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CHAPTER 1: INTRODUCTION

1.1 Topic of the System

Title : - "Medical Infrastructure Management by Scheduling Visits and Online Access"

1.2 Project Abstract

System "**Medical Infrastructure Management by Scheduling Visits and Online Access**" is a Machine Learning project which is basically used for taking inputs from user and provide a good results about their health. It is an interface that helps in providing appointment with specialist Doctor . it is an interface which is designed to give benefits to patients and users in a fast way as soon as possible.

1.3 Purpose of System

The purpose of this project to provide admin has to collect the patients medical history of records and filter it appropriately by applying data preprocessing techniques. Once the data comes into the structured shape it can then be fed into the relational database structure of MS Excel file. The admin also needs to monitor the predictions and replies of the model to ascertain quality.

1.4 Target User

Admin's functionalities are to Collecting the appropriate medical records of the patients, handle missing values, handling categorical values,Creating sparse matrix representation, Feeding data to the autonomous pipeline for predictions, selecting and training an appropriate machine learning algorithm.

VISITOR can perform the basic task of visitor is to access the chat bot from the front end and reply to its queries with a binary response (Yes/No). The visitor will be shown a confidence interval related to a certain prognosis which needs to be further investigated and experimented with for better results. The visitor can also contribute with the help of the admin to add new symptoms and diagnosis records to the database of medical history.

1.5 Project Background

We know that the internet plays an important role in everyone's life and everything in this world is developing as per the technology development. At the outset of present day period, Computers played a major role in computing and as the technology expands everything has changed and the computers became workstation computers, super computers and so on. Later developed the mobile technology and now mobility got to be everything. Everything made simple using mobility.

From past 2 decades, the utilization of mobile devices has been increased, which has led to easiness of carrying out everyday activity. In addition with the advancement of wireless technologies, wireless networks have taken over the entire world. In todays world the business, transactions can be done easily as well as securely from any place and at any point of time. The Internet connections can be made with any devices anywhere inside the world and can share necessary information among them.

Patient waits have been a topic of concern in health care system. Waits occur throughout the procedure of care and are built into and budgeted for within nowdays operations. The status quo is changing, however, as patient experience becomes linked to provider payment, efficiency and service become differentiators between hospitals and providers, and patient expectations evolve. While excellent clinical care remains the expectation, health care consumers are now seeking health care and supporting systems that are respectful of individuals. We describe the important forces shaping wait times throughout health care, the evolving use of techniques and tools from other industries to improve health care access, and the move toward a person-centered model of care. Through our personal experiences leading our respective health care organizations, we have tackled these complex issues, and we present in this paper the lessons we have learned along the way. We acknowledge that improaving access and scheduling requires systems-level transformation and that such transformation can uncover previously unrecognized resources and improve all aspects of care delivery.

1.6 Problem Context

The impact of long patient wait times on health outcomes is not taken into concern, and the sparse study of the issue does not make any conclusions, except for those individuals with acute conditions, where difficulties with access and lengthy wait times are associated with negative outcomes. Long waiting queues represent a burden on patients as well as on their families, as reflected by poor quality of medical care and the adverse experience of obtaining and receiving care. Although not reflecting health outcomes directly, patients with not any urgent needs who experience long wait times have been shown to have a higher rate of noncompliance.

1.7 What is the rationale behind the System: Why do we need this System?

The problems that are traced needs to be considered and the researcher has decided to construct such an application that would focus on providing solutions for the above-mentioned problems.

1.7.1 What are the benefits of the System: What are the potential benefits derived?

Computer system can benefits in various fields such as costs, timeliness and accuracy of patient treatment, increased service capacity, reduce personnel costs and levels of inventory, and improve the quality of patient care. However, experience shows that most of these benefits will not occur automatic by following system implementations. Operational threats may occur that may diminish information accessibility, timeliness, and accurateness; procedures may not have been sufficient reduced to translate the realities of the system; and personel tasks may not have been adequately restructured. In order to realize the full potential of information systems, health care organizations must plan for and implement strategies that are designed to maximize such benefits. This project describes the method of giving beneficial strategies to the patients. The processes used to define strategies and their results are presented.

1.8 System Objectives

1.8.1 What are the project objectives?

The analytic frameworks for assessment have guided for measure development initiative in the public as well as private sectors. One of the most effective is the framework put forth by Institute of Medicine (IOM), which includes the following five aims for the health care system.

- Safety: Avoiding harm to patients from the care that is intended to help them.
- Effectiveness: Providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to profit (avoiding underuse and misuse, respectively).
- Patient-centered technique: Providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.
- Time Benefits: Reducing waits and sometimes harmful delays for both those who receive and those who give care.
- Efficiency : Avoiding waste, including waste of equipment, supplies and energy.

Existing measures address some domains more extensively than others. The vast majority of measures address effectiveness and safety, a smaller number examine timeliness and patient-centeredness, and very few assess the efficiency or equity of care.

1.8.2 Learning Objectives

Frameworks like the IOM domains also make it easier for consumers to grasp the meaning and relevance of quality measures. Studies have shown that providing consumers with a framework for understanding quality helps them value a broader range of quality indicators. For example, when consumers are given a brief, understandable explanation of safe, effective, and patient-centered care, they view all three categories as important. Further, when measures are grouped into user-friendly versions of those three IOM domains, consumers can see the meaning of the measures more clearly and understand how they relate to their own concerns about their care.

1.9 Scope of the System

Health services research is the multidisciplinary field of scientific investigation that studies how social factors, financing systems, organizational structures and processes, health technologies, and personal behaviors affect access to health care, the quality and cost of health care, and ultimately our health.

Mainly this system focus on security and services to the layman so that they can fetch their details whenever they require it is one of the main motto of this system.

1.10 Conclusion

This Chapter concludes the study for the system. Studying the system for the purpose of the system and goals/ objectives of the system. After the purpose of the system is determind, the developer then developed with the benefits of the system to its intended end-user and how the system can benefit its users. This part has also included the deliverables the system will produce after it is completed. The drawbacks for the system have also been determined the limits of the scope of the health care domain system.

CHAPTER 2: PROBLEM DESCRIPTION

2.1 Feasibility Study

An initial investigation culminates in a proposal that determines whether an alternative system is feasible. It is always necessary to carry out the feasibility study for the development of new project system. The most successful system projects are not necessarily the biggest one rather that truly fulfils user expectations. If the feasibility study is to serve as a decision element, it must answer the following questions:-

- Is there any new and better way to do the job that solves the purpose?
- What are the costs and savings of the alternatives?
- Are there any legal restrictions imposed by the government or any other regulatory body?
- Is the proposed solution economically feasible?
- Does there exists any bottleneck that may turn the process of development futile exercise?
- What is recommended?

I, thereby keeping in mind the above mentioned guidelines carried out a brief study for the project. This study can be categorized under as:

- Technical feasibility
- Economical feasibility
- Legal feasibility
- Operational feasibility
- Behavioral feasibility

2.1.1 Technical Feasibility

Technical feasibility is conducted to verify whether the project is feasible to be developed within the available resources or not. The technical feasible takes into account the technical requirements for the project, the technical resources required by the project for its successful and efficient completion. The specific technical resources to be available for completing the project successfully are given below:

Hardware Resources

S. No.	Hardware Resources
1.	Processor- Core i5 and later version
2.	RAM - 8GB and more
3.	Pen Drive, Mouse, Printer, Keyboard
4.	System Type- 64-bit OS
5.	Hard Drive– More than 100 GB
6.	Accessories – Internet connection.
7.	Windows USB driver for Windows: To connect an Android-powered device with the development environment over USB for USB Debugging.

Table 2.1: Hardware Resources

Software Resources

S. No.	Software Resources
1.	Spyder , Decision tree
2.	Plug-In –Python 3
3.	Database–MySQL
4.	OS- Windows 7 or later
5.	Case Tools - Microsoft Project, Microsoft Visio and Star UML
6.	Documentation and Presentation tool - Microsoft Office 2010

Table 2.2: Software Resources

2.1.2 Economical feasibility

Economic feasibility is most frequently used for providing the effectiveness of the system. The most commonly known as cost/benefit analysis, the procedure is to determine the benefits and savings that are expected from the proposed and compare them with the cost incurred in the current/existing scenario. Before the development of my system:

- Inefficient use of the internet resource was done. No proper schedules were implemented so as provide the internet resource at specified timings. Most of the students were found to be accessing internet during there language practical timings. This has been overcome by implementing user group management. This has lead to an efficient use of the resource.

2.1.3 Legal feasibility

The development of proposed system is legally feasible because there are no governments or organizational restrictions imposed on it. The software's that will be used to make the project are open-source and free to use. Hence, the project is legally feasible.

2.1.4 What is Operational feasibility?

Once it is determined that system is both technically and economically feasible then it has to be seen if it is operationally feasible. Operational feasibility refers to projecting whether the system will operate and be used once it is installed.

The proposed system is operationally feasible, as there no need for the faculty to keep a check on use of internet at the time of language practical's. There no need to keep a manual eye on the behavior of client on the internet. Site blocking, service blocking (FTP/HTTP) and content filtering features of proposed system cater to this very task.We have designed front end by getting the information from the end user, which help us in designing the GUI according to the end user’s requirements. The end users can easily understand and expand it in the future.

As the faculty members expressed the need for an improved system, they put in all efforts to see that it becomes feasible.

2.1.5 What is behavioural feasibility?

People are inherently resistant to change, and computers have been known to facilitate change. An estimate should be made of how strong a reaction the user staff is likely to have toward the development of a computerized system. It is common knowledge that computer installation has something to do with turnover, transfers, retraining, and the charges in employee job status. Therefore, it is understandable that the introduction of a candidate system requires special efforts to educate, sell, and train the staff on new ways of conducting business.

2.2 Conclusion

Chapter 2 is all about the problems identified in the current area of study i.e. the problems in ticket environment. The developer has identified all the problems which is generally facing by the general user. The problems have been documented along with the justification for each problem. After all the problems are identified, the developer’s next task was to provide appropriate solutions to resolve the problems. For the same purpose, the solution corresponding to each problem has been documented along with the justification. A feasibility study is then conducted for the system to ensure that the proposed system is technically, operationally, economically feasible and can be completed within a specified time frame. The feasibility study is successful, creating a further path for the developer to move ahead with the project.

The project is technically feasible since the hardware, software and the resources needed for executing the system are ready. After evaluating the cost and benefits incurred on and derived from the system, it is concluded that the project is economically feasible. The project will be completed on time and deadlines will be followed as scheduled in the Gantt chart. The system will be socially acceptable and will satisfy the needs of users.

CHAPTER 3: LITERATURE REVIEW

3.1 Introduction

A literature assessment is a description of what paintings has performed by way of different researchers related to the topic. It is conducted the usage of published books, journal and other papers and is a baseline for present research. The following are the motive of a literature evaluation:

- To perform assessment of already behavior research to discover their ideas, energy, wekness and their methodologies.
- To have a top level view of existing suggestions pertains to the difficulty, revew the findings & view of someone.
- To solution sure query & cast off issues related to the topic.

3.2 Advance Research

The idea came to the mind of developer while going through the hospital to get the receipt no with the counter after standing in long queue which is the offline mode. Developer has seen that due to this long queue or we can say that due to less counter some of the people who are in hurry because their parents or relatives, children are in serious disease thy need to stand in the long queue and the less counter and due to this it is directly effect to the speed of handling patients. Then the developer has crack the idea in his mind why not we do this in online mode, as we know that there is availabilty of chatbot system in machine learning and in artificial intelligence abut developer think that why it is not possible that we can book the online appointment in online to solve these problem which are faced by the general person and it is also directly beneficial to the revenue of the hospital also get more no of patients ,no problem to stand in queue and it’s also save the time of the people.

As we also know that we are in that era where android mobile is the common for every user. If we take the hundred people 95% of the people having own smartphone in his hand so why not, we develop in the system using machine learning . There are a lot of application like

Forksy,Sensely which show the list of the doctor for specific disease, fees of every doctor. In the last year april 2018 has launched the one application which is afedrugBot which I want to develop but the main drawback of that system is it just book the appointment for only some select cities like Delhi, Mumbai, Calcutta etc. but some who wants to appointment and suggestion in the general cities like Panipat, sonipat etc. it have less no of hospitals this app is useless so for that these users have to go in offline mode i.e. counter based . So, developer wants to develop the application like irctc but only for the general as well as for the platform ticket and stored the user information at the time of registration in the database for the security purpose and also developer want to gives the facility to the user to the balance through his e-wallet which is time saving process more in compare to online transaction some time it being with friend or family transaction process is lost. Also, developer wants to give the receipt to the users in the form of QR code which is more better way in compare to printed receipt. It that QR code is has scan at the hospital counters . where the user information is stored in data and it also show that the receipt is valid or not. These all the thing which developer think that it is totally new because none of the system exists in now days so in future it may be possible that it is directly useful and implemented by the machine learning.

3.3 Academic Research

Before developeng the system, the developer conduct academic studies via studying research papers, journals and so on. To recognize the actual want Medical Infrastructure Management by Scheduling Visits and Online Access software for the overall users. It will even help the developer to refine the functioncalities to be covered inside the machine. The integration of Internet-of-Things and pervasive computing in clinical gadgets have made the present day healthcaresystem ”smart.” Today, the function of the healthcare machine isnot restricted to deal with the patients handiest. With the help of implantablemedical gadgets and wearables, Smart Healthcare System (SHS)can constantly monitor specific essential symptoms of a patient andautomatically come across and save you crucial clinical conditions.However, those increasing functionalities of SHS raise severalsecurity worries and attackers can exploit the SHS in numerousways: they can hinder everyday function of the SHS, inject falsedata to change critical symptoms, and tamper a medical tool tochange the final results of a medical emergency. In this paper, wepropose HealthGuard, a machine learning-based securityframework to discover malicious in a SHS.

3.3.1 URL technology

Since URL is one of the demanding situations of the proposed gadget, the developer has long past thorough the numerous regions like websites and it's assembly in the system. A Uniform Resource Locator (URL), colloquially termed a web address, is a connection with a web aid that specifies its vicinity on a laptop network and a mechanism for retrieving it. A URL is a specific type of Uniform Resource Identifier (URI),although many human beings use the 2 terms interchangeably. URLs arise maximum usually to reference web pages (http), however are also used for record switch (ftp), electronic mail (mailto), database get admission to (JDBC), and plenty of different applications.

3.3.2 Software Methodology and Software Engineering Concepts

In order to deliver a consumer glad gadget inside time, the developer has to investigate for the methodology which great fits the app. Most discussions of builders using device studying revolve round growing AI-powered packages and the tools used to create them: TensorFlow, PyTorch, Scikit-study, and so forth.But there may be another manner device studying is impacting software improvement: with the aid of manner of recent improvement tools that use system studying strategies to make programming less difficult and greater productive. Here are five projects—3 business, two experimental—that put machine getting to know to work for developers in the improvement procedure.

3.3.3 Human Computer Interaction Principles

To reap dependable, usable, and nicely-engineered interactive devices in healthcare calls for applied Human Computer Interaction (HCI) research and cognizance of HCI issues throughout the lifecycle, from design through to procurement, schooling and use. This paper indicates that a few healthcare gadgets fall a ways quick, and thus identifies an opening in implemented HCI. We use a simple, interactive health center mattress as a case look at, arguably so habitual and simple sufficient that there need to had been very few problems. However, the bed's interactive manipulate panel design violates fashionable HCI standards. It is also badly programmed by way of the manufacturer. Evidently, some thing has long past wrong, somewhere from design to procurement, and we argue most of the problems would have been controlled or averted by traditional HCI techniques. Driven by using the case observe, this paper explores the troubles and makes suggestions. There are many in addition poorly designed scientific devices. Manufacturers and healthcare purchasing corporations should adhere to HCI processes and suggestions, as well as the ones furnished via regulatory corporations for the layout, regulation, and procurement of devices, merchandise, or systems that make a contribution to patient safety. The challenge is to make HCI expertise and priorities to be had to and effective on this crucial domain in any places which could make a difference. Eye-monitoring, cognizance equipment, gadget getting to know, coordination, knowledge.

3.3.4 Project Management Principles

Project management strategies could be aforethought for the gadget like scheduling, feasibility, chance evaluation to complete the improvement smoothly.

Requirement Analysis is a software program engineering task that bridges the gap between system degree software allocation and software program layout. It offers the device engineer to specify software program feature and overall performance imply software’s interface with the other machine elements and set up constraints that software program should meet.

The simple intention of this stage is to acquire a clear photo of the needs and necessities of the stop-user and also the enterprise. Analysis entails interaction among the clients and the evaluation. Usually analysts studies a hassle from any questions requested and reading present files. The analysts must find the actual desires of the consumer despite the fact that they don’t recognise them without a doubt. During evaluation it is important that a entire and constant set of specifications emerge for the device. Here it is critical to resolve the contradictions that would emerge from facts were given from various events.

3.4 Domain Research

Domain research is necessary because the project area varies in numerous cases and once this is finished for a selected module, then we can work on evaluation and designing of that particular module offers ease of its use. During the degrees of studies, the researcher acknowledged that there are sufficient problems confronted with the aid of the person in environment of medical infrastucutre.

3.4.1 Machine learning

Machine learning is an application of synthetic intelligence (AI) that provides structures the capacity to mechanically analyze and improve from enjoy without being explicitly programmed. Machine gaining knowledge of focuses on the improvement of laptop applications that could get admission to facts and use it research for themselves.

The method of learning begins with observations or statistics, which includes examples, direct enjoy, or preparation, with a view to look for patterns in statistics and make better selections within the destiny primarily based at the examples that we offer. The primary goal is to permit the computer systems study mechanically with out human intervention or assistance and regulate moves therefore.

Some device studying methods

Machine mastering algorithms are regularly classified as supervised or unsupervised.

Supervised device getting to know algorithms can follow what has been learned in the past to new records the use of categorised examples to are expecting destiny activities. Starting from the analysis of a regarded schooling dataset, the getting to know set of rules produces an inferred characteristic to make predictions about the output values. The gadget is able to provide targets for any new input after sufficient schooling. The mastering set of rules also can compare its output with an appropriate, meant output and find errors as a way to regulate the version consequently.

In assessment, unsupervised gadget getting to know algorithms are used when the facts used to educate is neither categorized nor classified. Unsupervised gaining knowledge of research how structures can infer a function to describe a hidden shape from unlabeled statistics. The system doesn’t discern out the right output, however it explores the information and may draw inferences from datasets to describe hidden structures from unlabeled records.

Semi-supervised gadget mastering algorithms fall somewhere in between supervised and unsupervised getting to know, for the reason that they use both categorized and unlabeled facts for training – generally a small amount of labeled information and a large quantity of unlabeled facts. The systems that use this technique are able to extensively enhance learning accuracy. Usually, semi-supervised getting to know is selected while the acquired categorised records calls for professional and applicable sources for you to educate it / analyze from it. Otherwise, acquiringunlabeled records normally doesn’t require extra sources.

Reinforcement machine gaining knowledge of algorithms is a studying technique that interacts with its environment with the aid of generating actions and discovers errors or rewards. Trial and mistakes search and not on time praise are the most applicable traits of reinforcement gaining knowledge of. This approach lets in machines and software agents to routinely determine the suitable behavior within a specific context with a purpose to maximize its performance. Simple praise comments is required for the agent to research which motion is fine; this is referred to as the reinforcement sign.

Machine learning enables analysis of big portions of data. While it typically promises quicker, extra correct consequences on the way to pick out profitable possibilities or risky risks, it could additionally require time beyond regulation and assets to train it properly. Combining device gaining knowledge of with AI and cognitive technology can make it even extra powerful in processing huge volumes of records

3.4.2 Spyder

Spyder stands for Scientific Python Development EnviRonment. Spyder’s authentic writer is Pierre Raybaut, and it become formally released on October 18, 2009. Spyder is written in Python.

Some of its key functions are the following:

- It is open source.
- Its editor supports code introspection/evaluation functions, code completion, horizontal and vertical splitting, and goto definition.
- It comes with Python and IPython consoles workspace, and it supports debugging runtime, i.E., as soon as you type it's going to show the mistakes.
- It has got a documentation viewer where it suggests documentation associated with lessons or functions known as both in editor or console.
- It additionally helps variable explorer wherein you possibly can discover and edit the variables that are created for the duration of the execution of report from a photo person interface like Numpy array ones.
- It integrates NumPy, Scipy, Matplotlib, and other scientific libraries. Spyder is excellent while used as an interactive console for constructing and testing numeric and clinical packages and scripts built on libraries which includes NumPy, SciPy, and Matplotlib.

Apart from this, it's far a easy and mild-weight software program which is straightforward to install and has very exact documentation.

Libraries:- Today, Python is one of the most popular programming languages for this mission and it has changed many languages within the enterprise, one of the cause is its tremendous collection of libraries. Python libraries that used in Machine Learning are:

- Numpy
- Scipy
- Scikit-examine
- Theano
- TensorFlow
- Keras
- PyTorch
- Pandas

- Matplotlib

Today, Python is one of the most popular programming languages for this mission and it has changed many languages within the enterprise, one of the cause is its tremendous collection of libraries. Python libraries that used in Machine Learning.

TKINTER: Tkinter is the same old GUI library for Python. Python whilst combined with Tkinter provides a quick and easy manner to create GUI programs. Tkinter offers a powerful object-oriented interface to the Tk GUI toolkit.

Creating a GUI application using Tkinter is an easy project. All you need to do is carry out the following steps –

Import the Tkinter module.

Create the GUI software foremost window.

Add one or greater of the above-referred to widgets to the GUI software.

Enter the primary event loop to do so towards every event induced by means of the consumer.

Tkinter Widgets:

Widgets are some thisng like elements in the HTML. You will locate unique kinds of widgets to the one-of-a-kind varieties of elements within the Tkinter.

Let's see the short creation to all of those widgets within the Tkinter.

Button:- Button widget is used to place the buttons in the tkinter.

Canvas:- Canvas is used to attract shapes in your GUI.

Checkbutton:- Checkbutton is used to create the test buttons to your utility. You can pick multiple choice at a time.

Entry:- Entry widget is used to create input fields within the GUI.

Frame:- Frame is used as bins inside the tkinter.

Label:- Label is used to create a single line widgets like text, photographs, and many others..,

Menu:- Menu is used to create menus within the GUI.+

3.4.3 Security and Permissions

Every machine learning models runs its own process and security among which these applications are applied with the help of Linux installations. Android has a safety mechanism that restricts processes to perform various operations. Based on the permissions a process can access data from other applications or other operations. This concept will help developer to maintain the security of the application and get access to all the permissions for the application. For example, developer can specify access to the Bluetooth function of the device by the application.

3.5 Market Review

LOGIN MENU: A Login is a fixed of credentials used to authenticate a person. Most frequently, those consist of a username and password. However, a login may include other information, such as a PIN number, passcode, or passphrase. Some logins require a biometric identifier, such as a fingerprint or retina scan.

Logins are utilized by websites, laptop programs, and cell apps. They are a security degree designed to prevent unauthorized get right of entry to to private facts. When a login fails (i.E, the username and password aggregate does now not healthy a person account), the person is disallowed access. Many systems block users from even trying to log in after a couple of failed login tries.

Examples of logins encompass:

- Operating System login – Windows and Mac structures may be configured to require a login which will use the laptop after it is became on or woken from sleep mode. A login may also be required to put in software or regulate machine files.
- Website login – Webmail interfaces, economic web sites, and many other web sites require a username and password so that you can get admission to account facts.

- App store login – App shops like Google Play and Apple's App Store require a login to download mobile apps, tune, and different documents.
- FTP login – record switch packages frequently require a login so one can browse, ship, and acquire documents from an FTP server.
- Router login – Wired and wi-fi routers generally require an administrator login to alter the settings.

At a primary stage, logins make user debts feasible. Most systems require particular usernames, which ensures every consumer's login is exclusive. On a extra advanced stage, logins provide a security layer between unsecured and secure interest. Once a consumer logs in to a comfy internet site, for example, all facts transfers are commonly encrypted. This prevents different systems from viewing or recording the statistics transferred from the server.

SIGNUP MENU : The Sign up module has been developed using the Tkinter GUI framework written in Python. It facilitates the user to save his/her data into the Oracle database. The signup form will be explicitly used to insert the records of doctors who will be using the disease prediction system. The doctors data has been scraped from Internet for research purposes. The signup module opens the prediction window for a legitimate user and displays a message box in case of failed authentication.

3.6 Basic Evaluation of Literature Review

The development of the proposed fashions for person is researched upon as a way to come to the belief what all functions are required by using the stop user to enhance the healthcare surroundings. The literature overview creates the basis to perform similarly studies giving an idea approximately the proposed gadget. The structures just like the proposed device had been researched upon to create a base line for the device; what issues the developer can face, what are the functions that can not be applied at all.

While reviewing the literature, domain, technical and educational research have been accomplished to get the in-depth information of the features to be implemented within the proposed device and to explore the generation for use in imposing the system. Therefore, secondary studies is achieved under literature overview by using reading different's paintings with a purpose to guide the developer closer to developing the proposed device.

3.7 Critical Evaluation of Market Review

In this part investigate is done on the comparative models accessible in the market. In the wake of looking at the current frameworks, there are a few disadvantages or the cons in the frameworks which are distinguished. Above framework shows that there are hardly any models accessible in the market that are like the proposed amodels. The models to be created gives such kind of usefulness that is required for every single web based booking in the present time. The examination led brings about the need to highlights like Save up notice, just as in Secure database and so on. While building up the proposed model, the engineer can use the data gave by the comparative applications and furthermore can incorporate possess new thoughts into the current thoughts. Since the comparative model have demonstrated to be very compelling in genuine world, and the whole look into offers help to the designer for better comprehension in making the entire model. The proposed model in this manner will be proficient in upgrading the shopping involvement with retail condition.

3.8 Critical Success Factor

These are the models of machine learning developers just need to change the database of the model so they are easy for everyone to use it in efficient manner and they provide a better accuracy than all models which are developed on other platforms. We are also providing url through which they can consult with their doctors .they get the consultancy at 24*7 services.

3.9 Conclusion

Chapter 3 includes assessment the literature of the beyond to set up a baseline for the proposed project. Under literature assessment, current systems were studied to acquire understanding in the area of the study; what features are new within the market and what all capabilities the developer can combine into his new system. The bankruptcy additionally includes the records and sources which are part of the literature evaluation and are research or will be studied in destiny to gather the data and statistics approximately the region of take a look at.

CHAPTER 4: RESEARCH METHODS

4.1 Research Methods

4.1.1 Primary Research

Primary research is described as collecting statistics or the facts approximately the domain of the take a look at from the actual global directly, for the very first time about a given concern at once from the real world. It is done to cast off the confusion and ambiguitythat came within the thoughts of the developer after acting secondary research by means of in reality asking such questions directly to the forum customers and thinking about their pointers. The developer can use this studies to move similarly inside the development of the venture. The number one studies strategies used by the developer are questionnaire and interviewwhich are defined under:

4.1.2 Questionnaire

A Questionnaire consists of some of questions published in a chunk of paper in a particular order to elicit essential facts from the goal users within a short duration. The Questionnaire is furnished to the respondents who're predicted to read and recognize the questions and write down the respond inside the space furnished. Since, user is the varieties of users for the proposed gadget; the developer will distribute the questionnaire among them.

Justification for Conducting Questionnaire

The cause for choosing questionnaire as a primary records accumulating technique is defined below:

- Since the target customers of the device are pretty huge in number, and it is not possible to attain out to every of them for my part to gather their necessities and hints.
- With questionnaire, it's far possible to attain to hundreds concurrently no matter their geological area that is less time eating.
- Since, the statistical techniques may be implemented to it the evaluation of questionnaire is efficientwhich is executed within the phrases of graphs and charts that are extra accurate.

- Users are free to reply questions anonymously, so there are more chances of obtaining actual necessities.
- It’s a cost-effective method, asit can be emailed to the members or be dispensed as paper-based totally questionnaire.

Questionnaire for Customer

QUESTIONNAIRE

A STUDY TO ANALYZE HOW TO ENHANCE MEDICAL INFRATSUTURE FOR ONLINE SCHEDULING AND VISITS

Respected Sir/Mam,

First of all, we thank you for being part of our survey. This survey asks approximately your experiences booking the assembly with dr .

The researcher is a very last 12 months scholar of College name, Panipat pursuing B Tech inside the move of Computer Science. For primary studies paintings and amassing records is achieved by means of survey for final 12 months task. Researcher is kindly asking for you to spare a few minutes to undergo the questions and assist us to finish this survey by filling those beneath questions. Questions have been cautiously designed with the aid of following all of the ethical tips for the studies paintings of the Kurukshetra University. The title of the challenge is “Medical Infrastructure Management by way of Scheduling Visits and Online Access”. The purpose of this survey is to find out the troubles confronted with the aid of the user even as reserving the visits , scheduling that is major problem now a day and how to conquer from this hassle.

This survey will help the developer to recognise the various preferences of the consumer and to alter the presently to be had device. The consequences of this assessment may be very beneficial in getting essential information for growing a gadget mastering models.

Instruction

This questionnaire sections will assist the researcher to estimate about the undertaking research deliverables. It is vital which you solution all relevant questions very well.

Section A: - This section is elective and contains of your private and expert info.

Section B: - Check the maximum appropriate alternatives from the questions below, you may test greater than one choice primarily based on the necessities.

Section C: - Feel free to proportion your views/ tips and assist researcher to understand the primary necessities.

Your response to this survey or any particular question is completely confidential. Your identity will not berevealed and the data here obtained will only be used for statistical purposes only.

4.1.2 Interview

Interview is a type of primary research method in which a set of questions are pre-planned and are asked to the interviewee **face to face**. The questions are generally open ended. It is designed to assemble detailed information about a topic. For the proposed system, those questions are asked in the interviews whose answers require bit detail description to understand the requirement. The interviewees for the proposed system is developer. The purpose was to get an exclusive view of the users to gather maximum information about the system requirements.

Justification for Conducting Interview

The reason for choosing interview as a primary research method is as follows:

- It provides first-hand information so more chances of getting actual facts and quality rich data, new insights and conclusions.
- It will help in gathering detailed information about the functionalities of the propose system as it is best for investigating problems.
- Apart from what they say, a person’s feelings, thoughts, gestures can be noticed which can enable the interviewer to confirm that what they discuss is right or wrong.

4.2 Secondary Research

Secondary research is usually conducted prior to primary research. It means gathering information from already published books, journals, research papers which are third party authenticated sources. It is done to learn from the mistakes that others have committed on the related domain because it is better to learn from other’s mistakes and save time rather than repeating the same mistake.

4.2.1 Technical Research

This is related to the technical part of the research means research related to selection of platform, programming language, database, technology and methodology. Conducting technical research for the proposed project is a critical factor that can affect the implementation of the project and thus is conducted before the system design and implementation phase begins. A wide-spread research is conducted that compares various platforms, programming languages, databases, technologies, methodologies and evaluates them to come to conclusion which would be chosen for the proposed project.

Justification for Choosing Machine learning

The decision of choosing one platform over other has always been a difficult task for the developer. Each platform has its own pros and cons so it is inadequate to say that one platform is better than other ones. Let’s see why **Machine learning** has been chosen over other platforms.

What is Machine Learning?

Machine learning (ML) is the scientific study of algorithms and statistical models that computer systems use to perform a specific task without using explicit instructions, relying on patterns and inference instead. It is seen as a subset of artificial intelligence. Machine learning algorithms build a mathematical model based on sample data, known as "training data", in order to make predictions or decisions without being explicitly programmed to perform the task.Machine learning algorithms are used in a wide variety of applications, such as email filtering and computer vision, where it is difficult or infeasible to develop a conventional algorithm for effectively performing the task.

Machine learning is closely related to computational statistics, which focuses on making predictions using computers. The study of mathematical optimization delivers methods, theory and application domains to the field of machine learning. Data mining is a field of study within machine learning, and focuses on exploratory data analysis through unsupervised learning. In its application across business problems, machine learning is also referred to as predictive analytics.

Types of learning algorithms

The types of machine learning algorithms differ in their approach, the type of data they input and output, and the type of task or problem that they are intended to solve.

Supervised learning

Regulated learning calculations assemble a scientific model of a lot of information that contains both the sources of info and the ideal outputs.The information is known as preparing information, and comprises of a lot of preparing models. Each preparation model has at least one sources of info and an ideal yield, otherwise called a supervisory sign. In the scientific model, each preparation model is spoken to by a cluster or vector, here and there called an element vector, and the preparation information is spoken to by a lattice. Through iterative advancement of a goal work, managed learning calculations become familiar with a capacity that can be utilized to anticipate the yield related with new inputs. An ideal capacity will enable the calculation to accurately decide the yield for inputs that were not a part of the preparation information. A calculation that improves the exactness of its yields or expectations after some time is said to have figured out how to play out that task.

Regulated learning calculations incorporate arrangement and regression. Classification calculations are utilized when the yields are confined to a restricted arrangement of qualities, and relapse calculations are utilized when the yields may include any numerical incentive inside a range. Comparability learning is a zone of administered AI firmly identified with relapse and grouping, however the objective is to gain from models utilizing a likeness work that estimates how comparative or related two items are. It has applications in positioning, proposal frameworks, visual personality following, face confirmation, and speaker check.

On account of semi-administered learning calculations, a portion of the preparation models are missing preparing names, however they can by the by be utilized to improve the nature of a model. In feebly administered learning, the preparation names are loud, restricted, or loose; in any case, these names are regularly less expensive to get, bringing about bigger powerful preparing sets.

Unaided learning

Unaided learning calculations take a lot of information that contains just sources of info, and discover structure in the information, such as gathering or bunching of information focuses. The calculations hence gain from test information that has not been named, ordered or arranged. Rather than reacting to criticism, solo learning calculations distinguish shared characteristics in the information and respond dependent on the nearness or nonattendance of such shared traits in each new bit of information. A focal use of unaided learning is in the field of thickness estimation in statistics, however solo learning incorporates different areas including outlining and clarifying information highlights.

Group investigation is the task of a lot of perceptions into subsets (called bunches) so perceptions inside a similar bunch are comparative as indicated by at least one predesignated criteria, while perceptions drawn from various bunches are unique. Distinctive grouping systems make various suppositions on the structure of the information, regularly characterized by some comparability metric and assessed, for instance, by inside conservativeness, or the similitude between individuals from a similar bunch, and detachment, the contrast between bunches. Different strategies depend on evaluated thickness and chart availability.

Fortification learning

Fortification learning is a zone of AI worried about how programming operators should take activities in a situation in order to boost some idea of aggregate compensate. Because of its sweeping statement, the field is contemplated in numerous different orders, for example, game hypothesis, control hypothesis, activities examine, data hypothesis, recreation based streamlining, multi-specialist frameworks, swarm insight, measurements and hereditary calculations. In AI, the earth is regularly spoken to as a Markov Decision Process (MDP). Numerous support learning calculations use dynamic programming techniques. Reinforcement learning calculations don't accept information on a definite scientific model of the MDP, and are utilized when precise models are infeasible. Fortification learning calculations are utilized in self-ruling vehicles or in figuring out how to play a game against a human adversary.

Self learning

Self learning as AI worldview was presented in 1982 alongside a neural system fit for self-learning named Crossbar Adaptive Array (CAA). It is a learning with no outside remunerations and no outer educator advices. The CAA self learning calculation registers, in a crossbar design, the two choices about activities and feelings (sentiments) about outcome circumstances. The framework is driven by the collaboration among insight and feeling. oneself learning calculation refreshes a memory lattice W =||w(a,s)|| with the end goal that in every emphasis executes the accompanying AI schedule:

Traditional Programming

Traditional programming is a manual process—meaning a person (programmer) creates the program. But without anyone programming the logic, one has to manually formulate or code rules.

In machine learning, on the other hand, the algorithm automatically formulates the rules from the data.

Machine Learning

Unlike traditional programming, machine learning is an automated process. It can increase the value of your embedded analytics in many areas, including data prep, natural language interfaces, automatic outlier detection, recommendations, and causality and significance detection. All of these features help speed user insights and reduce decision bias.

For example, if you feed in customer demographics and transactions as input data and use historical customer churn rates as your output data, the algorithm will formulate a program that can predict if a customer will churn or not. That program is called a **predictive model**.

4.2.2 Development Methodology

As illustrated through (Erickson, 2005) software program technique offers a systematic pathway or a road map for the a hit improvement of software program. It enables to reduce risks; assist handle the complexity of the software program and increase the software inside finances and time with satisfying requirements with high-quality. It enables to decide if the development is deviating from the scheduled plan.The developer has evaluated almost all of the to be had methodologies to come up with the quality suitable methodology that would meet the requirements of the undertaking inclusive of technical, agency and mission issues. After a brief analysis and studies study of the software development methodologies, the developer has concluded to enforce “V-MODEL” for the development of the challenge.

V-model Methodology

After reviewing all software methologies, the developer choose “V-MODEL” as it suits in with the restrictions of the undertaking. Any form of adjustments within the machine can be carried out at a minimal fee due to its frequency of new increments that are produced. The changes may be mentioned and capabilities may be improvised or deleted based totally on the feedback. This could effectively give its patron the completed device they need or need. This technique, divides its duties into smaller time frames so that goals may be carried out.

Phases of V-Model Methodology

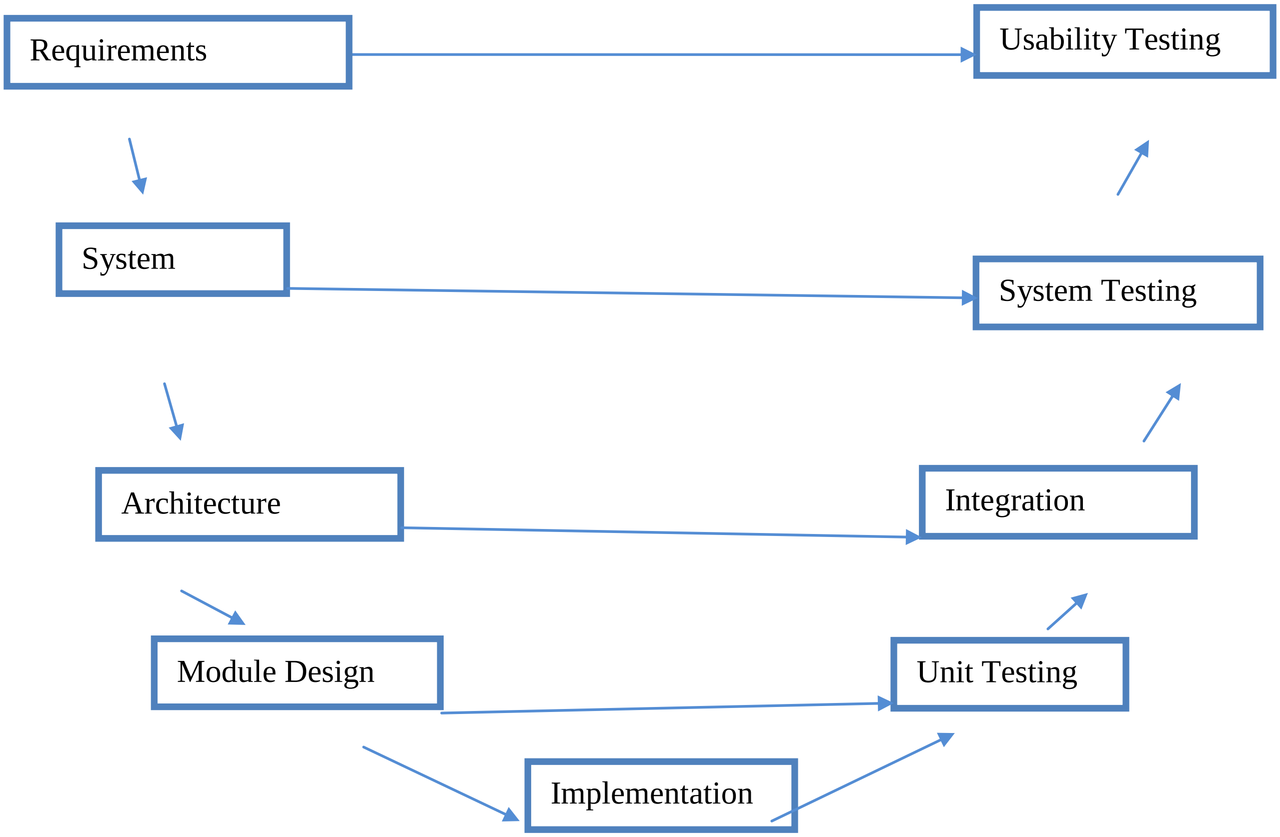


Fig 4.1 : Phases of V-Model Methodology

This methodology has following phase that developer will pursue whilst developing the gadget.

- Requirement Analysis-It is the first step within the verification process. In this level the developer will now not be going to planned how the machine goes to be constructed; it is going to be a generalized dialogue and a user requirement report is positioned onwards. This document will convey statistics regarding the characteristic of the gadget, overall performance, security, records, interface and so on. This report is required via the business analysts to deliver the function of the machine to the customers. Meanwhile it'll really be a recommendation.

- System Design-In this level the possible layout of the product is expressed. It is framed after keeping in mind the requirement summaries. Furthermore, even as pursuing the documents, if there is rather that doesn’t appropriate within the layout, then the developer is made responsive of it and changes are therefore scheduled.

- Architecture Design- It is also called the laptop architecture layout or the software layout must understand the modules and the functionality of the modules which need to be incorporated.

- Module Design-In this degree, the architectural design is again fragmented into sub additives thus they may be planned and defined especially. The devices are called modules. It can separately be decrypted with the aid of the programmer.

The Validation Phases of the V version

- Unit Testing-It is layout in the module design segment are finished on the code in the course of this validation section. Unit checking out is the trying out at code stage and enables reduce bugs at an early level, but all faults cannot be discovered by unit trying out.

- Integration Testing or Interface Testing- It is associated with the architectural layout segment. Integration exams are executed to test the lifestyles and conversation of the internal modules within the machine. In different words, on this section the separate entities can be tested together to discover the faults within the interfaces.

- System Testing-It is without delay allied with the System layout phase. Its check the complete system functionality and the assertion of the gadget under development with peripheral systems. In addition, maximum of the software and hardware compatibility troubles can be found out in the course of device test execution.

- Acceptance Testing-In the acceptance trying out, related with the business requirement evaluation section and comprises checking out the product in user environment. It exposes the compatibility troubles with the opposite structures handy inside the user environment. Acceptance tests additionally determines the non-practical worries which includes load and overall performance faults inside the actual consumer surroundings.

- Release Testing-It is in presently that decision must be made if the product or software program that is created is appropriate for the cease person.

Justification for choosing V-Model

After a few discussion, the developer chooses Waterfall Model for the improvement of this machine. The most appealing thing for selection of V-Model is-

- Stable assignment necessities: As in our project most of the user necessities are restriction on the time of PSF so it specifies an unchanging project requirements and Waterfall method entirely helps a challenge which has necessities definite earlier.

- Progress of machine is measurable: After every section, it produces the documentation and as the structure of our Final year mission we need to put up the documentation after each segment so it is going to be fine appropriate.

- Strict signal-off requirements: As the builders intention will be to content the user and till the user might be gratified the developer may be providing the person favored functionalities and right features so this methodology can be nice suitable.

- The highlighting on necessities and design earlier than writing a unmarried line of code confirms minimal wastage of time and effort and decreases the threat of time table slippage, or of end user expectancies no longer being met.

- In modified waterfall model life cycle levels are acceptable to overlay. Because of the phases overlap, plenty of suppleness has been familiarized within the changed waterfall version in software program engineering. Meanwhile, a number of responsibilities can feature simultaneously, which ensures that the defects within the software program are removed inside the development degree itself and the overhead fee of making adjustments to the software program before implementation is saved.

- Making modifications to the fundamental design is also feasible, as there are some of phases lively at one factor of time. In condition, there are any mistakes delivered because of the modifications made, rectifying them is likewise easy (Testing may be finished). This allows to lessen any error worries.

4.3 Conclusion

Chapter 4 is being all about the research strategies. The researcher conducted number one and secondary studies below which technical research turned into carried out to come to a final end of person requirements and technologies and tools to be used. Couple of research strategies were used by the developer, which includes Questionnaires and Interviews. The research changed into necessary to avoid waste of time in a later factor of development section. Now, the researcher is pretty certain of the functions to be protected in the gadget and how to do away with current troubles. The developer is confident enough to put in force the proposed app after appearing severe research associated with area, technology, language, gear etc.

CHAPTER 5: ANALYSIS

5.1 Analysis of Questionnaire

Refer to appendix

5.1.1 Overall Conclusion of Questionnaire

The questionnaires were distributed among the users like student, service man, business man etc. This type of primary research which is a kind of survey is beneficial for the developer in knowing the user's point of views about the problems faced by the user while getting the general ticket at the railway counter and how this can be enhanced in the railway environment. The survey performed using the questionnaire helped the developer to have a complete knowledge and understanding of the requirement of the customers while getting the general ticket. So, their opinions helped the developer to include the functionalities preferred by such users.

5.2.1 Overall Conclusion of Interview

The research was conducted to gather the opinions of the developer about the proposed application to be developed. The type of research helped the developer a lot in identifying the problems faced by the users while booking the general ticket in offline mode in railway environment and what can be the convenient solutions for the problems mentioned. The developer of the proposed system acquired knowledge about the required functionalities, pros and cons of each module only by the actual end-users who are going to implement the system. Thus, the developer targeted the user who are willing to travel by the train and want to get the general ticket online where such a system could be implemented. So, through this research, the developer will be able to develop the proposed app in a productive manner, by integrating some new features and modules like QR Scanner, Add the balance into the TTEs account, e-wallet etc.

CHAPTER 6: SYSTEM DESIGN

6.1 Introduction

The design phase starts when the developer is done with the research and analysis phase. The design phase includes the transformation of user's specifications and software components into the software interface to build a platform for establishing the system. It covers the building of blue prints of the system that include physical modelling using software engineering tools and methods.

In the design phase for the proposed system, the design is taking the requirements as the input and will produce a guideline for the implementation as output. Three to four design elements are to be produced for each and every module after completing the research and analysis part which will be fed as input to the design.

6.2 UML Diagram

Use Cases: Use case will be required by the developer so that the flow of the functionalities mentioned in the proposed system could be reviewed to validate the architecture and evaluation of the complexity level of individual modules could be assessed easily. Therefore, it would be helpful in testing the system through forward and reverse engineering. (Booch, Rumbaugh & Jacobson, 2008)

Activity Diagrams: Activity Diagrams will be used by the developer to show the flow of control of program modules from activity to activity. This would help us to show the concurrency as well as branches of control in the proposed system. (Booch, Rumbaugh & Jacobson, 2008)

Sequence Diagrams: Sequence Diagrams would help the developer to show the series of interactions prevailing between users and system/modules. (Booch, Rumbaugh & Jacobson, 2008)

Class Diagrams: UML class diagrams will be required to provide an independent description of the objects that would be used in the system and which would be helpful in the implementation phase. The design can be used as a reference to implement on any platform using any development environment. (Booch, Rumbaugh & Jacobson, 2008)

Entity-Relationship Diagram (ERD): ER diagrams will be required by the developer to identify the entities and relationship between them is beneficial in storing the data which would be then converted into tables in the normalization phase. (Booch, Rumbaugh & Jacobson, 2008)

6.2.1 Use Case

⇘ **Use Case Diagram of Login**

UC-01

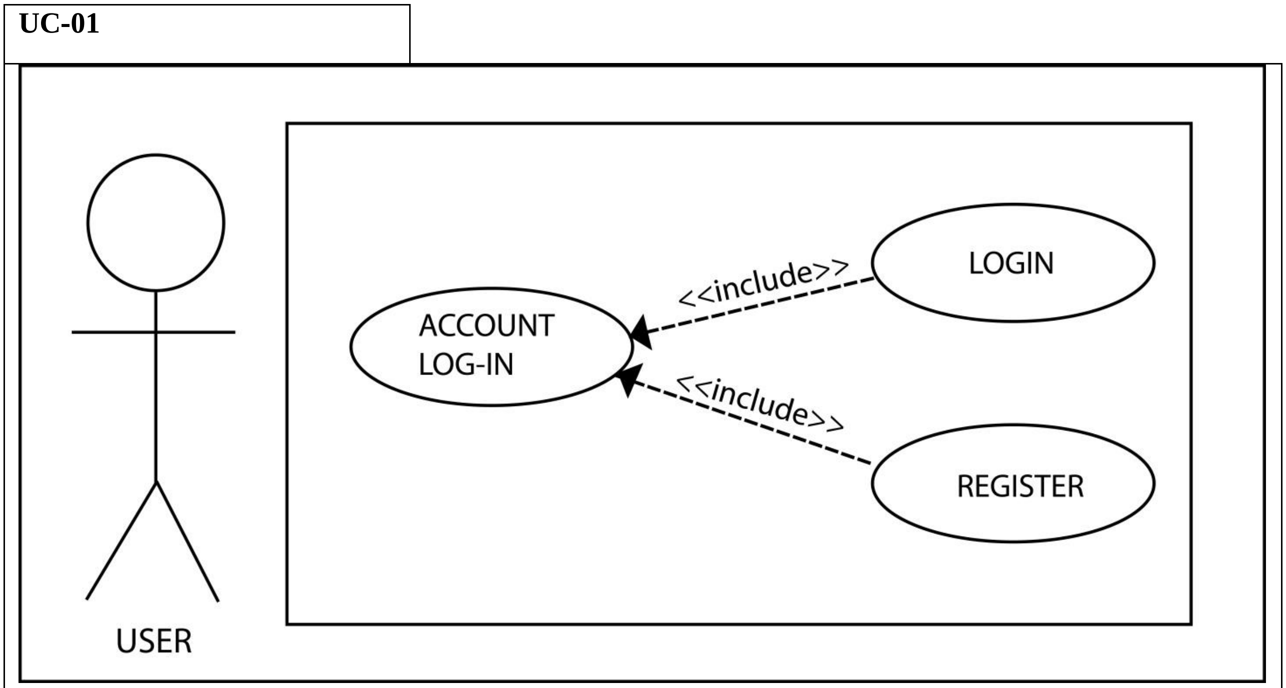


Table 6.1: Use Case Diagrams of Login

Use Case ID	**UC-01**
Use Case Name	Login

Description	This allows the user to sign in to his account.
Actor(s)	User/TTE/Admin
Assumption	➥ Actor must have internet connectivity for signing in.
Pre-Condition	➥ The actor must be a registered user.
Post-Condition	➥ Signed In successfully.
Primary Pathway	➥ Actor taps on **Log In** button from the software dashboard. ➥ Actor enters user name and password. ➥ Actor clicks on sign in.
Alternate Pathway(s)	➥ Necessary to sign in to synchronize. ➥ Repeat steps 2 and 3 of primary pathway.
Exception Pathway	➥ Actor enters username and password. ➥ The email or password is incorrect/does not exist in database. ➥ System asks the actor to re-enter the username/password. ➥ Go to step 2 of primary pathway.

Table 6.2: Use Case Description of Login

➥ Use Case Diagrams for User Module

UC-02

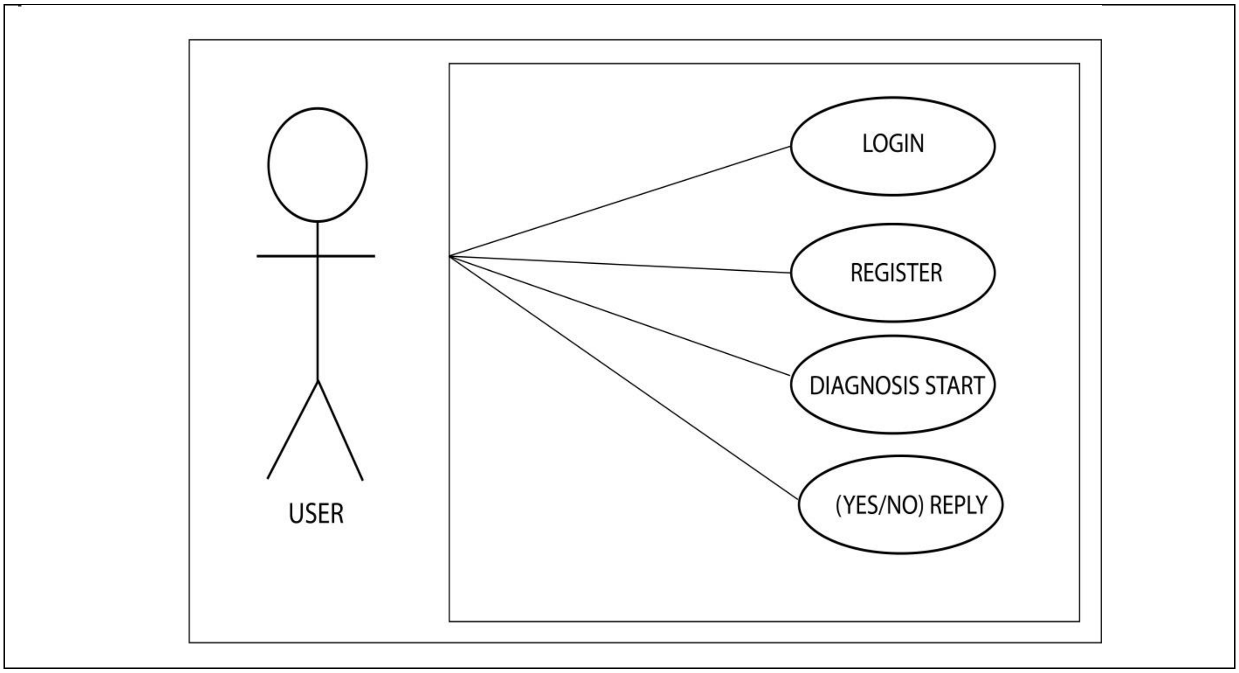


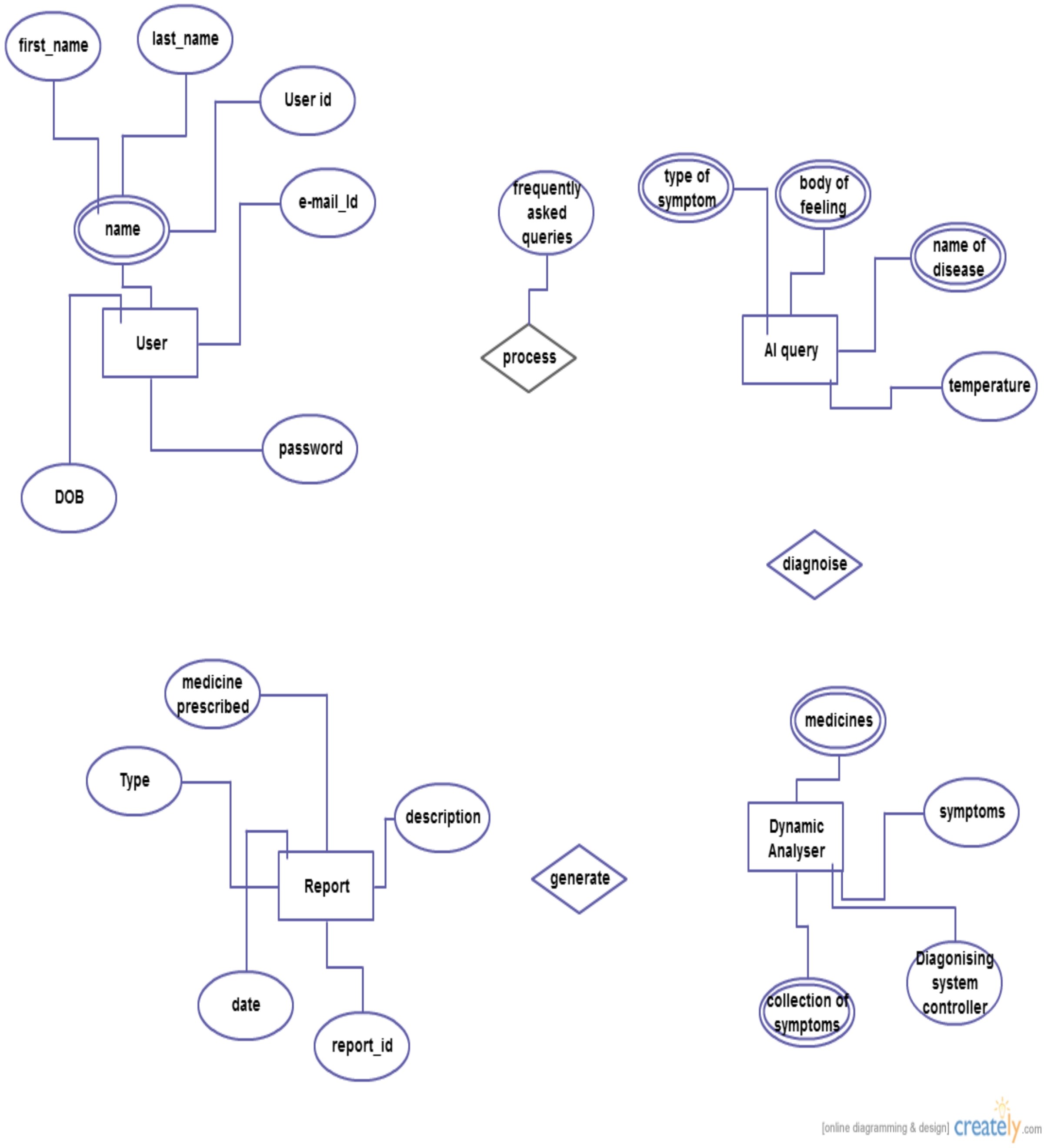
Table 3.3: Use Case Diagrams of User

Use Case ID	**UC-02**
Use Case Name	User Module
Description	User can Register, Login, start Diagnosis, reply to the queries asked by chatbot (yes /no).
Actor(s)	All the User of the system
Assumption	➢ User must know the user interface of chatbot
Pre-Condition	➢ User must have an system which supports the software requirements.
Post-Condition	➢ User get a chatbot which chats with the user.
Primary Pathway	➢ User respond to the chatbot when it ask syptoms. ➢ Chabot declare the disease and provide the contact of the expertise Doctor.
Alternate Pathway(s)	None

Exception Pathway	➪ It may happen that at the time of login user enter the incorrect username and password.

Table 6.4: Use Case Description of User Module

6.2.2 ER diagram



CHAPTER 7: CODING

7.1 Healthcare_chatbotConsole.py

```
######## A Healthcare Domain Chatbot to simulate the predictions of a General Physician ########

######## A pragmatic Approach for Diagnosis ############


 # Importing the libraries

import numpy as np

import matplotlib.pyplot as plt

import pandas as pd


# Importing the dataset

training_dataset = pd.read_csv('Training.csv')

test_dataset = pd.read_csv('Testing.csv')


# Slicing and Dicing the dataset to separate features from predictions

X = training_dataset.iloc[:, 0:132].values

y = training_dataset.iloc[:, -1].values


# Dimensionality Reduction for removing redundancies

dimensionality_reduction = training_dataset.groupby(training_dataset['prognosis']).max()


# Encoding String values to integer constants

from sklearn.preprocessing import LabelEncoder

labelencoder = LabelEncoder()
```

```
y = labelencoder.fit_transform(y)


# Splitting the dataset into training set and test set
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y,
test_size = 0.25, random_state = 0)


# Implementing the Decision Tree Classifier
from sklearn.tree import DecisionTreeClassifier
classifier = DecisionTreeClassifier()
classifier.fit(X_train, y_train)


# Saving the information of columns
cols     = training_dataset.columns
cols     = cols[:-1]



# Checking the Important features
importances = classifier.feature_importances_
indices = np.argsort(importances)[::-1]
features = cols


# Implementing the Visual Tree
from sklearn.tree import _tree


# Method to simulate the working of a Chatbot by extracting and
formulating questions
def execute_bot():
    print("Please reply with yes/Yes or no/No for the following
symptoms")

    def print_disease(node):

        #print(node)

        node = node[0]

        #print(len(node))

        val  = node.nonzero()

        #print(val)

        disease = labelencoder.inverse_transform(val[0])

        return disease

    def tree_to_code(tree, feature_names):

        tree_ = tree.tree_

        #print(tree_)

        feature_name = [

            feature_names[i] if i != _tree.TREE_UNDEFINED else
"undefined!"

            for i in tree_.feature

        ]

        #print("def tree({}):".format(", ".join(feature_names)))

        symptoms_present = []

        def recurse(node, depth):

            indent = "  " * depth

            if tree_.feature[node] != _tree.TREE_UNDEFINED:

                name = feature_name[node]

                threshold = tree_.threshold[node]

                print(name + " ?")

                ans = input()
                ans = ans.lower()
                if ans == 'yes':
                    val = 1
                else:
                    val = 0
                if  val <= threshold:
                    recurse(tree_.children_left[node], depth + 1)
                else:
                    symptoms_present.append(name)
                    recurse(tree_.children_right[node], depth +
1)
            else:
                present_disease =
print_disease(tree_.value[node])
                print( "You may have " +  present_disease )
                print()
                red_cols = dimensionality_reduction.columns
                symptoms_given =
red_cols[dimensionality_reduction.loc[present_disease].values[0].
nonzero()]
                print("symptoms present  " +
str(list(symptoms_present)))
                print()
                print("symptoms given "  +
str(list(symptoms_given)) )
                print()
                confidence_level =
(1.0*len(symptoms_present))/len(symptoms_given)
                print("confidence level is " +
str(confidence_level))
```

```
                print()

                print('The model suggests:')

                print()

                row = doctors[doctors['disease'] ==
present_disease[0]]

                print('Consult ', str(row['name'].values))

                print()

                print('Visit ', str(row['link'].values))

                #print(present_disease[0])



        recurse(0, 1)


    tree_to_code(classifier,cols)




# This section of code to be run after scraping the data


doc_dataset = pd.read_csv('doctors_dataset.csv', names = ['Name',
'Description'])




diseases = dimensionality_reduction.index

diseases = pd.DataFrame(diseases)


doctors = pd.DataFrame()

doctors['name'] = np.nan
```

```
doctors['link'] = np.nan
doctors['disease'] = np.nan

doctors['disease'] = diseases['prognosis']



doctors['name'] = doc_dataset['Name']
doctors['link'] = doc_dataset['Description']

record = doctors[doctors['disease'] == 'AIDS']
record['name']
record['link']

# Execute the bot and see it in Action
execute_bot()
```

7.2 Newlogin.py

```
# import modules

from tkinter import *
import os



# Designing window for registration
def destroyPackWidget(parent):
    for e in parent.pack_slaves():
        e.destroy()
```

```
def register():
    global root,register_screen

    destroyPackWidget(root)
    register_screen=root
#     register_screen = Toplevel(main_screen)
    register_screen.title("Register")
    register_screen.geometry("300x250")

    global username
    global password
    global username_entry
    global password_entry
    username = StringVar()
    password = StringVar()

    Label(register_screen, text="Please enter details below", 
bg="blue").pack()
    Label(register_screen, text="").pack()
    username_lable = Label(register_screen, text="Username * ")
    username_lable.pack()
    username_entry = Entry(register_screen, 
textvariable=username)
    username_entry.pack()
    password_lable = Label(register_screen, text="Password * ")
    password_lable.pack()
    password_entry = Entry(register_screen, 
textvariable=password, show='*')
```

```
    password_entry.pack()

    Label(register_screen, text="").pack()

    Button(register_screen, text="Register", width=10, height=1, 
bg="blue", command=register_user).pack()



# Designing window for login


def login():

    global login_screen

    login_screen = Toplevel(main_screen)

    login_screen.title("Login")

    login_screen.geometry("300x250")

    Label(login_screen, text="Please enter details below to 
login").pack()

    Label(login_screen, text="").pack()


    global username_verify

    global password_verify


    username_verify = StringVar()

    password_verify = StringVar()


    global username_login_entry

    global password_login_entry


    Label(login_screen, text="Username * ").pack()
    username_login_entry = Entry(login_screen, 
textvariable=username_verify)

    username_login_entry.pack()

    Label(login_screen, text="").pack()

    Label(login_screen, text="Password * ").pack()

    password_login_entry = Entry(login_screen, 
textvariable=password_verify, show='*')

    password_login_entry.pack()

    Label(login_screen, text="").pack()

    Button(login_screen, text="Login", width=10, height=1, 
command=login_verify).pack()



# Implementing event on register button

def btnSucess_Click():

    global root

    destroyPackWidget(root)

def register_user():

    global root,username,password

    username_info = username.get()

    password_info = password.get()

    print("abc",username_info,password_info,"xyz")

    file = open(username_info, "w")

    file.write(username_info + "\n")

    file.write(password_info)

    file.close()


    username_entry.delete(0, END)
    password_entry.delete(0, END)


    Label(root, text="Registration Success", fg="green",
font=("calibri", 11)).pack()
    Button(root,text="Click Here to
proceed",command=btnSucess_Click).pack()



# Implementing event on login button


def login_verify():
    username1 = username_verify.get()
    password1 = password_verify.get()
    username_login_entry.delete(0, END)
    password_login_entry.delete(0, END)

    list_of_files = os.listdir()
    if username1 in list_of_files:
        file1 = open(username1, "r")
        verify = file1.read().splitlines()
        if password1 in verify:
            login_sucess()

        else:
            password_not_recognised()

    else:
        user_not_found()
```

```
# Designing popup for login success

def login_sucess():
    global login_success_screen
    login_success_screen = Toplevel(login_screen)
    login_success_screen.title("Success")
    login_success_screen.geometry("150x100")
    Label(login_success_screen, text="Login Success").pack()
    Button(login_success_screen, text="OK",
command=delete_login_success).pack()



# Designing popup for login invalid password

def password_not_recognised():
    global password_not_recog_screen
    password_not_recog_screen = Toplevel(login_screen)
    password_not_recog_screen.title("Success")
    password_not_recog_screen.geometry("150x100")
    Label(password_not_recog_screen, text="Invalid Password
").pack()
    Button(password_not_recog_screen, text="OK",
command=delete_password_not_recognised).pack()



# Designing popup for user not found
```

```
def user_not_found():
    global user_not_found_screen
    user_not_found_screen = Toplevel(login_screen)
    user_not_found_screen.title("Success")
    user_not_found_screen.geometry("150x100")
    Label(user_not_found_screen, text="User Not Found").pack()
    Button(user_not_found_screen, text="OK",
command=delete_user_not_found_screen).pack()


# Deleting popups

def delete_login_success():
    login_success_screen.destroy()


def delete_password_not_recognised():
    password_not_recog_screen.destroy()


def delete_user_not_found_screen():
    user_not_found_screen.destroy()


# Designing Main(first) window
```

```
def main_account_screen(frmmain):
    main_screen=frmmain


    main_screen.geometry("300x250")
    main_screen.title("Account Login")
    Label(main_screen,text="Select Your Choice", bg="blue",
width="300", height="2", font=("Calibri", 13)).pack()
    Label(main_screen,text="").pack()
    Button(main_screen,text="Login", height="2", width="30",
command=login).pack()
    Label(main_screen,text="").pack()
    Button(main_screen,text="Register", height="2", width="30",
command=register).pack()




root = Tk()
main_account_screen(root)


root.mainloop()
```

7.3 Question_diagnosistkinter.py

```
######## A Healthcare Domain Chatbot to simulate the predictions
of a General Physician ########
######## A pragmatic Approach for Diagnosis ############


# Importing the libraries
from tkinter import *
from tkinter import messagebox
```

```
import os

import webbrowser


import numpy as np

import pandas as pd



class HyperlinkManager:


    def __init__(self, text):


        self.text = text


        self.text.tag_config("hyper", foreground="blue",
underline=1)


        self.text.tag_bind("hyper", "<Enter>", self._enter)

        self.text.tag_bind("hyper", "<Leave>", self._leave)

        self.text.tag_bind("hyper", "<Button-1>", self._click)


        self.reset()


    def reset(self):

        self.links = {}


    def add(self, action):

        # add an action to the manager.  returns tags to use in
        # associated text widget
        tag = "hyper-%d" % len(self.links)
        self.links[tag] = action
        return "hyper", tag

    def _enter(self, event):
        self.text.config(cursor="hand2")

    def _leave(self, event):
        self.text.config(cursor="")

    def _click(self, event):
        for tag in self.text.tag_names(CURRENT):
            if tag[:6] == "hyper-":
                self.links[tag]()
                return

# Importing the dataset
training_dataset = pd.read_csv('Training.csv')
test_dataset = pd.read_csv('Testing.csv')

# Slicing and Dicing the dataset to separate features from
predictions
X = training_dataset.iloc[:, 0:132].values
Y = training_dataset.iloc[:, -1].values

# Dimensionality Reduction for removing redundancies
```

```
dimensionality_reduction =
training_dataset.groupby(training_dataset['prognosis']).max()


# Encoding String values to integer constants

from sklearn.preprocessing import LabelEncoder

labelencoder = LabelEncoder()

y = labelencoder.fit_transform(Y)


# Splitting the dataset into training set and test set

from sklearn.model_selection import train_test_split

X_train, X_test, y_train, y_test = train_test_split(X, y,
test_size = 0.25, random_state = 0)


# Implementing the Decision Tree Classifier

from sklearn.tree import DecisionTreeClassifier

classifier = DecisionTreeClassifier()

classifier.fit(X_train, y_train)


# Saving the information of columns

cols     = training_dataset.columns

cols     = cols[:-1]



# Checking the Important features

importances = classifier.feature_importances_

indices = np.argsort(importances)[::-1]

features = cols
```

```
# Implementing the Visual Tree
from sklearn.tree import _tree


# Method to simulate the working of a Chatbot by extracting and
formulating questions
def print_disease(node):
        #print(node)
        node = node[0]
        #print(len(node))
        val  = node.nonzero()
        #print(val)
        disease = labelencoder.inverse_transform(val[0])
        return disease
def recurse(node, depth):
            global val,ans
            global tree_,feature_name,symptoms_present
            indent = "  " * depth
            if tree_.feature[node] != _tree.TREE_UNDEFINED:
                name = feature_name[node]
                threshold = tree_.threshold[node]
                yield name + " ?"
#                ans = input()
                ans = ans.lower()
                if ans == 'yes':
                    val = 1
                else:
                    val = 0
                if  val <= threshold:
                    yield from recurse(tree_.children_left[node],
depth + 1)
                else:
                    symptoms_present.append(name)
                    yield from
recurse(tree_.children_right[node], depth + 1)
            else:
                strData=""
                present_disease =
print_disease(tree_.value[node])
#                print( "You may have " +  present_disease )
#                print()
                strData="You may have :" +  str(present_disease)


QuestionDigonosis.objRef.txtDigonosis.insert(END,str(strData)+'\n
')


                red_cols = dimensionality_reduction.columns
                symptoms_given =
red_cols[dimensionality_reduction.loc[present_disease].values[0].
nonzero()]
#                print("symptoms present  " +
str(list(symptoms_present)))
#                print()
                strData="symptoms present:  " +
str(list(symptoms_present))

QuestionDigonosis.objRef.txtDigonosis.insert(END,str(strData)+'\n
')
```

```
#                print("symptoms given "  +
str(list(symptoms_given)) )

#                print()

                strData="symptoms given: "  +
str(list(symptoms_given))


QuestionDigonosis.objRef.txtDigonosis.insert(END,str(strData)+'\n
')

                confidence_level =
(1.0*len(symptoms_present))/len(symptoms_given)

#                print("confidence level is " +
str(confidence_level))

#                print()

                strData="confidence level is: " +
str(confidence_level)


QuestionDigonosis.objRef.txtDigonosis.insert(END,str(strData)+'\n
')

#                print('The model suggests:')

#                print()

                strData='The model suggests:'


QuestionDigonosis.objRef.txtDigonosis.insert(END,str(strData)+'\n
')

                row = doctors[doctors['disease'] ==
present_disease[0]]

#                print('Consult ', str(row['name'].values))

#                print()

                strData='Consult '+ str(row['name'].values)


QuestionDigonosis.objRef.txtDigonosis.insert(END,str(strData)+'\n
')
```

```
#                print('Visit ', str(row['link'].values))
                #print(present_disease[0])
                hyperlink = 
HyperlinkManager(QuestionDigonosis.objRef.txtDigonosis)
                strData='Visit '+ str(row['link'].values[0])
                def click1():

webbrowser.open_new(str(row['link'].values[0]))

QuestionDigonosis.objRef.txtDigonosis.insert(INSERT, strData, 
hyperlink.add(click1))

#QuestionDigonosis.objRef.txtDigonosis.insert(END,str(strData)+'\
n')
                yield strData


def tree_to_code(tree, feature_names):
        global tree_,feature_name,symptoms_present
        tree_ = tree.tree_
        #print(tree_)
        feature_name = [
            feature_names[i] if i != _tree.TREE_UNDEFINED else 
"undefined!"
            for i in tree_.feature
        ]
        #print("def tree({}):".format(", ".join(feature_names)))
        symptoms_present = []
#        recurse(0, 1)
```

```
def execute_bot():
#    print("Please reply with yes/Yes or no/No for the following
symptoms")
    tree_to_code(classifier,cols)



# This section of code to be run after scraping the data


doc_dataset = pd.read_csv('doctors_dataset.csv', names = ['Name',
'Description'])



diseases = dimensionality_reduction.index
diseases = pd.DataFrame(diseases)


doctors = pd.DataFrame()
doctors['name'] = np.nan
doctors['link'] = np.nan
doctors['disease'] = np.nan


doctors['disease'] = diseases['prognosis']



doctors['name'] = doc_dataset['Name']
doctors['link'] = doc_dataset['Description']


record = doctors[doctors['disease'] == 'AIDS']
```

```
record['name']
record['link']
# Execute the bot and see it in Action
#execute_bot()

class QuestionDigonosis(Frame):
    objIter=None
    objRef=None
    def __init__(self,master=None):
        master.title("Question")
        # root.iconbitmap("")
        master.state("z")
        master.minsize(700,350)
        QuestionDigonosis.objRef=self
        super().__init__(master=master)
        self["bg"]="light blue"
        self.createWidget()
        self.iterObj=None

    def createWidget(self):

self.lblQuestion=Label(self,text="Question",width=12,bg="bisque")
        self.lblQuestion.grid(row=0,column=0,rowspan=4)


        self.lblDigonosis = Label(self,
text="Digonosis",width=12,bg="bisque")
        self.lblDigonosis.grid(row=4, column=0,sticky="n",pady=5)
        # self.varQuestion=StringVar()
        self.txtQuestion = Text(self, width=100,height=4)
        self.txtQuestion.grid(row=0,
column=1,rowspan=4,columnspan=20)


        self.varDiagonosis=StringVar()
        self.txtDigonosis =Text(self, width=100,height=14)
        self.txtDigonosis.grid(row=4,
column=1,columnspan=20,rowspan=20,pady=5)


        self.btnNo=Button(self,text="No",width=12,bg="bisque",
command=self.btnNo_Click)
        self.btnNo.grid(row=25,column=0)
        self.btnYes = Button(self,
text="Yes",width=12,bg="bisque", command=self.btnYes_Click)
        self.btnYes.grid(row=25,
column=1,columnspan=20,sticky="e")


        self.btnClear = Button(self,
text="Clear",width=12,bg="bisque", command=self.btnClear_Click)
        self.btnClear.grid(row=27, column=0)
        self.btnStart = Button(self,
text="Start",width=12,bg="bisque", command=self.btnStart_Click)
        self.btnStart.grid(row=27,
column=1,columnspan=20,sticky="e")
    def btnNo_Click(self):
        global val,ans
        global val,ans
        ans='no'
        str1=QuestionDigonosis.objIter.__next__()
        self.txtQuestion.delete(0.0,END)
        self.txtQuestion.insert(END,str1+"\n")

    def btnYes_Click(self):
        global val,ans
        ans='yes'
        self.txtDigonosis.delete(0.0,END)
        str1=QuestionDigonosis.objIter.__next__()

        self.txtDigonosis.insert(END,str1+"\n")

    def btnClear_Click(self):
        self.txtDigonosis.delete(0.0,END)
        self.txtQuestion.delete(0.0,END)
    def btnStart_Click(self):
        execute_bot()
        self.txtDigonosis.delete(0.0,END)
        self.txtQuestion.delete(0.0,END)
        self.txtDigonosis.insert(END,"Please Click on Yes or No
for the Above symptoms in Question")
        QuestionDigonosis.objIter=recurse(0, 1)
        str1=QuestionDigonosis.objIter.__next__()
        self.txtQuestion.insert(END,str1+"\n")



class MainForm(Frame):
    main_Root = None
    def destroyPackWidget(self, parent):
        for e in parent.pack_slaves():
            e.destroy()
    def __init__(self, master=None):
        MainForm.main_Root = master
        super().__init__(master=master)
        master.geometry("300x250")
        master.title("Account Login")
        self.createWidget()
    def createWidget(self):
        self.lblMsg=Label(self, text="Select Your Choice",
bg="blue", width="300", height="2", font=("Calibri", 13))
        self.lblMsg.pack()
        self.btnLogin=Button(self, text="Login", height="2",
width="30", command=self.lblLogin_Click)
        self.btnLogin.pack()
        self.btnRegister=Button(self, text="Register",
height="2", width="30", command=self.btnRegister_Click)
        self.btnRegister.pack()
    def lblLogin_Click(self):
        self.destroyPackWidget(MainForm.main_Root)
        frmLogin=Login(MainForm.main_Root)
        frmLogin.pack()
    def btnRegister_Click(self):
        self.destroyPackWidget(MainForm.main_Root)
        frmSignUp = SignUp(MainForm.main_Root)
        frmSignUp.pack()
class Login(Frame):
    main_Root=None
    def destroyPackWidget(self,parent):
        for e in parent.pack_slaves():
            e.destroy()
    def __init__(self, master=None):
        Login.main_Root=master
        super().__init__(master=master)
        master.title("Login")
        master.geometry("300x250")
        self.createWidget()
    def createWidget(self):
        self.lblMsg=Label(self, text="Please enter details below
to login",bg="blue")
        self.lblMsg.pack()
        self.username=Label(self, text="Username * ")
        self.username.pack()
        self.username_verify = StringVar()
        self.username_login_entry = Entry(self,
textvariable=self.username_verify)
        self.username_login_entry.pack()
        self.password=Label(self, text="Password * ")
        self.password.pack()
        self.password_verify = StringVar()
        self.password_login_entry = Entry(self,
textvariable=self.password_verify, show='*')
        self.password_login_entry.pack()
        self.btnLogin=Button(self, text="Login", width=10,
height=1, command=self.btnLogin_Click)
        self.btnLogin.pack()
    def btnLogin_Click(self):

        username1 = self.username_login_entry.get()

        password1 = self.password_login_entry.get()

#         messagebox.showinfo("Failure",
self.username1+":"+password1)

        list_of_files = os.listdir()

        if username1 in list_of_files:

            file1 = open(username1, "r")

            verify = file1.read().splitlines()

            if password1 in verify:

                messagebox.showinfo("Sucess","Login Sucessful")

                self.destroyPackWidget(Login.main_Root)

                frmQuestion = QuestionDigonosis(Login.main_Root)

                frmQuestion.pack()

            else:

                messagebox.showinfo("Failure", "Login Details are
wrong try again")

        else:

            messagebox.showinfo("Failure", "User not found try
from another user\n or sign up for new user")

class SignUp(Frame):

    main_Root=None

    def destroyPackWidget(self,parent):

        for e in parent.pack_slaves():

            e.destroy()

    def __init__(self, master=None):

        SignUp.main_Root=master

        master.title("Register")
        super().__init__(master=master)
        master.title("Register")
        master.geometry("300x250")
        self.createWidget()
    def createWidget(self):
        self.lblMsg=Label(self, text="Please enter details
below", bg="blue")
        self.lblMsg.pack()
        self.username_lable = Label(self, text="Username * ")
        self.username_lable.pack()
        self.username = StringVar()
        self.username_entry = Entry(self,
textvariable=self.username)
        self.username_entry.pack()

        self.password_lable = Label(self, text="Password * ")
        self.password_lable.pack()
        self.password = StringVar()
        self.password_entry = Entry(self,
textvariable=self.password, show='*')
        self.password_entry.pack()
        self.btnRegister=Button(self, text="Register", width=10,
height=1, bg="blue", command=self.register_user)
        self.btnRegister.pack()
    def register_user(self):
#        print(self.username.get())
#        print("Hello")
```

```
        file = open(self.username_entry.get(), "w")
        file.write(self.username_entry.get() + "\n")
        file.write(self.password_entry.get())
        file.close()
        self.destroyPackWidget(SignUp.main_Root)
        self.lblSucess=Label(root, text="Registration Success",
fg="green", font=("calibri", 11))
        self.lblSucess.pack()
        self.btnSucess=Button(root, text="Click Here to proceed",
command=self.btnSucess_Click)
        self.btnSucess.pack()
    def btnSucess_Click(self):


        self.destroyPackWidget(SignUp.main_Root)
        frmQuestion = QuestionDigonosis(SignUp.main_Root)


        frmQuestion.pack()


root = Tk()


frmMainForm=MainForm(root)
frmMainForm.pack()
root.mainloop()
```

CHAPTER 8: RESULTS

8.1 login window

When someone Run this window application, this page will be open first. Then if user have account then they will login otherwise they will first have to register.

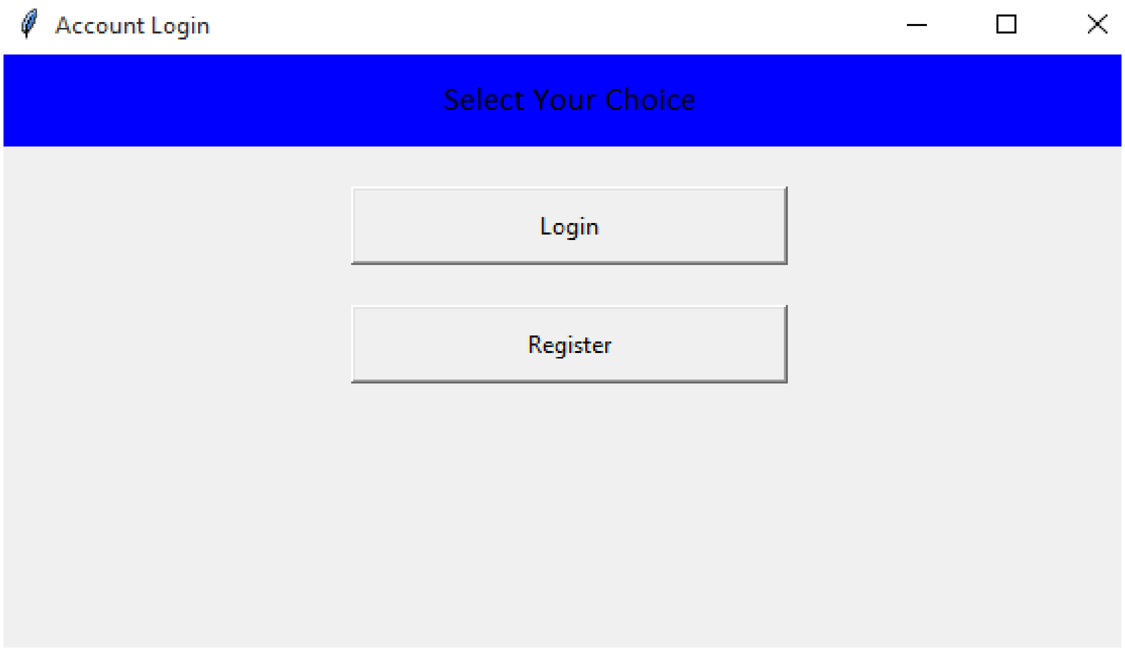


Fig 8.1: login window

8.2 Registration window

To create an account, they will have to give an unique user name and solid password.

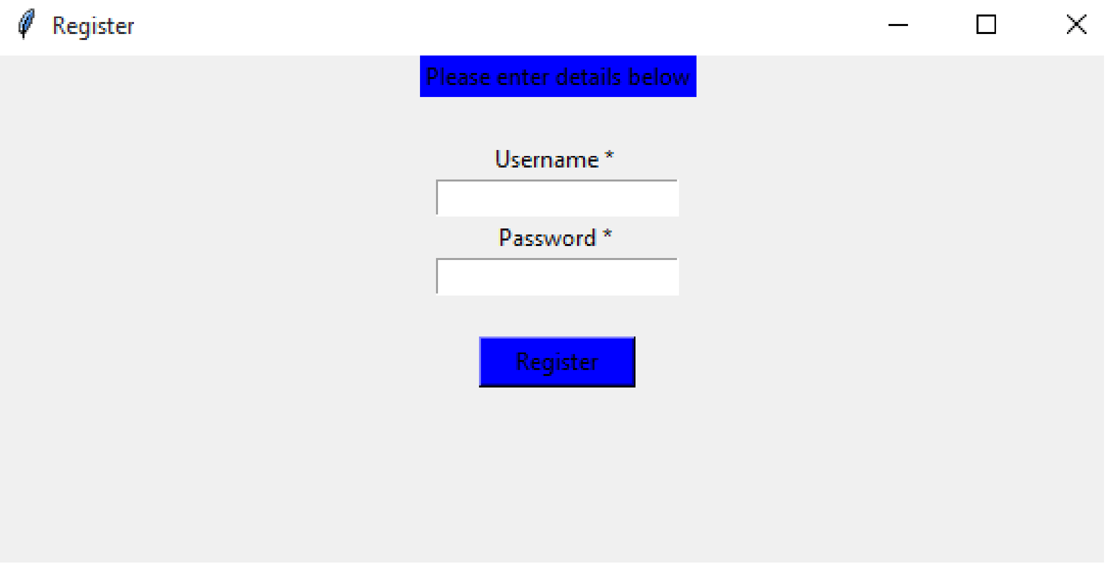
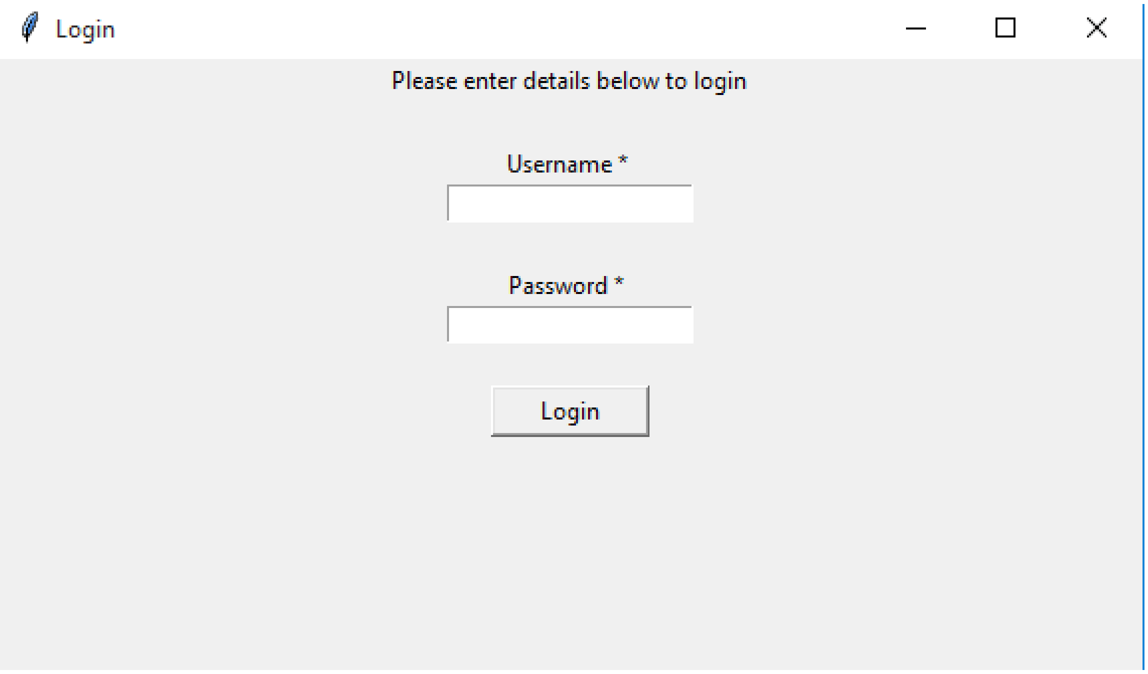


Fig 8.2: Registration window

8.3 login window

If user has already an account then they can give its username and password to this window and can move to next phase.

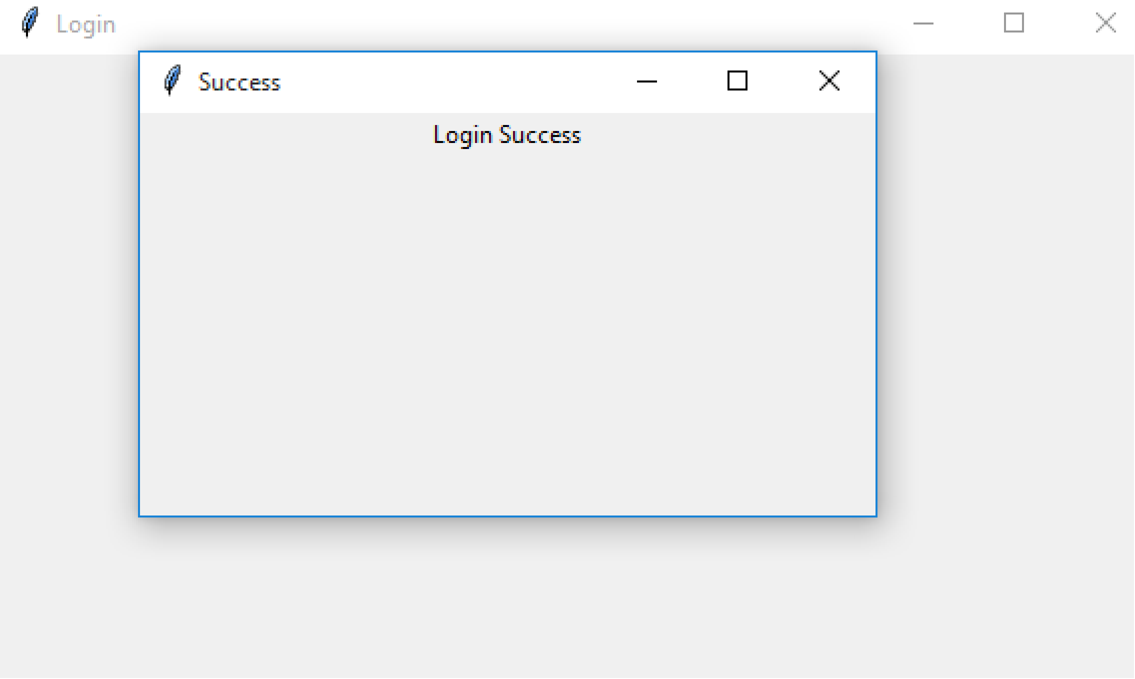


Please enter details below to login

Fig 8.3: login window

8.4 login Succesful

When we give an username and password correct then other window will open to tell that login will be successfully happen.



Login Success

Fig 8.4 login successful window

8.5 Diagnosis Window

After registration or login, when we have an account then we can easily visit to this window. Then one can start easily by clicking on START button.

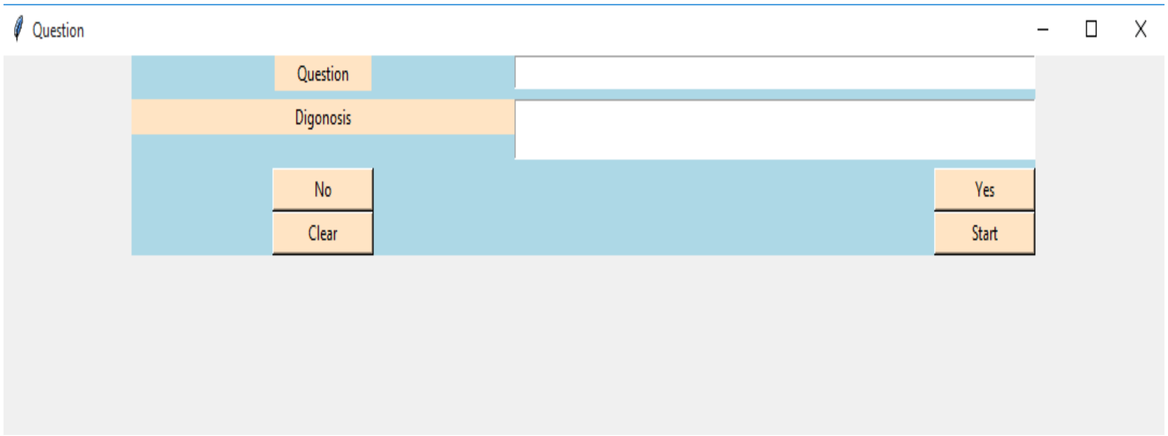
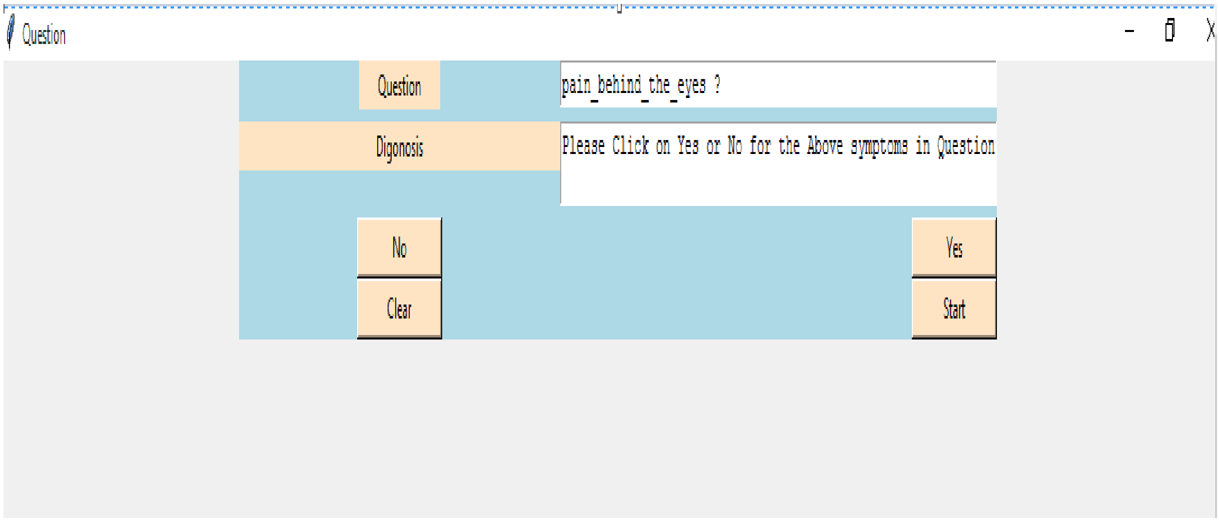


Fig 8.5: Diagnosis window

After clicking on start button, then we can see in our screen some type of Question,which is called as Symtoms of an patient.

They will have to just click on button that is Yes or No.



pain_behind_the_eyes ?

Please Click on Yes or No for the Above symptoms in Question

Fig 8.6: Diagnosis window with entries

8.6 Clear Window

It will clear all the text fields in the diagnosis window.

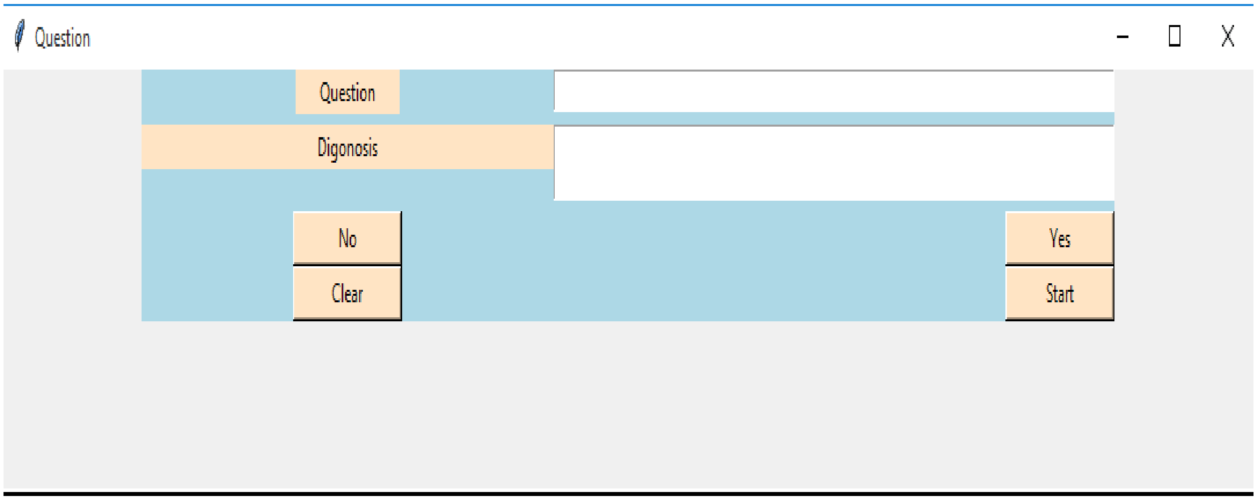
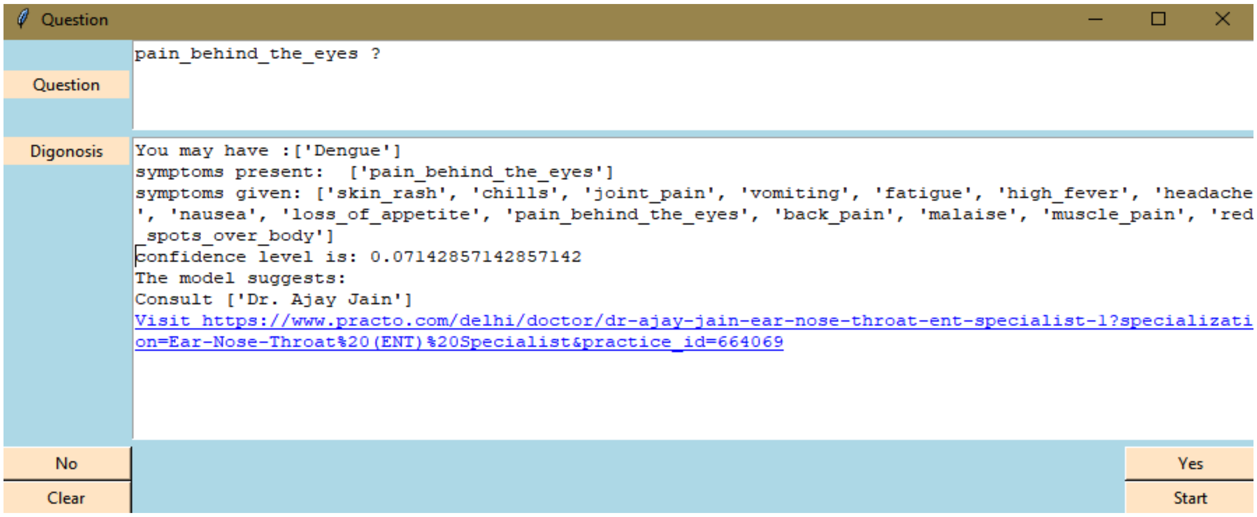


Fig 8.7: Clear window

8.7 Diagnosis Window provides link

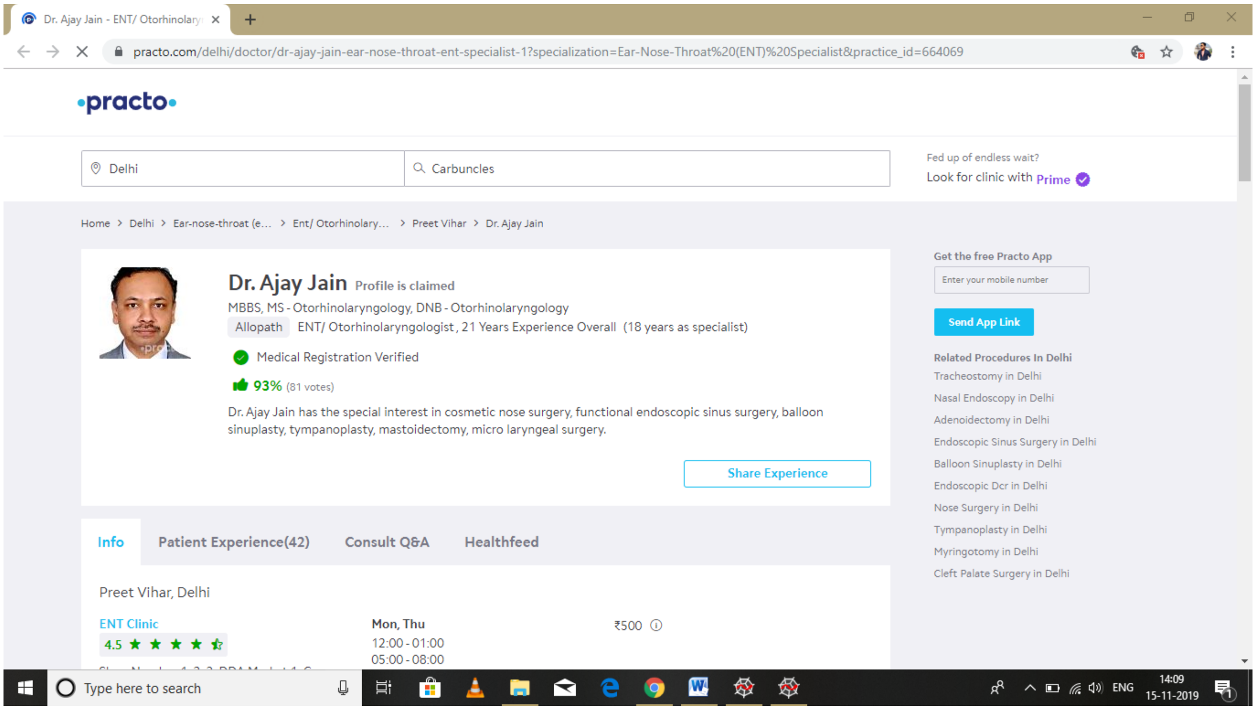
When we reply yes for any symptom then this will provide a link to the doctor and diseases which may present.



```
pain_behind_the_eyes ?
```

```
You may have :['Dengue']
symptoms present:  ['pain_behind_the_eyes']
symptoms given: ['skin_rash', 'chills', 'joint_pain', 'vomiting', 'fatigue', 'high_fever', 'headache
', 'nausea', 'loss_of_appetite', 'pain_behind_the_eyes', 'back_pain', 'malaise', 'muscle_pain', 'red
_spots_over_body']
confidence level is: 0.07142857142857142
The model suggests:
Consult ['Dr. Ajay Jain']
Visit https://www.practo.com/delhi/doctor/dr-ajay-jain-ear-nose-throat-ent-specialist-1?specializati
on=Ear-Nose-Throat%20(ENT)%20Specialist&practice_id=664069
```

Fig 8.8: Diagnosis window result



practo.com/delhi/doctor/dr-ajay-jain-ear-nose-throat-ent-specialist-1?specialization=Ear-Nose-Throat%20(ENT)%20Specialist&practice_id=664069

Dr. Ajay Jain Profile is claimed

MBBS, MS - Otorhinolaryngology, DNB - Otorhinolaryngology

Allopath ENT/ Otorhinolaryngologist , 21 Years Experience Overall (18 years as specialist)

Medical Registration Verified

93% (81 votes)

Dr. Ajay Jain has the special interest in cosmetic nose surgery, functional endoscopic sinus surgery, balloon sinuplasty, tympanoplasty, mastoidectomy, micro laryngeal surgery.

Preet Vihar, Delhi

ENT Clinic 4.5 ★ ★ ★ ★ ★	Mon, Thu 12:00 - 01:00 05:00 - 08:00	₹500

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- Myringotomy in Delhi
- Cleft Palate Surgery in Delhi

Fig 8.9: link provided by Diagnosis window

CHAPTER 9: CONCLUSION

The purpose of this project to provide admin has to collect the patients medical history of records and filter it appropriately by applying data preprocessing techniques. Once the data comes into the structured shape it can then be fed into the relational database structure of MS Excel file. The admin also needs to monitor the predictions and replies of the model to ascertain quality. Admin’s functionalities are to Collecting the appropriate medical records of the patients, handle missing values, handling categorical values,Creating sparse matrix representation, Feeding data to the autonomous pipeline for predictions, selecting and training an appropriate machine learning algorithm.VISITOR can perform the basic task of visitor is to access the chat bot from the front end and reply to its queries with a binary response (Yes/No). The visitor will be shown a confidence interval related to a certain prognosis which needs to be further investigated and experimented with for better results. The visitor can also contribute with the help of the admin to add new symptoms and diagnosis records to the database of medical history.

The window application purpose is to allow these clients an easy medium in which to check their health issues and provide best doctor according to their symtoms.

The first step is to start their procedure, then one by one all the symtoms come in clients screen. They will have to reply with yes or no answer.

Once a problem will found then they will have to click yes, then patient can see their problem in screen.

The Best Part is that it will provide doctor’s information like Doctor name and his/her website link. So that one can easily find their doctor with don’t face any type of problem, and start their treatment.This will prepare with the help of chatbot so that one can even check their problem at any time.You have to just reply with clicking of button Yes or No.

CHAPTER10: REFERENCES

Books:-

- Learn PYTHON the HARD WAY(Third Edition)
- Introduction to Machine Learning
- Machine Learning with Python Cookbook

Website:

- www.we3schools.com
- www.stackoverflow.com
- www.it-ebooks.com