Style Guidelines for Final Year Project ReportsRecommendation System

Final Year Project Proposal

Session 2021-2022A 4th Year Student

A project submitted in partial fulfilment of the

COMSATS University Degree

Of

BSc. (Hons.)BS in Computer Science / Software Engineering (CUI)



Department of Computer Science

COMSATS University Islamabad, Lahore Campus

26 February 2021

**Project Registration**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Project ID (for office use) | | |  | | | | |
| Type (Nature of project) | | | [✓] **D**evelopment [ ] **R**esearch [ ] **R**&**D** | | | | |
| Area of specialization | | | Mobile App Development, Web App Development, Machine Learning, Natural Language Processing, Reinforcement Learning | | | | |
| **Project Group Members** | | | | | | | |
| Sr.# | Reg. # | Student Name | | CGPA | Email ID | Phone # | Signature |
| (I) | Group Leader  SP18-BCS-159 | Ibad Ahmad | | 3.06 | SP18-BCS-159@CUILAHORE.EDU.PK | 0303-2172369 |  |
| (ii) | SP18-BCS-047 | Hasseb Yaseen | | 3.27 | SP18-BCS-047@CUILAHORE.EDU.PK | 0321-8436878 |  |
| (iii) | SP18-BCS-007 | Wahaj Hafeez | | 2.7 | SP18-BCS-007@CUILAHORE.EDU.PK | 0341-2386058 |  |
| Name & Signature of Batch Advisor  (If students are eligible for FYP) | | | | Sir Shuja Akbar | | | |

# Plagiarism Free Certificate

This is to certify that, I am Ibad Ahmad S/D/o Naseem Anwar, group leader of FYP under registration no CIIT/SP18-BCS-159/LHR at Computer Science Department, COMSATS Institute of Information Technology, Lahore. I declare that my FYP proposal is checked by my supervisor and the similarity index is 1% that is less than 20%, an acceptable limit by HEC. Report is attached herewith as Appendix A.

**Date:** 25-2-2021 **Name of Group Leader:** Ibad Ahmad **Signature:** \_\_\_\_\_\_\_\_\_\_\_\_\_

**Name of Supervisor:** Kanza Hamid **Co-Supervisor (if any)**: Maam Zeenat

**Designation:** Lecturer **Designation:**

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Approval of FYP Management Committee**

Committee Member 1: Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[ ] Accept [ ] \*Defer [ ] \*Reject Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*Remarks: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Committee Member 2: Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[ ] Accept [ ] \*Defer [ ] \*Reject Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*Remarks: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Convener: Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[ ] Accept [ ] \*Defer [ ] \*Reject Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*Remarks: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Abstract**

Our project is a generic recommendation system, which will be varying and adopting in the environment with the passage of time. In this project, our aim is to provide an online recommendation system service, which people can use to make their experience a lot better on contrary to their experience with some other service like Google. To find a correct, low budget orientated and location friendly service is very important and required for users but it’s not a cake walk today as there are plenty of sources which are not among those which can be reliable.

As of now, lot of recommendation systems are not able to suggest users an appropriate place that map their needs. Information mismatch have a great negative impact on such recommendation system predictions. To make a customised recommended application for imparting beneficial and powerful on line services, we want mass reviews and updated data from online databases.

**Table of Content**

|  |  |  |
| --- | --- | --- |
| Index | Topic | Page Number |
| 1 | Introduction | 05 |
| 2 | Motivation & Scope | 07 |
| 3 | Related Work | 08 |
| 4 | System Architecture | 09 |
| 5 | Goals and Objectives | 09 |
| 6 | Individual Tasks | 10 |
| 7 | Gantt chart | 11 |
| 8 | Future Work | 12 |
| 9 | Tools & Technologies | 12 – 13 |
| 10 | References | 13 |

**Introduction**

In different fields, including e-commerce, social media applications, and video platforms, recommendation systems are one of the most important aspects. They help people to suggest what might be interesting, useful, and relatable for them.

Models are built to recommend the content which is appropriate according to user requirement or pattern by depending on different factors like user information, interest of user, targeted age, reviews and ratings. This helps to keep user engage with the application and it becomes easy to suggest something to users according to his/her needs by using provided data.

Starting with the basic idea, Recommendation system is sort of data filtering method, in which on the basis of certain parameters you show certain data to user from database. The parameters can be rating, prices/rates, accessing comfort, nearby one etc. In simple words, Recommendation systems provides only that information which will be user hoping against the content he has provided to system.

Now our goal is to create a recommendation system which will suggest its users about multiple things like hospitals, restaurants, hotels etc. depending on the different parameters like ratings, remarks/feedback and the list goes on. On the other hand, system must be able to be adaptive with new parameter’s value which can help the system to remain up to date with the future recommendations.

Now if we talk about the basic parameters, these are as following

* Rating
* Reviews
* Distance
* Price

**Motivation and Scope**

Since we are living in the 3rd world country and are among a developing one’s in Asia. We don’t have recourses that can cover up the mass requirements. There are hundreds of thousands of cases weekly that are unable to get even first aid timely, especially those who are lying in or near to rural areas. Pakistan’s population, which belongs to this section reported to be 63.09% in 2019, which is a shocking stat itself.

One of the many examples we can remember from time is of Muniba Mazari. The idea to cite the previous example is that, there are several cases of these contexts where the population is unable to find the emergency service just because of the unawareness and no helping hands that can lead them to desired output. Our aim is same, to provide that sort of application, which will be able to guide with best possible source of help, that user can imagine or desire at runtime.

This application will cover most of the modules that we counter in normal day ranging from

* Hotels
* Libraries
* Restaurants
* Hospitals

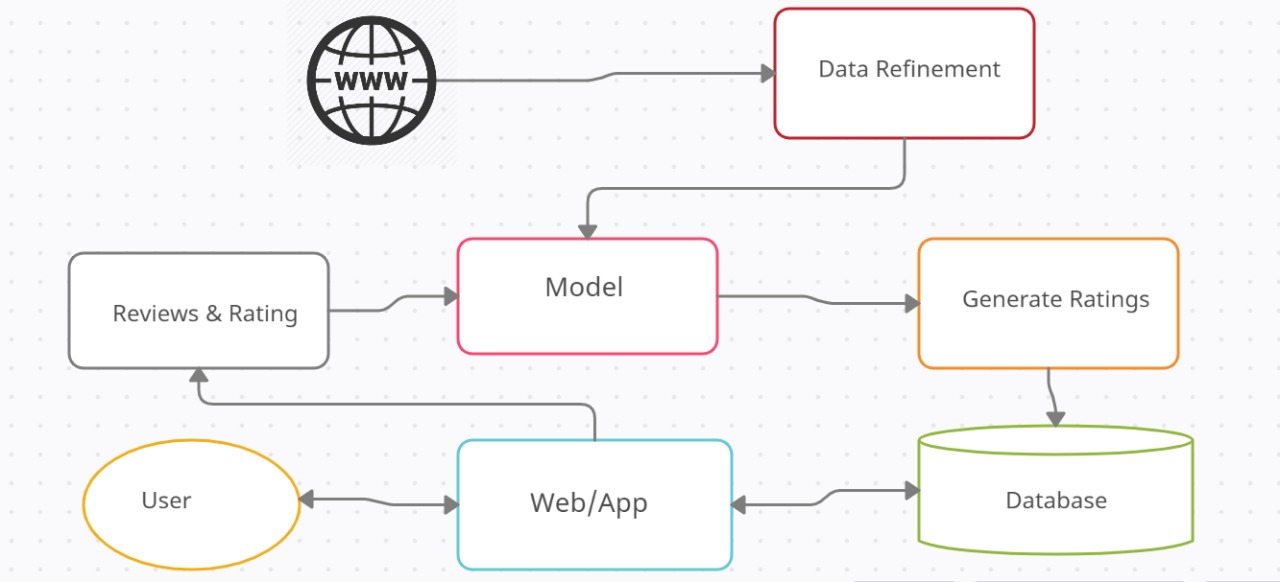
Furthermore, user can apply filters as per their use. In future, more modules can be added to this system as user requirements increase and so do filters. Here are the modules that can be added as an extension of this project.

* Shopping Centers
* Petrol Pumps
* Mechanics

**Related Work**

* If we go back to somewhere in 2006’s mid of October, Netflix invited the data scientists around the world to an event named as ‘Netflix Prize’ to create a better recommendation system as compared to the one they are been using now in exchange of prize money [1].
* There is an article on "Analytics Steps" named "What Are Recommendation Systems in Machine Learning?” [2] This article helps to understand the types of Recommendation systems in the market. On the other hand, according to some articles like 1 on "Medium.com" named "Introduction to recommender systems,"[3] there are 2 major approaches i.e. Collaborative & Content base, and explained in detail in that article. Collaborative is the one under which our project lies. If we talk about the related work, which falls under the category of the Collaborative Filtering type, there are many like Food Panda to recommend good food nearby, similarly booking.com recommend best hotels to its user according to budget, ratings, etc. Each of that platform is single task specific recommender but our goal is to develop single platform for all such type of recommendations.
* Our Supervisor Ms. Kanza Hamid has already supervised a similar type of project named ‘Doctor in Hand’ which was a static application that recommends best doctors in town along the appointment booking section for the user.

**System Architecture**

****

**Goals and Objectives**

* To make it simple and viable for clients to get good suggestions closest to their area as well as according to their need.
* To develop application, which will automate the process of finding the recommendation according to requirement of user.
* To build that sort of application that contains both accuracy and efficiency. It’ll help its visitors to filter the affordable, authentic and nearest services, whom which they can trust or prefer.
* To create a model, that will vary time to time in order to acquire excellence in further recommendations.

**Individual Tasks**

|  |  |  |  |
| --- | --- | --- | --- |
| **Task Description** | **Group Members** | | |
| Ibad Ahmad | Haseeb Yaseen | Wahaj Hafeez |
| **Data Collection** | ✓ | ✓ |  |
| **Data Pre-processing** | ✓ | ✓ | ✓ |
| **Data Visualization** | ✓ |  | ✓ |
| **Applying NLP** | ✓ | ✓ | ✓ |
| **Database Modelling** |  | ✓ | ✓ |
| **Machine Learning Algorithms** |  | ✓ | ✓ |
| **Reinforcement Learning** | ✓ | ✓ | ✓ |
| **Native App Development** | ✓ | ✓ |  |
| **Desktop App Development** | ✓ |  | ✓ |
| **Report Writing** | ✓ | ✓ | ✓ |

**Gantt chart**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Task Description** | **Months** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **FEB** | | | | **MAR** | | | | **APR** | | | | **MAY** | | | | **JUN** | | | | **JUL** | | | | **AUG** | | | | **SEP** | | | | **OCT** | | | | **NOV** | | | |
| Information Gathering |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Data Scrapping |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Data Analysis & Refinement |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Database Development |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Model’s selection |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Apply NLP, ML Techniques |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Testing Phase |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Web Development(Front End) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| App Development(Front End) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Web Development(Back End) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| App Development(Back End) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| System Testing |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Report Writing |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Future Work**

Some of the future goals are mentioned below which will help to make recommendation applications more user-friendly, robust and flexible while keeping the quality mantained .

* Integrate more modules over the time according to their need.
* We will create the module using which one will make online bookings; this will save the time of the user as well as will help the service providers to interact with our app in a better way.
* Make blog within application where ranked publish their experience and reviews to aware the people about the latest insights

**Tools and Technologies**

* **Python**

It will be used for training, training phase of the model, and for data scrapping using its libraries like Tensorflow, Keras, Pandas, Numpy, beautifulSoup, Sciekit-Learn etc.

* **Google Colab or Kaggle Kernels**

It provides a GPU support for models training and testing freely. Will be a massive asset since the second and third model require the Deep Learning which takes hours and days depends upon the problem statement on CPU’S. So the GPU support is mandatory

* **JavaScript**

JavaScript, also known as JS, is high level multi paradigm language. It is the only language as of now that covers both frontend and backend orientated services in him without the collaboration from any other language. Currently in race with Python to become the most famous programming language of the world.

* **React JS**

It is used for client side rendering in desktop applications. Follow component based approach to create a single page App.

* **Node JS**

Allows you to send asynchronous API calls to the server. Mostly integrated with any other JS frontend libraries or frameworks.

* **Express JS**

Express js is an open source framework of node js. It is more of a wrapper around the node js which provides extra functionality in easy and precise way.

* **MongoDB**

No SQL type Database which provides you the functionality to store your content independent of any programming language.

* **React Native**

It is an open source native app framework created by Facebook. Follow same component based approach as React js. Only difference is it for mobile apps while React js is for Desktop applications.

**References**

**[1].** Netflix Prize

<https://www.thrillist.com/entertainment/nation/the-netflix-prize>

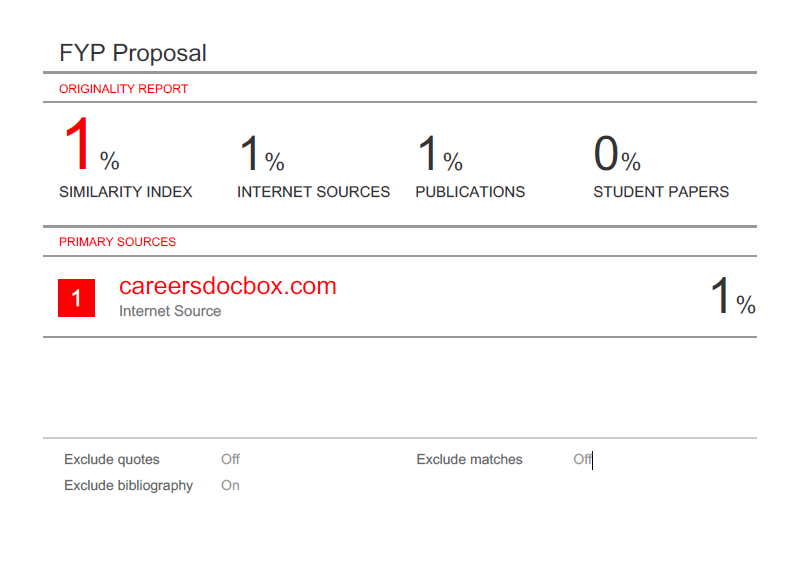
**[2].** What Are Recommendation Systems in Machine Learning?

<https://www.analyticssteps.com/blogs/what-are-recommendation-systems-machine-learning>

**[3].** Introduction to recommender systems

<https://towardsdatascience.com/introduction-to-recommender-systems-6c66cf15ada>

Appendix A

**