with 'Substitute Me' i.e., user **429**

CORRELATION	USER	Substitute Me
-0.003776158	372	429
-0.001392455	586	429
-0.003747698	924	429
-0.00287144	940	429
-0.092554029	390	429

Figure 3: Negative Correlation

CORRELATION	USER	Substitute Me
0.942809042	813	429
0.9258201	926	429
0.866025404	842	429
0.862068966	443	429
0.87038828	675	429

Figure 4: Positive Correlation

## Problem 3

3. Compute ratings for all the films that the substitute you have not seen. Provide a list of the top 5 recommendations for films that the substitute you should see. Provide a list of the bottom 5 recommendations (i.e., films the substitute you is almost certain to hate).

### SOLUTION

To solve this problem, i have used the code from the text **Programming Collective Intelligence** I have used the **getRecommendations** function to get the recommendations for 'Substitute Me'. The results of the same is saved in to a text file **recommendedMovies.txt**

Listing 3: recommendation.py

```
import csv
import math
import operator
import string
5 from collections import Counter
from math import sqrt

def sim_distance(prefs, p1, p2):
    '''
10     Returns a distance-based similarity score for person1 and person2.
    '''

    # Get the list of shared_items
    si = {}
15     for item in prefs[p1]:
        if item in prefs[p2]:
            si[item] = 1

    # If they have no ratings in common, return 0
    if len(si) == 0:
20         return 0

    # Add up the squares of all the differences
    sum_of_squares = sum([pow(prefs[p1][item] - prefs[p2][item], 2) for item in
                           prefs[p1] if item in prefs[p2]])
    return 1 / (1 + sqrt(sum_of_squares))
25

def sim_pearson(prefs, p1, p2):
    '''
30     Returns the Pearson correlation coefficient for p1 and p2.
    '''

    # Get the list of mutually rated items
    si = {}
    for item in prefs[p1]:
35         if item in prefs[p2]:
            si[item] = 1

    # If they are no ratings in common, return 0
    if len(si) == 0:
        return 0
40     # Sum calculations
```

```

n = len(si)
# Sums of all the preferences
sum1 = sum([prefs[p1][it] for it in si])
sum2 = sum([prefs[p2][it] for it in si])
45 # Sums of the squares
sum1Sq = sum([pow(prefs[p1][it], 2) for it in si])
sum2Sq = sum([pow(prefs[p2][it], 2) for it in si])
# Sum of the products
pSum = sum([prefs[p1][it] * prefs[p2][it] for it in si])
50 # Calculate r (Pearson score)
num = pSum - sum1 * sum2 / n
den = sqrt((sum1Sq - pow(sum1, 2) / n) * (sum2Sq - pow(sum2, 2) / n))
if den == 0:
    return 0
55 r = num / den
return r

def topMatches(prefs, person, n=5, similarity=sim_pearson):
60 """
    Returns the best matches for person from the prefs dictionary.
    Number of results and similarity function are optional params.
    """

    scores = [(similarity(prefs, person, other), other) for other in prefs
              if other != person]
    scores.sort()
    scores.reverse()
    return scores[0:n]
70

def getRecommendations(prefs, person, similarity=sim_pearson):
    """
    Gets recommendations for a person by using a weighted average
    of every other user's rankings
    """

    totals = {}
    simSums = {}
    80 for other in prefs:
        # Don't compare me to myself
        if other == person:
            continue
        sim = similarity(prefs, person, other)
        85 # Ignore scores of zero or lower
        if sim <= 0:
            continue
        for item in prefs[other]:
            # Only score movies I haven't seen yet
            90 if item not in prefs[person] or prefs[person][item] == 0:
                # Similarity * Score
                totals.setdefault(item, 0)
                # The final score is calculated by multiplying each item by the

```

```

    # similarity and adding these products together
    totals[item] += prefs[other][item] * sim
    # Sum of similarities
    simSums.setdefault(item, 0)
    simSums[item] += sim
    # Create the normalized list
    rankings = [(total / simSums[item], item) for (item, total) in
    totals.items()]
    # Return the sorted list
    rankings.sort()
    rankings.reverse()
    return rankings

def transformPrefs(prefs):
    """
    Transform the recommendations into a mapping where persons are described
    with interest scores for a given title e.g. {title: person} instead of
    {person: title}.
    """
    result = {}
    for person in prefs:
        for item in prefs[person]:
            result.setdefault(item, {})
            # Flip item and person
            result[item][person] = prefs[person][item]
    return result

def calculateSimilarItems(prefs, n=10):
    """
    Create a dictionary of items showing which other items they are
    most similar to.
    """
    result = {}
    # Invert the preference matrix to be item-centric
    itemPrefs = transformPrefs(prefs)
    c = 0
    for item in itemPrefs:
        # Status updates for large datasets
        c += 1
        if c % 100 == 0:
            print('%d / %d' % (c, len(itemPrefs)))
        # Find the most similar items to this one
        scores = topMatches(itemPrefs, item, n=n, similarity=sim_distance)
        result[item] = scores
    return result

def getRecommendedItems(prefs, itemMatch, user):
    userRatings = prefs[user]
```

```
150     scores = {}
151     totalSim = {}
152     # Loop over items rated by this user
153     for (item, rating) in userRatings.items():
154         # Loop over items similar to this one
155         for (similarity, item2) in itemMatch[item]:
156             # Ignore if this user has already rated this item
157             if item2 in userRatings:
158                 continue
159             # Weighted sum of rating times similarity
160             scores.setdefault(item2, 0)
161             scores[item2] += similarity * rating
162             # Sum of all the similarities
163             totalSim.setdefault(item2, 0)
164             totalSim[item2] += similarity
165             # Divide each total score by total weighting to get an average
166             rankings = [(score / totalSim[item], item) for (item, score) in
167                         scores.items()]
168             # Return the rankings from highest to lowest
169             rankings.sort()
170             rankings.reverse()
171             return rankings
172
173 def loadMovieLens():
174     # Get movie titles
175     movies = {}
176     for line in open('item.txt'):
177         (id, title) = line.split('|')[0:2]
178         movies[id] = title
179     # Load data
180     prefs = {}
181     for line in open('data.txt'):
182         (user, movieid, rating, ts) = line.split('\t')
183         prefs.setdefault(user, {})
184         prefs[user][movies[movieid]] = float(rating)
185         print prefs[user][movies[movieid]]
186     return prefs
187
188 prefs = loadMovieLens()
189
190 userId = '429'
191 r = getRecommendations(prefs, userId)
192 f = open("recommendedMovies.txt", "w")
193 f.write(str(r))
194 f.close()
```

The above code will generate recommendations for **Substitute Me** in saves in to text file **recommended-Movies.txt**.

Top 5 Recommendations
Boys, Les (1997)
They Made Me a Criminal (1939)
Star Kid (1997)
Someone Else's America (1995)
Santa with Muscles (1996)

Figure 5: Top 5 Recommended Movies

Bottom 5 Recommendations
August (1996)
Amityville: Dollhouse (1996)
Amityville: A New Generation (1993)
3 Ninjas: High Noon At Mega Mountain (1998)
Amityville 1992: It's About Time (1992)

Figure 6: Bottom 5 Recommended Movies



## Problem 4

4. Choose your (the real you, not the substitute you) favorite and least favorite film from the data. For each film, generate a list of the top 5 most correlated and bottom 5 least correlated films. Based on your knowledge of the resulting films, do you agree with the results? In other words, do you personally like / dislike the resulting films?

### SOLUTION

To solve this problem, i have used the code from the text **Programming Collective Intelligence** I have used the **transformPrefs** function to change the preferences and get the top 5 suggestions from the **topMatches** function. The results for my favorite movie **Star Wars** and my least favorite movie **Jurassic Park** has been determined with positive and negative correlations

Listing 4: movieCorrelation.py

```
import csv
import math
import operator
import string
5 from collections import Counter
from math import sqrt

def sim_distance(prefs, p1, p2):
    """
10     Returns a distance-based similarity score for person1 and person2.
    """

    # Get the list of shared_items
    si = {}
15     for item in prefs[p1]:
        if item in prefs[p2]:
            si[item] = 1
    # If they have no ratings in common, return 0
    if len(si) == 0:
20         return 0
    # Add up the squares of all the differences
    sum_of_squares = sum([pow(prefs[p1][item] - prefs[p2][item], 2) for item in
                           prefs[p1] if item in prefs[p2]])
    return 1 / (1 + sqrt(sum_of_squares))
25

def sim_pearson(prefs, p1, p2):
    """
30     Returns the Pearson correlation coefficient for p1 and p2.
    """

    # Get the list of mutually rated items
    si = {}
    for item in prefs[p1]:
35         if item in prefs[p2]:
            si[item] = 1
    # If they are no ratings in common, return 0
    if len(si) == 0:
```

```

    return 0
40  # Sum calculations
    n = len(si)
    # Sums of all the preferences
    sum1 = sum([prefs[p1][it] for it in si])
    sum2 = sum([prefs[p2][it] for it in si])
45  # Sums of the squares
    sum1Sq = sum([pow(prefs[p1][it], 2) for it in si])
    sum2Sq = sum([pow(prefs[p2][it], 2) for it in si])
    # Sum of the products
    pSum = sum([prefs[p1][it] * prefs[p2][it] for it in si])
50  # Calculate r (Pearson score)
    num = pSum - sum1 * sum2 / n
    den = sqrt((sum1Sq - pow(sum1, 2) / n) * (sum2Sq - pow(sum2, 2) / n))
    if den == 0:
        return 0
55  r = num / den
    return r

def topMatches(
60  prefs,
    person,
    n=5,
    similarity=sim_pearson,
):
65  """
    Returns the best matches for person from the prefs dictionary.
    Number of results and similarity function are optional params.
    """

70  scores = [(similarity(prefs, person, other), other) for other in prefs
              if other != person]
    scores.sort()
    # scores.reverse()
    # return scores[0:n]
75  lessfavorite = scores[:n]
    favorite = scores[-n:]
    return (lessfavorite, favorite)

80 def getRecommendations(prefs, person, similarity=sim_pearson):
    """
    Gets recommendations for a person by using a weighted average
    of every other user's rankings
    """
85
    totals = {}
    simSums = {}
    for other in prefs:
        # Don't compare me to myself
90        if other == person:
            continue
```

```
sim = similarity(prefs, person, other)
# Ignore scores of zero or lower
if sim <= 0:
    continue
for item in prefs[other]:
    # Only score movies I haven't seen yet
    if item not in prefs[person] or prefs[person][item] == 0:
        # Similarity * Score
        totals.setdefault(item, 0)
        # The final score is calculated by multiplying each item by the
        # similarity and adding these products together
        totals[item] += prefs[other][item] * sim
        # Sum of similarities
        simSums.setdefault(item, 0)
        simSums[item] += sim
# Create the normalized list
rankings = [(total / simSums[item], item) for (item, total) in
             totals.items()]
# Return the sorted list
rankings.sort()
rankings.reverse()
return rankings

def transformPrefs(prefs):
    """
    Transform the recommendations into a mapping where persons are described
    with interest scores for a given title e.g. {title: person} instead of
    {person: title}.
    """
    result = {}
    for person in prefs:
        for item in prefs[person]:
            result.setdefault(item, {})
            # Flip item and person
            result[item][person] = prefs[person][item]
    return result

def calculateSimilarItems(prefs, n=10):
    """
    Create a dictionary of items showing which other items they are
    most similar to.
    """
    result = {}
    # Invert the preference matrix to be item-centric
    itemPrefs = transformPrefs(prefs)
    c = 0
    for item in itemPrefs:
        # Status updates for large datasets
        c += 1
```

```
145         if c % 100 == 0:
            print('%d / %d' % (c, len(itemPrefs)))
            # Find the most similar items to this one
            scores = topMatches(itemPrefs, item, n=n, similarity=sim_distance)
            result[item] = scores
150     return result

def getRecommendedItems(prefs, itemMatch, user):
    userRatings = prefs[user]
155     scores = {}
    totalSim = {}
    # Loop over items rated by this user
    for (item, rating) in userRatings.items():
        # Loop over items similar to this one
160         for (similarity, item2) in itemMatch[item]:
            # Ignore if this user has already rated this item
            if item2 in userRatings:
                continue
            # Weighted sum of rating times similarity
165             scores.setdefault(item2, 0)
            scores[item2] += similarity * rating
            # Sum of all the similarities
            totalSim.setdefault(item2, 0)
            totalSim[item2] += similarity
170         # Divide each total score by total weighting to get an average
        rankings = [(score / totalSim[item], item) for (item, score) in
                     scores.items()]
        # Return the rankings from highest to lowest
        rankings.sort()
175         rankings.reverse()
    return rankings

def loadMovieLens():
180     # Get movie titles
    movies = {}
    for line in open('item.txt'):
        (id, title) = line.split('|')[0:2]
        movies[id] = title
185     # Load data
    prefs = {}
    for line in open('data.txt'):
        (user, movieid, rating, ts) = line.split('\t')
        prefs.setdefault(user, {})
190         prefs[user][movies[movieid]] = float(rating)
    return prefs

prefs = loadMovieLens()
prefs = transformPrefs(prefs)
195 (less, high) = topMatches(prefs, 'Star Wars (1977)')
f = open("moviePositiveCorrelation.txt", "w")
f.write(str(less))
```

```

f.write('\n')
f.write(str(high))
200
(less, high) = topMatches(prefs, 'Jurassic Park (1993)')
f = open("moviePositiveCorrelation.txt", "w")
f.write(str(less))
f.write('\n')
205 f.write(str(high))

```

The above code will generate top 5 and bottom 5 recommendations for my favorite and least favorite movies and are saved in to **moviePositiveCorrelation.txt** and **movieNegativeCorrelation.txt** text files.

Correlation	Movie
1.0	Traveller (1997)
1.0	Two Much (1996)
1.0	Vermin (1998)
1.0	The Wedding Gift (1994)
1.0	Loch Ness (1995)

Figure 7: Top 5 Least Favorite Recommendations

Correlation	Movie
-1.00000000000000018	Kaspar Hauser (1993)
-1.0	1-900 (1994)
-1.0	American Dream (1990)
-1.0	Anna (1996)
-1.0	Aparajito (1956)

Figure 8: Bottom 5 Least Favorite Recommendations

Correlation	Movie
-1.00000000000000004	Roseanna's Grave (For Roseanna) (1997)
-1.00000000000000018	Year of the Horse (1997)
-1.00000000000000007	I Like It Like That (1994)
-1.0	American Dream (1990)
-1.0	Der Bewegte Mann

Figure 9: Bottom 5 Favorite Recommendations

Correlation	Movie
1.0000000000000007	Hollow Reed (1996)
1.0000000000000001	Designated Mourner, The (1997)
1.0000000000000013	Commandments (1997)
1.0000000000000013	Escape (1994)
1.0000000000000004	Cosi (1996)

Figure 10: Top 5 Favorite Recommendations

**Conclusion** To review the results obtained from the Correlations ; Im not sure about most of the movies here as i have not watched them, but did watch the part of **American Dream** and did not seem interesting to me.

#### References

1. <https://github.com/arthur-e/Programming-Collective-Intelligence>
2. <http://grouplens.org/datasets/movielens/100k/>