Project Report

on

GlobeTrotter: An Optimal Travel Sequence generator

submitted in partial fulfillment of the requirement
for the award of the Degree of

Bachelor of Engineering
in
Information Technology

by

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2017-2018

Certificate

This is to certify that the Project entitled ”GlobeTrotter: An Optimal Travel Sequence Generator” has been completed successfully by Mr.Saurabh Adhau , Mr. Taufiq Monghal and Ms. Shubhangi Shinde under the guidance of Prof. Varsha Hole for the award of Degree of Bachelor of Engineering in Information Technology from University of Mumbai.

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2017-2018

Project Approval Certificate

This is to certify that the Project entitled “Globetrotter: An Optimal Travel Sequence generator” by Mr. Saurabh Adhau, Mr. Taufiq Monghal and Ms. Shubhangi Shinde is approved for the award of Degree of Bachelor of Engineering in Electronics Engineering from University of Mumbai.

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(signature)	**(signature)**
Name:	**Name:**
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Seal of the Institute

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Abstract

The ready-made fixed packages provided by travel firms has always been a setback when tourists sought to find for a travel experience that are customized to their own needs. The situation than demands for a recommendation system that provides with a tailor made optimized travel sequence for the travellers. For optimizing this orienteering problem we make use of Evolutionary algorithms that consists of two popular meta-heuristics techniques; Ant Colony Optimization (ACO) and Genetic Algorithm (GA). In this work, we try to apply both techniques to create optimal travel route and compare them to determine the best one. The comparison is then accomplished to state the better one that is used in the recommendation system.

Chapter 1

Introduction

1.1 Problem Statement

In the current scenario, fixed travel itineraries are provided to the customers by the travel agencies with less or no consent of the user, while deciding the complete itinerary for any tour. Such itineraries directly affect the user experience since there is no dynamicity in accordance to factors like the time of the year or weather conditions. This problem persists with most of the current travel agencies who resort to traditional methods which needs to be addressed. The above problem will be eliminated by GlobeTrotter which provides optimal travel sequence which includes a recommendation system to recommend popular places of a specific area, that the user may want to visit. This will eventually make the customer more satisfied as compared to the previous scenario. Later, the sequence points of visit specified by the user will undergo optimization to generate optimal itineraries.

1.2 Literature Survey

- Aris Anagnostopoulos, et al. Tour recommendation for groups, Received: 13 January 2016 / Accepted: 2 September 2016:
  In this paper, the authors have formalized the group tour recommendation problem as a generalization of the orienteering problem. They consider several optimization objectives that provide a mathematical formulation to quantify the satisfaction of a group of people, which depends on the satisfaction of its members.

- Lin Yuanyuan, Zhang Jing, An Application of Ant Colony Optimization Algorithm in TSP, Fifth International Conference on Intelligent Networks and Intelligent Systems 2012:
  This paper has made a detailed analysis of the Ant Colony Algorithm and its parameters, and have integrated the algorithm with the TSP(Travelling Salesman problem).They have constructed the mathematical model of ant colony optimization algorithm proposed on the basis of the analysis to solve the TSP problems

- Fabiana Lorenzi, et al. Personal Tour: a recommender system for travel packages, ACM International Conferences on Web Intelligence and Intelligent Agent Technology, 2011:
  This paper describes the Personal Tour recommender system that helps customers to find best travel packages according to their preferences.preferences. Personal Tour is based on the paradigm of a customer recommendation request is divided into partial recommendations that are handled by different agents.

- Gohar Vahdati, et al. A New Approach to Solve Traveling Salesman Problem Using Genetic Algorithm Based on Heuristic Crossover and Mutation Operator , International Conference of Soft Computing and Pattern Recognition,2009
  This paper proposes a new solution for Traveling Salesman Problem (TSP), using genetic algorithm. A heuristic crossover and mutation operation have been proposed to prevent premature convergence.

- Gao Shang, et al. Solving Traveling Salesman Problem by Ant Colony Optimization Algorithm with Association Rule, Third International Conference on Natural Computation (ICNC 2007).
  This paper proposes a new algorithm which integrates ACO and AR(Association Rule) to solve TSP problems since Association is the key in knowledge in data mining for finding the best data sequence

1.3 Scope

- Comparison between the two optimization algorithms Ant Colony Optimization (ACO) and Genetic Algorithm (GA) using explicit data.
- A recommendation system to recommend a list of popular areas.
  - The area that the user wants to travel may be users location at that instant or it may a manual input location by the user.
  - This location will be used by the recommendation system to recommend a list of popular places to the user dynamically.
  - Various travel based constraints such as time and budget will be taken as input after the user selects from certain recommendations.
- Deploying the most suitable Optimisation Algorithm of the two to generate a travel sequence i.e an itinerary.

1.4 Assumptions

- Generalized data has been used for comparing the two algorithms thus results may vary with stricter data.
- The preference to user behaviour i.e popularity, distance,time and budget is equally distributed when creating the travel sequence.
- The preference to user behaviour i.e popularity, distance,time and budget is equally distributed when creating the travel sequence.

1.5 Constraints

- The places available for recommendation are only restricted to certain cities in India
- Since preferences are equalized one specific attribute will not procure heavy weightage in optimisation.
- The base used will be a web portal hence quality might deteriorate if used on mobile handsets.

Chapter 2

Analysis

2.1 Architecture Diagram

The system consists of following major components namely:
1. A recommendation system to recommend a list of popular areas.
2. Optimizer to generate an optimal travel sequence.

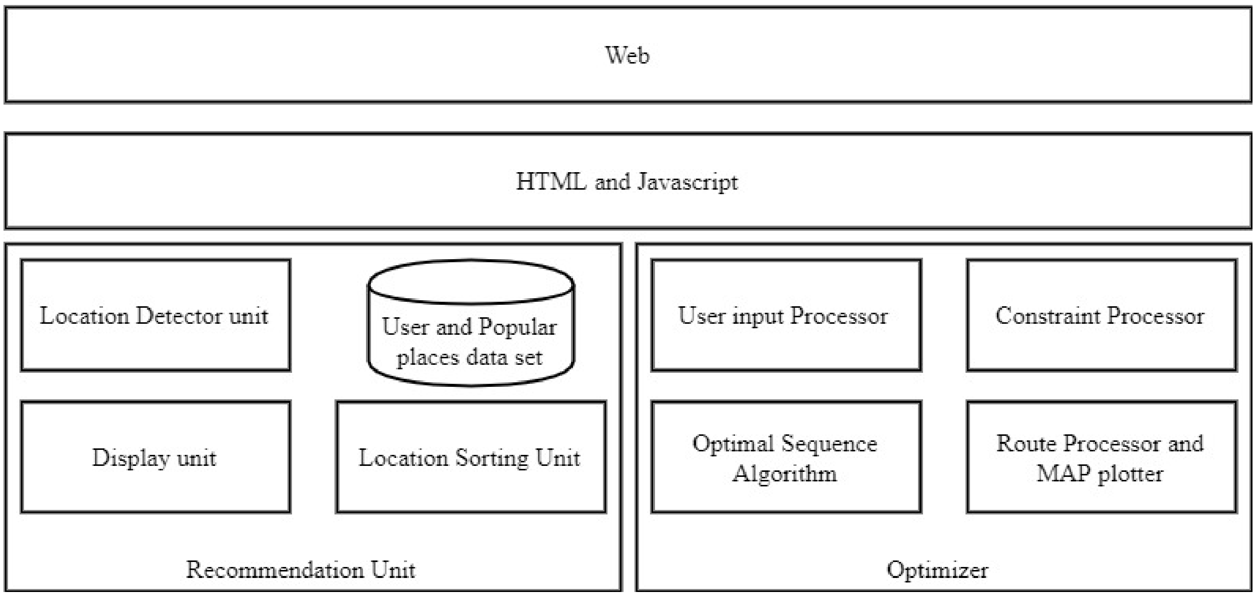


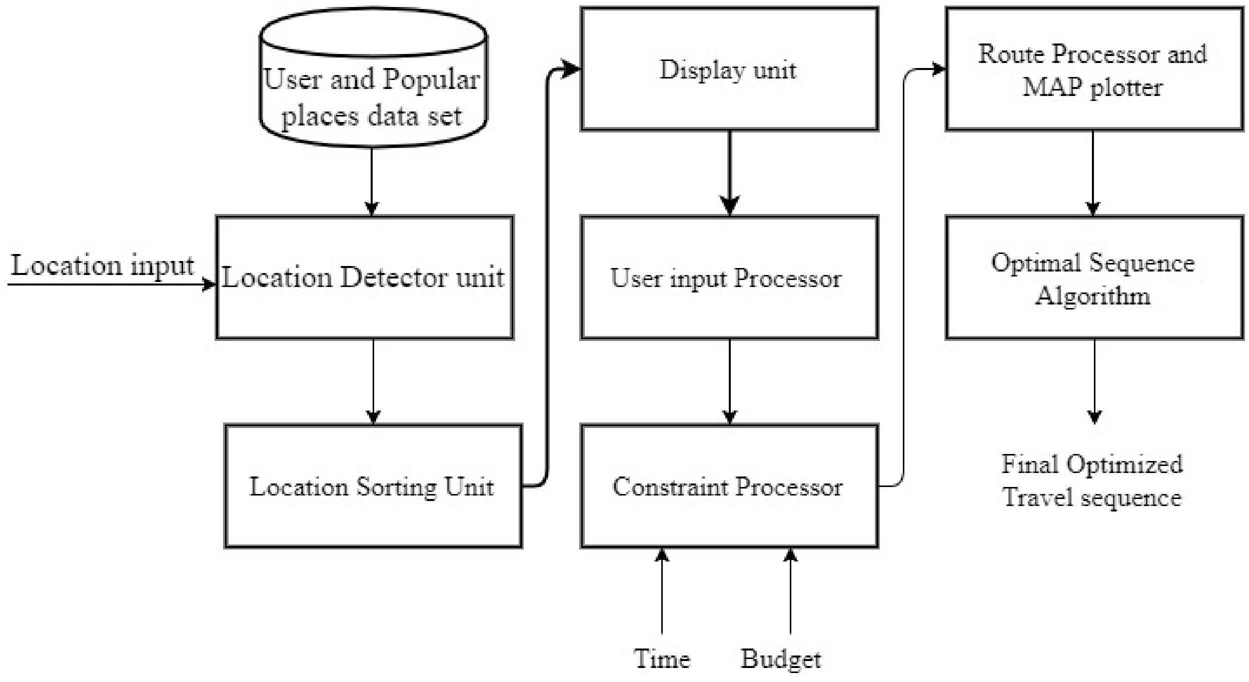
Figure 2.1: Architecture Diagram

- **Location Detector Unit:** Takes explicit city input location or detects it using GPS
- **Location Sorting Unit:** Based on dataset, provides a list of recommendations, sorted based on popularity
- **Display Unit:** Presents the sorted list to user.
- **User input processor:** User selected sub-list is processed.
- **Time and Budget constraint processor:** The time and budget constraint is processed. The cost constraint shall be considered by using per km cab fare and time

constraint shall be predicted using distance and real time traffic conditions. Places are dropped if needed, as per computations in this block.

- **Route Processor and MAP plotter:** Route points are processed and MAP is configured to display results.
- **Optimal Sequence Algorithm:** The relevant heuristic is then used to calculate optimal sequence for the user.

2.2 System Flow Diagram



User and Popular places data set
Location input
Location Detector unit
Location Sorting Unit
Display unit
User input Processor
Constraint Processor
Time
Budget
Route Processor and MAP plotter
Optimal Sequence Algorithm
Final Optimized Travel sequence

Figure 2.2: System Flow Diagram Diagram

Firstly, the user enters location input. The Location Detector Unit allows the user to enter explicit city input location or detects it using GPS. Referring the user and popular places data set, the Location Sorting Unit provides a list of recommendations, based on popularity. This list is sent to the display unit for displaying it to the user. From the displayed list, the user then selects a sublist of places that he/she wants to visit. This list is sent to the user input processor. User then inputs the time and budget constraint into the Constraint Processor which is then used by the Route Processor and MAP Plotter to revise the routes and configure the map. The route points are given to the Optimal Sequence Algorithm to finally generate the optimized route.

2.3 Use Case Diagram

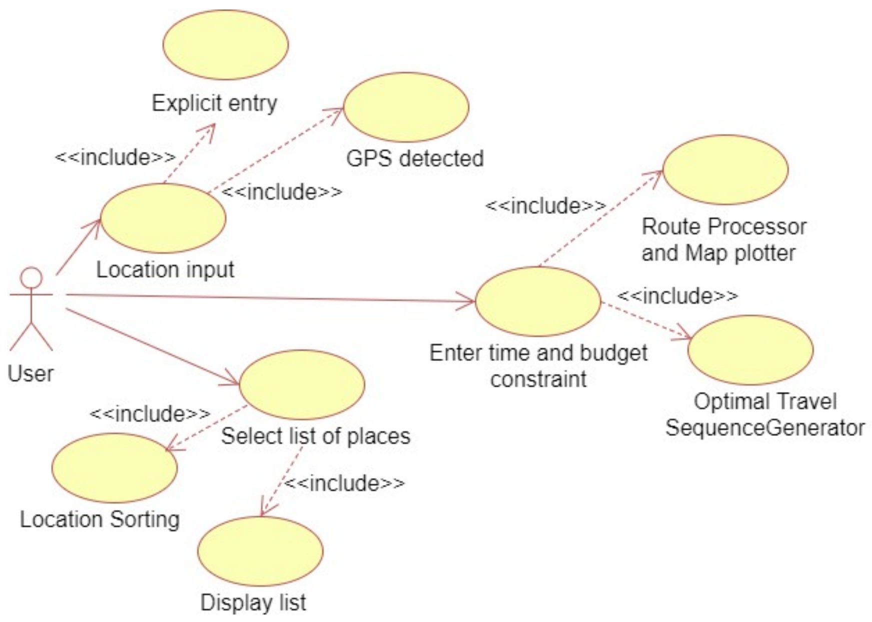


Figure 2.3: Use Case Diagram

2.4 Sequence Diagram

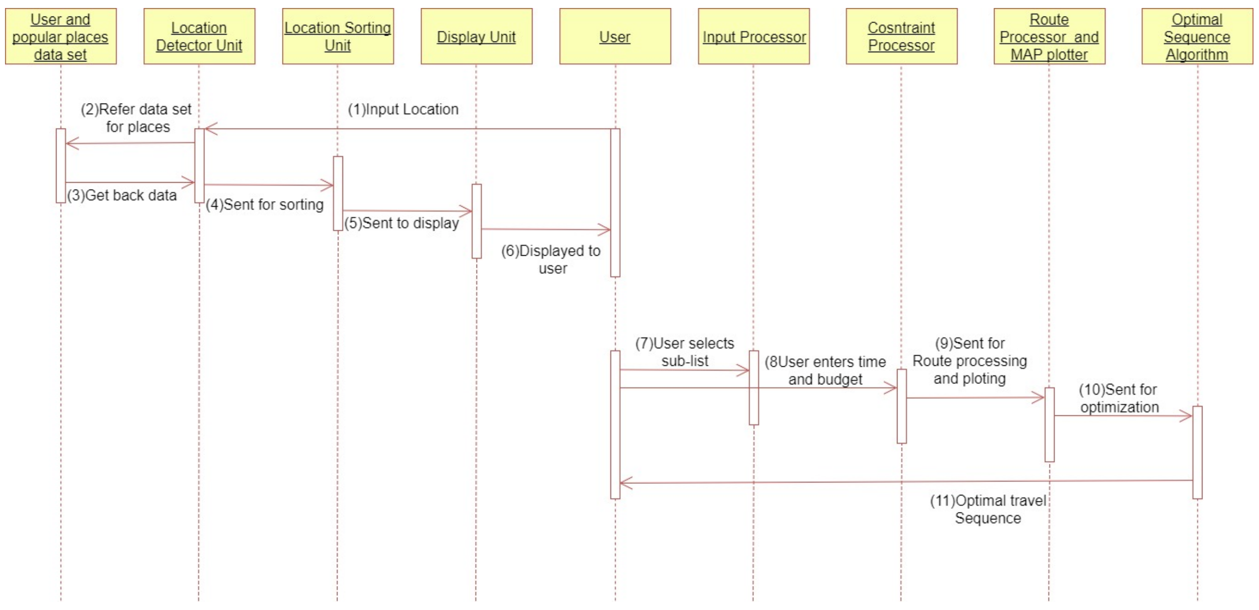

User and popular places data set
Location Detector Unit
Location Sorting Unit
Display Unit
User
Input Processor
Cosntraint Processor
Route Processor and MAP plotter
Optimal Sequence Algorithm
(1)Input Location
(2)Refer data set for places
(3)Get back data
(4)Sent for sorting
(5)Sent to display
(6)Displayed to user
(7)User selects sub-list
(8User enters time and budget
(9)Sent for Route processing and ploting
(10)Sent for optimization
(11)Optimal travel Sequence

Figure 2.4: Sequence Diagram

2.5 Functional Requirements

- Location Detector Unit
  - Input: GPS or manual input
  - Output: Places in the specified location
  - Description: User can either provide the location manually or it can be detected with the help of GPS and then it will find places in the specified location
- Location Sorting Unit
  - Input: Places in the specified location
  - Output: Places will be sorted based on their popularity
  - Description: All the places in the specified location would be found and then based on the popularity all the places will be sorted in descending order.
- Display Unit
  - Input: Sorted list of places
  - Output: Displaying it to user
  - Description: List of sorted places will be displayed to the user
- Constraint Processor
  - Input: Time and Budget
  - Output: Refined Places
  - Description: Along with popularity, time and budget of the user would be taken into consideration and the places would be refined.
- Route Processor
  - Input: Refined Places
  - Output: Shortest routes between all places will be found
  - Description: All refined places will be taken as input, it will find shortest route between all those places
- Optimal Sequence Generator
  - Input: Routes found in previous stage
  - Output: Optimised Routes
  - Description: Routes in the previous stage would be taken as input and those routes would then be optimised to give the final travel sequence.

2.6 Non-functional requirements

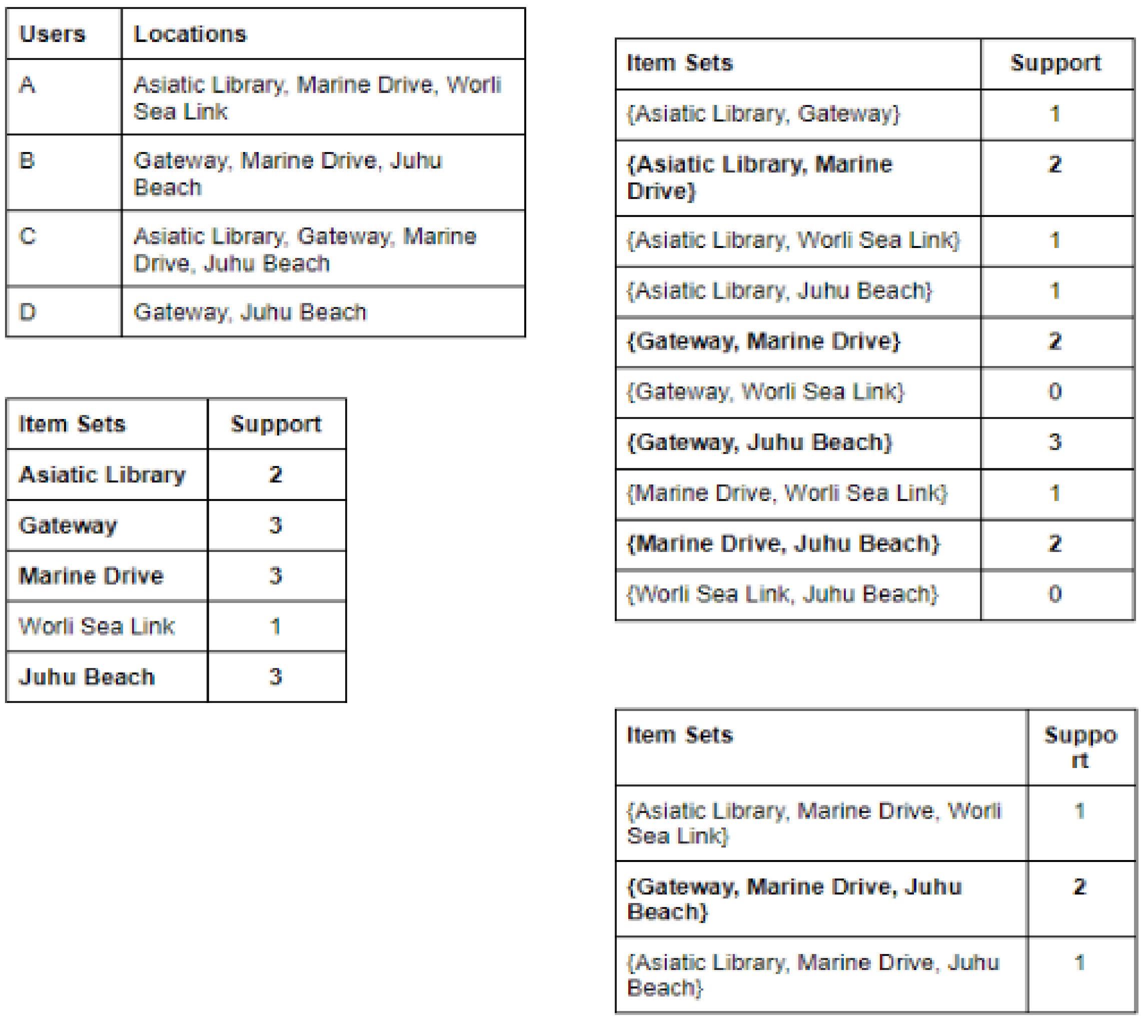
- **Active internet connection**
  The system would require an active internet above 1 Mbps.
- **Loading time**
  The loading time of the portal should be 3-5 seconds.
- **Handling time and budget constraints efficiently**
  The system should be able to give a realistic result considering the time-budget constraints and users input.
- **Accuracy**
  The system should be able to give accurate and optimized results in the form of a travel sequence. The algorithm and the input under consideration has a huge role in deciding the accuracy of the system.
- **Usability**
  The system should be simple to use with a good interface

Chapter 3

Design

3.1 Implementation

- Apriori algorithm flow



Users	**Locations**
A	Asiatic Library, Marine Drive, Worli Sea Link
B	Gateway, Marine Drive, Juhu Beach
C	Asiatic Library, Gateway, Marine Drive, Juhu Beach
D	Gateway, Juhu Beach

Item Sets	**Support**
Asiatic Library	**2**
Gateway	**3**
Marine Drive	**3**
Worli Sea Link	1
Juhu Beach	**3**

Item Sets	**Support**
{Asiatic Library, Gateway}	1
{Asiatic Library, Marine Drive}	**2**
{Asiatic Library, Worli Sea Link}	1
{Asiatic Library, Juhu Beach}	1
{Gateway, Marine Drive}	**2**
{Gateway, Worli Sea Link}	0
{Gateway, Juhu Beach}	3
{Marine Drive, Worli Sea Link}	1
{Marine Drive, Juhu Beach}	**2**
{Worli Sea Link, Juhu Beach}	0

Item Sets	**Suppo rt**
{Asiatic Library, Marine Drive, Worli Sea Link}	1
{Gateway, Marine Drive, Juhu Beach}	**2**
{Asiatic Library, Marine Drive, Juhu Beach}	1

Figure 3.1: Algorithm flow of the implemented Apriori algorithm.

- Code

```
/*
 * File:
 * Input files needed:
 *      1. config.txt - three lines, each line is an integer
 *          line 1 - number of items per transaction
 *          line 2 - number of transactions
 *          line 3 - minsup
 *      2. transa.txt - transaction file, each line is a transaction,
 items are separated by a space
 */


import java.io.*;
import java.util.*;

public class Apriori {

    public static void main(String[] args) {
        AprioriCalculation ap = new AprioriCalculation();

        ap.aprioriProcess();
    }
}
  //Class Name   : AprioriCalculation
 //Purpose      : generate Apriori itemsets

class AprioriCalculation
{
    Vector<String> candidates=new Vector<String>(); //the current candidates
    String configFile="config.txt"; //configuration file
    String transaFile="transa.txt"; //transaction file
    String outputFile="apriori-output.txt";//output file
    int numItems; //number of items per transaction
    int numTransactions; //number of transactions
    double minSup; //minimum support for a frequent itemset
    String oneVal[]; //array of value per column that will be treated as
    // a '1'
    String itemSep = " "; //the separator value for items in the database


     //Method Name  : aprioriProcess
     //Purpose      : Generate the apriori itemsets

 public void aprioriProcess()
    {
```

```
    Date d; //date object for timing purposes
    long start, end; //start and end time
    int itemsetNumber=0; //the current itemset being looked at
    //get config
    getConfig();

    System.out.println("Apriori algorithm has started.\n");

    //start timer
    d = new Date();
    start = d.getTime();

    //while not complete
    do
    {
        //increase the itemset that is being looked at
        itemsetNumber++;

        //generate the candidates
        generateCandidates(itemsetNumber);

        //determine and display frequent itemsets
        calculateFrequentItemsets(itemsetNumber);
        if(candidates.size()!=0)
        {
            System.out.println("Frequent " + itemsetNumber +
            "-itemsets");
            System.out.println(candidates);
        }
    //if there are <=1 frequent items, then its the end. This prevents
    reading through the database again.
    When there is only one frequent itemset.

    }while(candidates.size()>1);

    //end timer
    d = new Date();
    end = d.getTime();

    //display the execution time
    System.out.println("Execution time is:
    "+((double)(end-start)/1000) + " seconds.");
}


 // Method Name  : getInput
 // Purpose      : get user input from System.in
```

```
public static String getInput()
{
    String input="";
    //read from System.in
    BufferedReader reader = new BufferedReader(new
    InputStreamReader(System.in));

    //try to get users input, if there is an error print the message
    try
    {
        input = reader.readLine();
    }
    catch (Exception e)
    {
        System.out.println(e);
    }
    return input;
}

// Method Name  : getConfig
 // Purpose      : get the configuration information (config filename,
 transaction filename)

private void getConfig()
{
    FileWriter fw;
    BufferedWriter file_out;

    try
    {
         FileInputStream file_in = new FileInputStream(configFile);
         BufferedReader data_in = new BufferedReader(new
         InputStreamReader(file_in));
         //number of items
         numItems=Integer.valueOf(data_in.readLine()).intValue();

         //number of transactions
         numTransactions=Integer.valueOf(data_in.readLine()).intValue();

         //minsup
         minSup=(Double.valueOf(data_in.readLine()).doubleValue());

         //output config info to the user
         System.out.print("\nInput configuration: "+numItems+" items,
         "+numTransactions+" transactions, ");
         System.out.println("minsup = "+(minSup*4)+"%");
```

```
                System.out.println();
                minSup/=100.0;

               oneVal = new String[numItems];

for(int i=0; i<oneVal.length; i++)
                   oneVal[i]="1";

            //create the output file
            fw= new FileWriter(outputFile);
            file_out = new BufferedWriter(fw);
            //put the number of transactions into the output file
            file_out.write(numTransactions + "\n");
            file_out.write(numItems + "\n******\n");
            file_out.close();
        }
        //if there is an error, print the message
        catch(IOException e)
        {
            System.out.println(e);
        }
    }

//Method Name  : generateCandidates
     // Purpose      : Generate all possible candidates for the n-th
     itemsets

    private void generateCandidates(int n)
    {
        Vector<String> tempCandidates = new Vector<String>(); //temporary
        candidate string vector
        String str1, str2; //strings that will be used for comparisons
        StringTokenizer st1, st2; //string tokenizers for the two
        itemsets being compared

        //if its the first set, candidates are just the numbers
        if(n==1)
        {
            for(int i=1; i<=numItems; i++)
            {
                tempCandidates.add(Integer.toString(i));
            }
        }
        else if(n==2) //second itemset is just all combinations of itemset 1
        {
            //add each itemset from the previous frequent itemsets together
            for(int i=0; i<candidates.size(); i++)
            {
                st1 = new StringTokenizer(candidates.get(i));
                str1 = st1.nextToken();
                for(int j=i+1; j<candidates.size(); j++)
                {
                    st2 = new StringTokenizer(candidates.elementAt(j));
                    str2 = st2.nextToken();
                    tempCandidates.add(str1 + " " + str2);
                }
            }
        }
        else
        {
            //for each itemset
            for(int i=0; i<candidates.size(); i++)
            {
                //compare to the next itemset
                for(int j=i+1; j<candidates.size(); j++)
                {
                    //create the strigns
                    str1 = new String();
                    str2 = new String();
                    //create the tokenizers
                    st1 = new StringTokenizer(candidates.get(i));
                    st2 = new StringTokenizer(candidates.get(j));

                    //make a string of the first n-2 tokens of the strings
                    for(int s=0; s<n-2; s++)
                    {
                        str1 = str1 + " " + st1.nextToken();
                        str2 = str2 + " " + st2.nextToken();
                    }

                    //if they have the same n-2 tokens, add them together
                    if(str2.compareToIgnoreCase(str1)==0)
                        tempCandidates.add((str1 + " " + st1.nextToken()
                        + " " + st2.nextToken()).trim());
                }
            }
        }
        //clear the old candidates
        candidates.clear();
        //set the new ones
        candidates = new Vector<String>(tempCandidates);
        tempCandidates.clear();
    }
```

```
     // Method Name  : calculateFrequentItemsets
//Purpose      : Determine which candidates are frequent in the n-th itemsets

    private void calculateFrequentItemsets(int n)
    {
        Vector<String> frequentCandidates = new Vector<String>(); //the
        frequent candidates for the current itemset
        FileInputStream file_in; //file input stream
        BufferedReader data_in; //data input stream
        FileWriter fw;
        BufferedWriter file_out;

        StringTokenizer st, stFile; //tokenizer for candidate and transaction
        boolean match; //whether the transaction has all the items
        in an itemset
        boolean trans[] = new boolean[numItems]; //array to hold a
        transaction so that can be checked
        int count[] = new int[candidates.size()]; //the number of
        successful matches

        try
        {
                //output file
                fw= new FileWriter(outputFile, true);
                file_out = new BufferedWriter(fw);
                //load the transaction file
                file_in = new FileInputStream(transaFile);
                data_in = new BufferedReader(new InputStreamReader(file_in));

                //for each transaction
                for(int i=0; i<numTransactions; i++)
                {
                    //System.out.println("Got here " + i + " times");
                    //useful to debug files that you are unsure of the number
                    stFile = new StringTokenizer(data_in.readLine(), itemSep);
                    //read a line from the file to the tokenizer
                    //put the contents of that line into the transaction
                    array
                    for(int j=0; j<numItems; j++)
                    {
                        trans[j]=(stFile.nextToken().compareToIgnoreCase(
                        oneVal[j])==0);
                        //if it is not a 0, assign the value to true
                    }

                    //check each candidate
                for(int c=0; c<candidates.size(); c++)
                {
                    match = false; //reset match to false
                    //tokenize the candidate so that we know what items
                    need to be present for a match
                    st = new StringTokenizer(candidates.get(c));
                    //check each item in the itemset to see if it
                    is present in the transaction
                    while(st.hasMoreTokens())
                    {
                        match =
                        (trans[Integer.valueOf(st.nextToken())-1]);

                        if(!match) //if it is not present in
                        the transaction stop checking
                            break;
                    }
                    if(match) //if at this point it is a match,
                    increase the count
                        count[c]++;
                }

            }
            for(int i=0; i<candidates.size(); i++)
            {
                //  System.out.println("Candidate: " +
                candidates.get(c) + " with count: " + count
                + " % is: " + (count/(double)numItems));
                //if the count% is larger than the minSup%, add to
                the candidate to the frequent candidates
                if((count[i]/(double)numTransactions)>=minSup)
                {
                    frequentCandidates.add(candidates.get(i));
                    //put the frequent itemset into the output file
                    file_out.write(candidates.get(i) + "," +
                    count[i]/(double)numTransactions + "\n");
                }
            }
            file_out.write("-\n");
            file_out.close();
    }
    //if error at all in this process, catch it and print the error
    message
    catch(IOException e)
    {
        System.out.println(e);
    }
```

```
            //clear old candidates
            candidates.clear();
            //new candidates are the old frequent candidates
            candidates = new Vector<String>(frequentCandidates);
            frequentCandidates.clear();
        }
    }
```

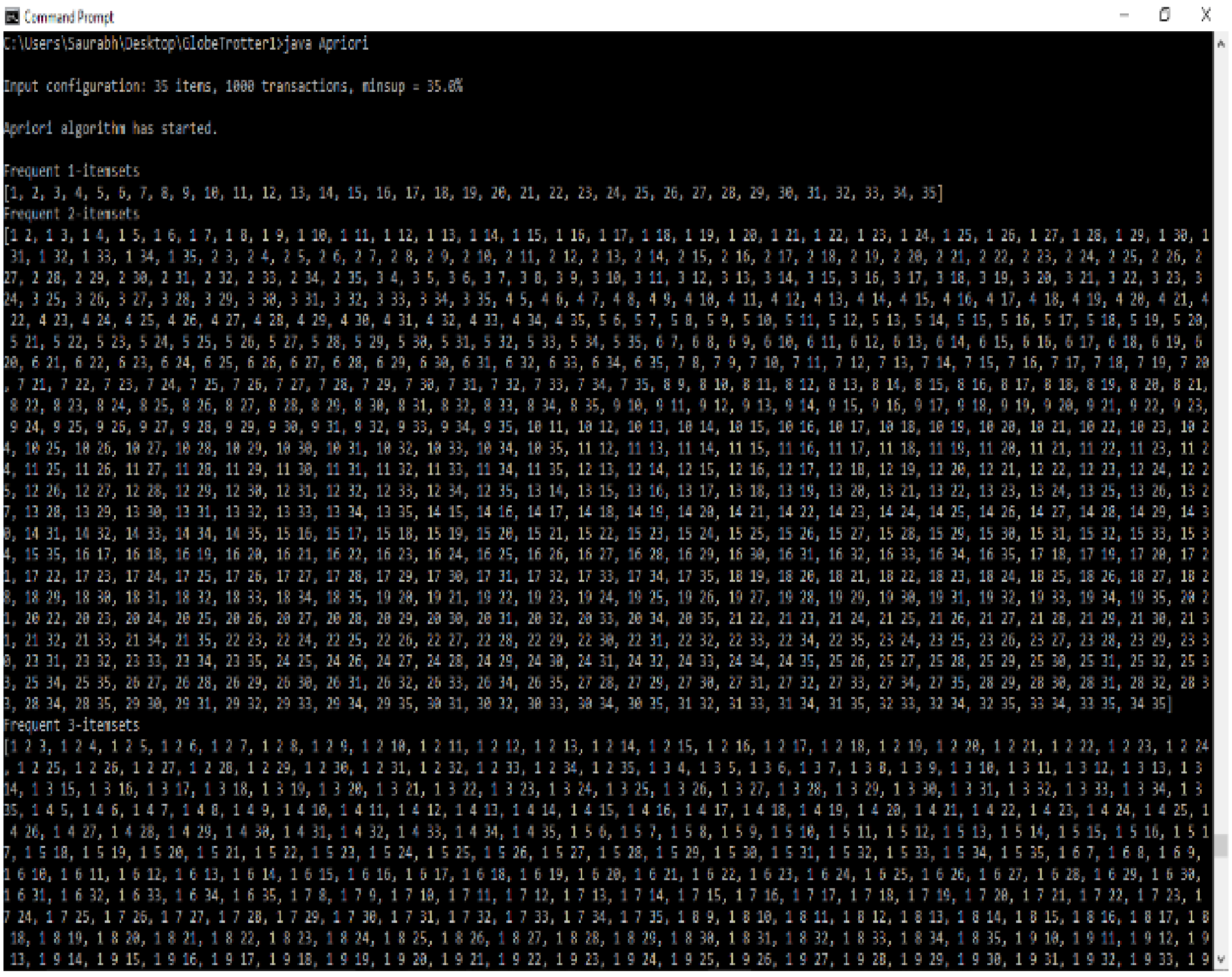
- Output

  Probability calculation

  ```
  1000// No of users behaviour.
  35// No. of point of interest In Mumbai.
  1.Gateway of India,0.518
  2.Elephanta Caves,0.497
  3.Colaba Causeway,0.501
  4.Juhu Beach,0.49
  5.Victoria Terminus,0.487
  6.Film City,0.521
  7.Haji Ali,0.531
  8.Banganga Tank,0.519
  9.Dhobi Ghat,0.494
  10.Dharavi Slum,0.502
  11.Marine Drive,0.507
  12.Prince of Wales Museum,0.512
  13.Siddhivinayak Temple,0.507
  14.Essel World,0.513
  15.Chor Bazaar,0.485
  16.SGNP,0.499
  17.Kanheri Caves,0.498
  18.Mahalakshmi Temple,0.493
  19.Mount Mary Church,0.487
  20.Rajabai Clock Tower,0.476
  21.Kamla Nehru Park,0.497
  22.Veermata Jijabai Udyan,0.51
  23.Dr. Bhau Daji Lad Museum,0.503
  24.Aksa Beach,0.494
  25.St. Thomas Cathedral,0.49
  26.Crawford Market,0.469
  27.Powai Lake,0.508
  28.Jehangir Gallery,0.47
  29.St. George Fort,0.511
  30.Khotachiwadi Village,0.504
  31.Worli Seaface,0.495
  32.Global Vipassana Pagoda,0.481
  33.Nehru Science Centre,0.497
  34.Taraporewala Aquarium,0.518
  35.Walk of Stars,0.503
  ```

Probability As Points of Interest Increments:
Gateway of India, Elephanta Caves,0.262
Gateway of India, Juhu Beach,0.272
Gateway of India, Victoria Terminus,0.264
Gateway of India, Film City,0.276
Gateway of India, Haji Ali,0.271
Gateway of India, Banganga Tank,0.265
Gateway of India, Dhobi Ghat,0.255
Gateway of India, Dharavi Slum,0.249
Gateway of India, Marine Drive,0.266
Gateway of India, Prince of Wales Museum,0.257
and so on

Screenshots



```
C:\Users\Saurabh\Desktop\GlobeTrotter1>java Apriori

Input configuration: 35 items, 1000 transactions, minsup = 35.0%

Apriori algorithm has started.

Frequent 1-itemsets
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35]
Frequent 2-itemsets
[1 2, 1 3, 1 4, 1 5, 1 6, 1 7, 1 8, 1 9, 1 10, 1 11, 1 12, 1 13, 1 14, 1 15, 1 16, 1 17, 1 18, 1 19, 1 20, 1 21, 1 22, 1 23, 1 24, 1 25, 1 26, 1 27, 1 28, 1 29, 1 30, 1
 31, 1 32, 1 33, 1 34, 1 35, 2 3, 2 4, 2 5, 2 6, 2 7, 2 8, 2 9, 2 10, 2 11, 2 12, 2 13, 2 14, 2 15, 2 16, 2 17, 2 18, 2 19, 2 20, 2 21, 2 22, 2 23, 2 24, 2 25, 2 26, 2
27, 2 28, 2 29, 2 30, 2 31, 2 32, 2 33, 2 34, 2 35, 3 4, 3 5, 3 6, 3 7, 3 8, 3 9, 3 10, 3 11, 3 12, 3 13, 3 14, 3 15, 3 16, 3 17, 3 18, 3 19, 3 20, 3 21, 3 22, 3 23, 3
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Figure 3.2: Results of implementation (I)
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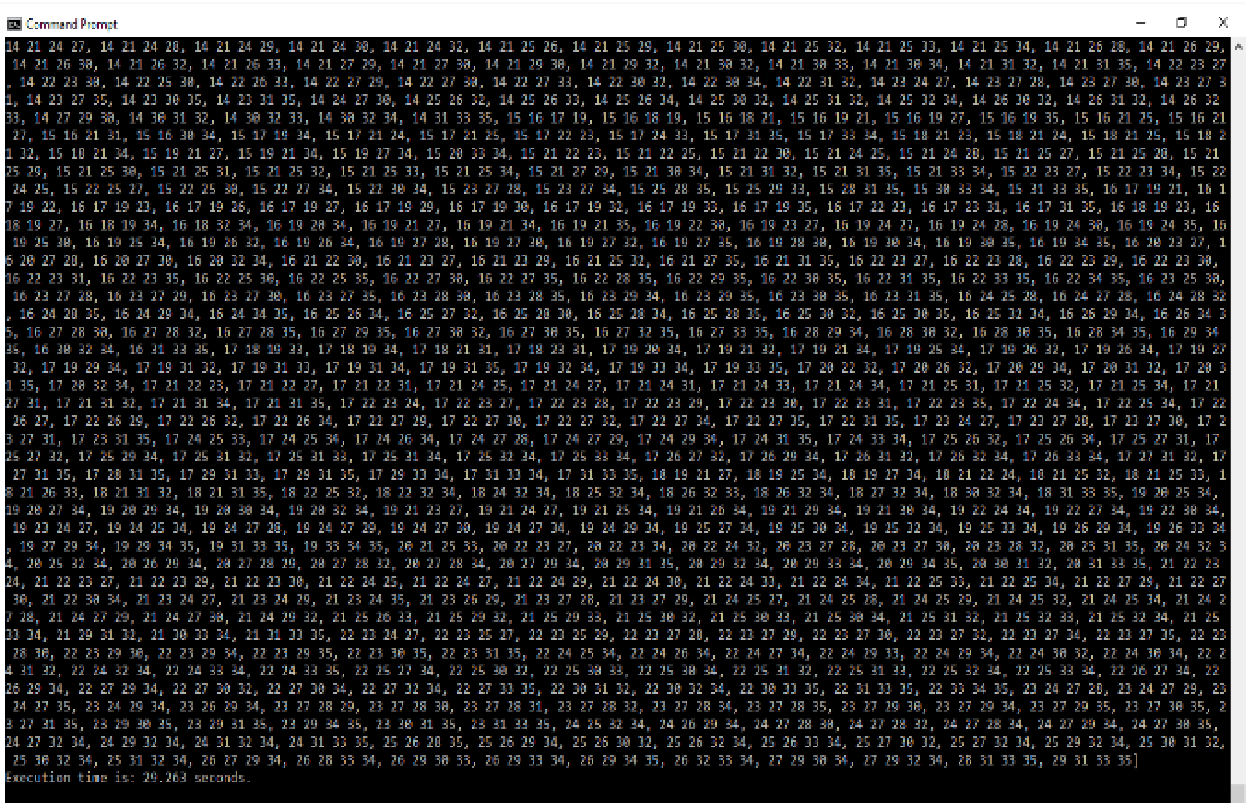

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Execution time is: 29.263 seconds.
```

Figure 3.3: Results of implementation (II)

.

- We have considered dataset with 1000 tuples with 35 different places of Mumbai.
- Dataset is provided as input to the java file.
- Apriori algorithm starts with selecting all unique places i.e 35 places from our dataset and then assigns them a probability based on the number of people that visited that particular place.
- In the next iteration, it will consider only those places which have greater probability than minimum support as defined and then will make combinations of two places and again find probabilities.
- Similarly, this process will continue till we get set of n such places in nth iteration.
- Set of places shown below will be formed and will be recommended to the user.

Prince of Wales Museum, SGNP, Powai Lake, Nehru Science Centre, Walk of Stars Gateway of India, Dhobi Ghat, Siddhivinayak Temple, Essel World, Mahalakshmi Temple

3.2 Technologies Used

- **Java**
  Java is a general-purpose computer programming language that is concurrent, class-based, object-oriented, and specifically designed to have as few implementation dependencies as possible. It is intended to let application developers ”write once, run anywhere” (WORA),meaning that compiled Java code can run on all platforms that support Java without the need for recompilation. Java applications are typically compiled to bytecode that can run on any Java virtual machine (JVM) regardless of computer architecture. Version Used: Java $1.8.0_131$

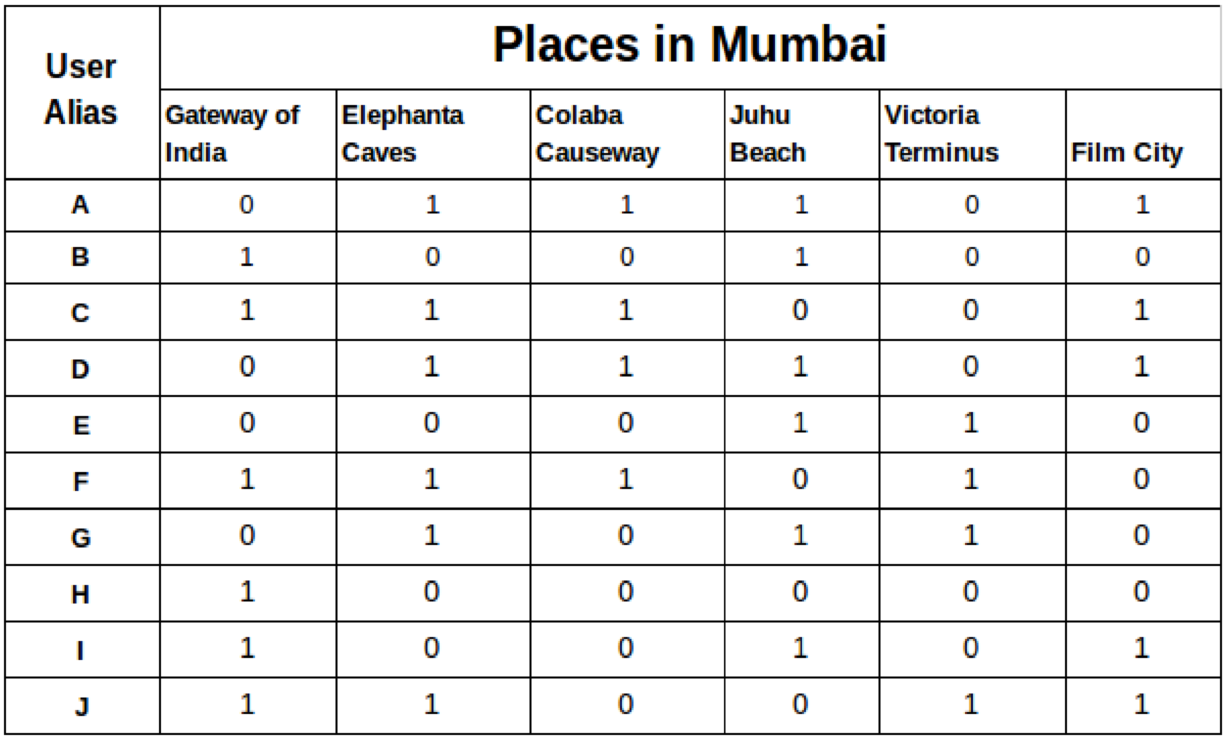
- **Eclipse**
  Eclipse is an integrated development environment (IDE). It contains a base workspace and an extensible plug-in system for customizing the environment. Eclipse is written mostly in Java and its primary use is for developing Java applications. Version Used: Neon.

3.3 Dataset

Dataset (1000 tuples) with 35 places

- Execution time was 590.262 seconds
- Frequent 5 itemsets i.e 5 places in each set based on the popularity were generated
- Such 137 sets were obtained

The 1 and 0s denote whether the user visited the popular place or did not visit.
Therefore,
1=Visited
0=Not Visited
The dataset is self-created by researching the user behaviour from the comments section of the tripadvisor page of each 35 places.



User Alias	Places in Mumbai					
	Gateway of India	Elephanta Caves	Colaba Causeway	Juhu Beach	Victoria Terminus	Film City
A	0	1	1	1	0	1
B	1	0	0	1	0	0
C	1	1	1	0	0	1
D	0	1	1	1	0	1
E	0	0	0	1	1	0
F	1	1	1	0	1	0
G	0	1	0	1	1	0
H	1	0	0	0	0	0
I	1	0	0	1	0	1
J	1	1	0	0	1	1

Figure 3.4: Mumbai Dataset Snippet

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3.4 Goal Justification

1. The goal of this module is to find set of places considering the popularity of those places within the specified location provided manually or through GPS.

2. This goal would be achieved using Apriori algorithm wherein the location would be taken as input and dataset of that location would be fetched and then Apriori algorithm would be applied where the places would be assigned a probability which is calculated by (No of users visited place X)/(Total number of users).In the second iteration combination of two such places would be made and assigned respective probabilities and it would be continued until we get set of places above our support count and finally those sets would be recommended to the user.

Chapter 4

References

4.1 Books

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[2] Optimization: Algorithms and Applications by Rajesh Kumar Arora.

4.2 Journal Paper

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4.3 Website

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