A Project Report

on

Disease Prediction Using Machine Learning (Health Buddy)

Submitted in partial fulfillment of the

requirement for the award of the degree of

Bachelor of Technology in Computer Science and Engineering

Under The Supervision of
Dr. Raju Ranjan
Professor

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INDIA
December , 2021

SCHOOL OF COMPUTING SCIENCE AND ENGINEERING
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CANDIDATE'S DECLARATION

We hereby certify that the work which is being presented in the project, entitled **"Health Buddy"** in partial fulfillment of the requirements for the award of the Bachelor of Technology submitted in the School of Computing Science and Engineering of Galgotias University, Greater Noida, is an original work carried out during the period of 6 months, under the supervision of **Dr. Raju Ranjan- Professor**, Department of Computer Science and Engineering, Galgotias University, Greater Noida

The matter presented in the project has not been submitted by us for the award of any other degree of this or any other places.

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This is to certify that the above statement made by the candidates is correct to the best of my knowledge.

Dr. Raju Ranjan
Professor

CERTIFICATE

The Final Project Viva-Voce examination of Adarsh Tripathi, 18SCSE1010415 and Adarsh Kumar Pandey 19SCSE1010789 has been held on _____ and his/her work is recommended for the award of Bachelor of Technology.

Signature of Examiner(s) **Signature of Supervisor(s)**

Signature of Project Coordinator **Signature of Dean**

Date: December, 2021

Place: Greater Noida

Abstract

Here’s our team present a paper on disease prediction using machine learning through an application’.The motivation behind this application is the pandemic(Covid-Situation) faced by the whole world , also to robotise the current manual framework by the assistance of mechanised supplies and undeniable PC programming, so their important information/data can be put away for a more drawn out period with simple getting to and control of something very similar.This paper introduces the field of diseases prediction , the treatment for the disease and consulting with the doctors nearby through efficient programming using machine learning . It describes the need for a system of online artificial doctor, which will not only help them in predicting and understanding the diseases , but it will also advise them of certain medicines that is necessary for controlling or curing those diseases . The entire experience of the patient will be very convenient , time saving and also low cost as compared to the offline pharmacies as entire the facility will be available for 24 hours a day . Apart from the efficiency of the service that the user will experience ,their privacy will also be maintained . Diseases prediction using machine learning , as portrayed above, can prompt blunder free, secure, solid and quick administration framework. Along these lines it will help association in better usage of assets. The association can keep up with mechanised records without repetitive sections. That implies that one need not be diverted by data that isn't applicable, while having the option to arrive at the data.

The point is to mechanise its current manual framework by the assistance of automated types of gear and undeniable PC programming, satisfying their prerequisites, so their significant disease prediction and their cure also the medicines with simple getting to and control of something similar. Fundamentally the venture depicts how to oversee for great execution and better administrations for the users.

Disease Prediction expects to help each and every individual who are intending to know their disease and get a cure for the same by consulting a doctor online , anywhere and anytime . Disease Prediction is a web application which clients can execute in their cell phones or PC’s and track and see the disease they are suffering from .As we all know

during the Covid Pandemic faced the entire human race their was shortage of doctors , medical facilities , hospitals as it was an forecasted before and all the human race were feeling helpless . Non-Covid Patients who were not suffering coronavirus but were not well due to some other diseases were unable to consult the doctors and get the desires treatment for the procured diseases . Here comes our Health Buddy which will predict the diseases. to the users and give them cure , also they can schedule an online appointment with the doctors .

Table of Contents

List of Table

List of Figures

Acronyms

B.Tech.	Bachelor of Technology
M.Tech.	Master of Technology
BCA	Bachelor of Computer Applications
MCA	Master of Computer Applications
B.Sc. (CS)	Bachelor of Science in Computer Science
M.Sc. (CS)	Master of Science in Computer Science
SCSE	School of Computing Science and Engineering

CHAPTER-1

Introduction

Extensive familiarity with computer-based technology in the healthcare industry has led to accumulation electronic data. Due to the large amount of data, medical Doctors face the challenge of analyzing symptoms accurately as well early diagnosis. However, the machine is monitored reading (ML) algorithms have shown significant potential in standard diagnostic and therapeutic procedures medical professionals in early detection of highly dangerous diseases. In these texts, the purpose of which is to identify the various styles types of ML models monitored for disease detection through performance metrics test. Most striking the discussion of ML algorithms surveyed was Na¨ıve Bayes (NB), Decision Trees (DT), Nearby K Neighborhood (KNN). As a result, Support Vector Machine (SVM) is the most adequate acquisition kidney disease and Parkinson's disease. Logistic Regression (LR) plays a key role in predicting heart disease. Finally, Random Forest (RF), and Convolutional Neural Networks (CNN) accurate prediction of asthma and general illnesses, respectively.

Due to the advancement of data in biomedical and healthcare communities, accurate research of medical data benefits early diagnosis, patient care, and community services. When the quality of medical data incomplete research accuracy decreases. In addition, different regions exhibit a unique appearance of certain regional diseases, which may weaken the prognosis for disease outbreaks.

The proposed system provides machine learning algorithms for the effective prediction of various diseases that happens in communities that are often sick. Examines modified models that are more than just real-life hospital data collected. To overcome the complexity of incomplete data, it uses the hidden feature model to resize the file missing data. It diagnoses chronic regional cerebral infarction. Scheduled use once random data from the hospital using the Machine Learning Machine Decision and Reduction Map algorithm. With our best knowledge in the area of medical data analysis, there is no work available focuses on both types of data.

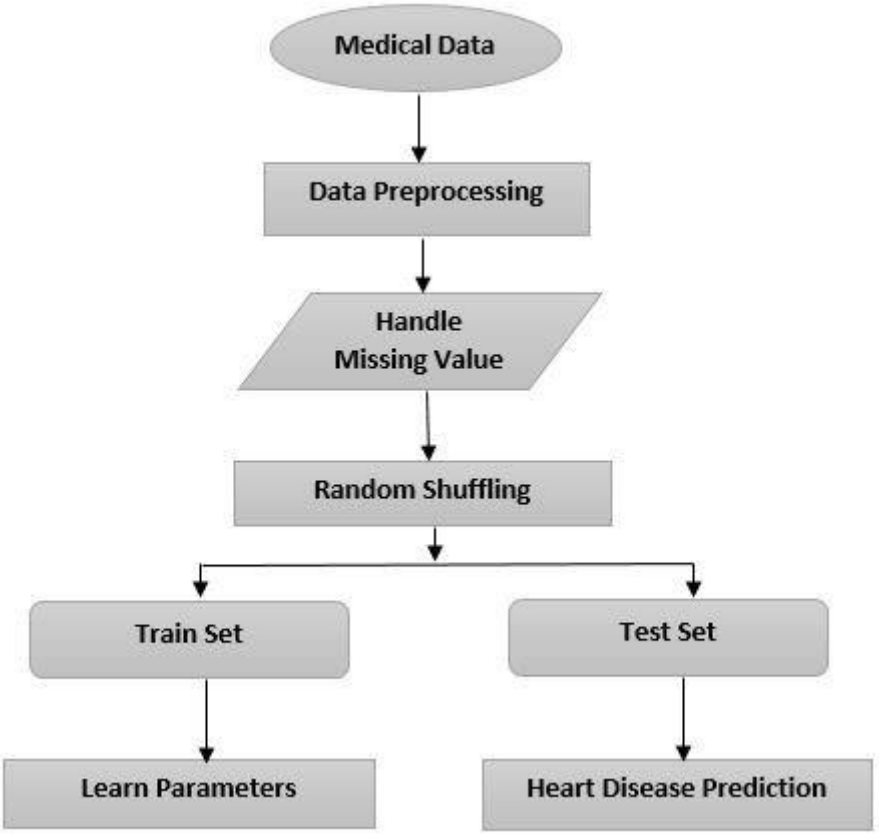
Literature Reviews/Comparative Study

Disease prediction exploitation Machine Learning over massive Data". the massive information is quickest conception in current trend, therefore this idea is applied in additional fields. the {large|the massive} information is most generally utilised in every each field as a result of it's terribly large. the massive information is applied in medical field each facet developing the higher growth in each fields, that's massive information is applied in medical fields develops the medical fields at an equivalent time increase the expansion in massive information field. the massive information helps to realise the higher growth in medical and health care sectors. It to boot, provides the additional deserves offers, (i) medical information analysis with accuracy, (ii) early prediction for illness, (iii) patient familiarised information with accuracy, (iv) The medical information, is firmly hold on and utilised in several places, (v) incomplete regional information are reduced and provides the accuracy result. Goal of the conception is select the region and collects the hospital information or medical information of specific elite region, this method is exploitation the machine learning formula. This term supported the information mining technique is employed for illness prediction with accuracy.

In the paper "A study on data processing prediction techniques in aid sector" [2] the fields that mentioned square measure, info Discovery methodology (KDD) is that the strategy of adjusting the low-level knowledge into high-level information. Hence, KDD refers to the nontrivial removal of implicit, previously unknown and likely useful knowledge from info in databases. The iterative methodology consists of the next steps: info cleansing, info integration, info alternative, info transformation, processing, Pattern analysis, Knowledge. aid processing prediction supported processing techniques square measure as follows: Neural network, Bayesian Classifiers, call tree, Support Vector Machine. The paper states the comparative study off varied aid predictions, Study of data mining techniques and tools for prediction of disorder, varied cancers, and polygenic disorder, illness and medication conditions. Few limitations square measure that if attributes aren't connected then call trees prediction is a smaller amount correct and ANN is computationally intensive to coach conjointly it doesn't cause specific

conclusion.

Disease Prediction Using Machine Learning



Fungal infections-

Fungal infections can affect anyone, and they can appear on several parts of the body. A jock with athlete's foot, a baby with thrush, and a woman with a vaginal yeast infection are just a few examples.

Fungi are microorganisms characterized by a substance in their cell walls called chitin. Some fungi, like many types of mushrooms, are edible. Other types of fungi, like aspergillus, can be extremely dangerous and lead to life-threatening diseases.

Different types of fungi can cause fungal infections. In some cases, fungi that aren't typically found on or inside your body can colonize it and cause an infection. In other cases, fungi that are normally present on or inside your body can multiply out of control and cause an infection.

Fungal infections can be contagious. They can spread from one person to another. In

some cases, you can also catch disease-causing fungi from infected animals or contaminated soil or surfaces.

If you develop signs or symptoms of a fungal infection, make an appointment with your doctor.

Allergies-

An allergy is a reaction by your immune system to something that does not bother most other people. People who have allergies often are sensitive to more than one thing. Substances that often cause reactions are:

Pollen
Dust mites
Mold spores
Pet dander
Food
Insect stings
Medicines

Normally, your immune system fights germs. It is your body's defense system. In most allergic reactions, however, it is responding to a false alarm. Genes and the environment probably both play a role.

Allergies can cause a variety of symptoms such as a runny nose, sneezing, itching, rashes, swelling, or asthma. Allergies can range from minor to severe. Anaphylaxis is a severe reaction that can be life-threatening. Doctors use skin and blood tests to diagnose allergies. Treatments include medicines, allergy shots, and avoiding the substances that cause the reactions.

Chronic cholestatic diseases

Chronic cholestatic diseases, whether occurring in infancy, childhood or adulthood, are characterized by defective bile acid transport from the liver to the intestine, which is caused by primary damage to the biliary epithelium in most cases. In this article, approaches to diagnosis and management of the main specific disorders are provided and some of the recent developments in this field are discussed. Major advances in the

understanding of the cellular and molecular physiology of bile secretion have led to identification of genetic defects responsible for the different types of progressive familial intrahepatic cholestasis (PFIC). The potential role of the genes involved in PFIC in some adult cholestatic disorders remains to be determined. The majority of adult patients with chronic cholestasis have primary biliary cirrhosis (PBC) or primary sclerosing cholangitis (PSC). Recently, variant forms of PBC have been described. The term autoimmune cholangitis is used to describe patients having chronic non-suppurative cholangitis with negative antimitochondrial antibodies (AMA) but positive antinuclear and/or antismooth muscle antibodies. Autoimmune cholangitis and AMA-positive PBC are quite similar in terms of clinical presentation, survival and response to ursodeoxycholic acid (UDCA) therapy. In contrast, autoimmune cholangitis must be distinguished from PBC-autoimmune hepatitis (AIH) overlap syndrome in which biochemical and histological characteristics of both PBC and AIH coexist. Combination of UDCA and corticosteroids is required in most patients with overlap syndrome to obtain a complete clinical and biochemical response. Long-term UDCA treatment improves survival without liver transplantation in PBC patients. Among the putative mechanisms of the beneficial effects of UDCA, description of anti-apoptotic properties and effect on endotoxin disposal in biliary cells have provided new insights. In patients with incomplete response to UDCA, combination of UDCA with antiinflammatory or immunosuppressive drugs is under evaluation. Variant forms of PSC have also been described, including PSC-AIH overlap syndrome, especially in children or young adults, and small-duct PSC, which is characterized by normal cholangiogram in patients having chronic cholestasis, histologic features compatible with PSC and inflammatory bowel disease. Development of cholangiocarcinoma (CC) is a major feature of PSC, occurring in 10-15% of patients. Early diagnosis of CC is a difficult challenge, although positron emission tomography seems a promising tool. Unlike PBC, effective medical therapy is not yet available in PSC, reflecting the lack of knowledge about the exact pathogenesis of the disease. Currently, liver transplantation is the only effective therapy for patients with advanced disease, although recurrence of PSC in the graft may occur.

Drug Reactions-

Most of the time, medicines make our lives better. They reduce aches and pains, fight infections, and control problems such as high blood pressure or diabetes. But medicines

can also cause unwanted reactions.

One problem is interactions, which may occur between:

Two drugs, such as aspirin and blood thinners
Drugs and food, such as statins and grapefruit
Drugs and supplements, such as ginkgo and blood thinners
Drugs and diseases, such as aspirin and peptic ulcers
Interactions can change the actions of one or both drugs. The drugs might not work, or you could get side effects.

Side effects are unwanted effects caused by the drugs. Most are mild, such as a stomach aches or drowsiness, and go away after you stop taking the drug. Others can be more serious.

Drug allergies are another type of reaction. They can be mild or life-threatening. Skin reactions, such as hives and rashes, are the most common type. Anaphylaxis, a serious allergic reaction, is more rare.

When you start a new prescription or over-the-counter medication, make sure you understand how to take it correctly. Know which other medications and foods you need to avoid. Ask your health care provider or pharmacist if you have questions.

Peptic ulcer disease-

Peptic ulcers are open sores that develop on the inside lining of your stomach and the upper portion of your small intestine. The most common symptom of a peptic ulcer is stomach pain.

Peptic ulcers include:

Gastric ulcers that occur on the inside of the stomach
Duodenal ulcers that occur on the inside of the upper portion of your small intestine (duodenum)

The most common causes of peptic ulcers are infection with the bacterium Helicobacter pylori (H. pylori) and long-term use of nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen (Advil, Motrin IB, others) and naproxen sodium (Aleve). Stress and spicy foods do not cause peptic ulcers. However, they can make your symptoms worse. The most common peptic ulcer symptom is burning stomach pain. Stomach acid makes the pain worse, as does having an empty stomach. The pain can often be relieved by eating certain foods that buffer stomach acid or by taking an acid-reducing medication, but then it may come back. The pain may be worse between meals and at night.

Many people with peptic ulcers don't even have symptoms.

Less often, ulcers may cause severe signs or symptoms such as:

1. Vomiting or vomiting blood — which may appear red or black
2. Dark blood in stools, or stools that are black or tarry
3. Trouble breathing
4. Feeling faint
5. Nausea or vomiting
6. Unexplained weight loss
7. Appetite changes

AIDS-

Acquired immunodeficiency syndrome (AIDS) is a chronic, potentially life-threatening condition caused by the human immunodeficiency virus (HIV). By damaging your immune system, HIV interferes with your body's ability to fight infection and disease.

HIV is a sexually transmitted infection (STI). It can also be spread by contact with infected blood or from mother to child during pregnancy, childbirth or breast-feeding. Without medication, it may take years before HIV weakens your immune system to the point that you have AIDS.

There's no cure for HIV/AIDS, but medications can dramatically slow the progression of the disease. These drugs have reduced AIDS deaths in many developed nations.

The symptoms of HIV and AIDS vary, depending on the phase of infection.

Primary infection (Acute HIV)

Some people infected by HIV develop a flu-like illness within two to four weeks after the virus enters the body. This illness, known as primary (acute) HIV infection, may last for a few weeks. Possible signs and symptoms include:

Fever
Headache
Muscle aches and joint pain
Rash
Sore throat and painful mouth sores
Swollen lymph glands, mainly on the neck
Diarrhea
Weight loss
Cough
Night sweats

These symptoms can be so mild that you might not even notice them. However, the amount of virus in your bloodstream (viral load) is quite high at this time. As a result, the infection spreads more easily during primary infection than during the next stage.

Clinical latent infection (Chronic HIV)

In this stage of infection, HIV is still present in the body and in white blood cells. However, many people may not have any symptoms or infections during this time.

This stage can last for many years if you're not receiving antiretroviral therapy (ART). Some people develop more severe disease much sooner.

Symptomatic HIV infection

As the virus continues to multiply and destroy your immune cells — the cells in your body that help fight off germs — you may develop mild infections or chronic signs and symptoms such as:

Fever
Fatigue
Swollen lymph nodes — often one of the first signs of HIV infection
Diarrhea
Weight loss
Oral yeast infection (thrush)
Shingles (herpes zoster)
Pneumonia
Progression to AIDS
Thanks to better antiviral treatments, most people with HIV in the U.S. today don't develop AIDS. Untreated, HIV typically turns into AIDS in about 8 to 10 years.

When AIDS occurs, your immune system has been severely damaged. You'll be more likely to develop opportunistic infections or opportunistic cancers — diseases that wouldn't usually cause illness in a person with a healthy immune system.

The signs and symptoms of some of these infections may include:

Sweats
Chills
Recurring fever
Chronic diarrhea
Swollen lymph glands
Persistent white spots or unusual lesions on your tongue or in your mouth
Persistent, unexplained fatigue
Weakness
Weight loss
Skin rashes or bumps

Diabetes-

Diabetes is a disease that occurs when your blood glucose, also called blood sugar, is too high. Blood glucose is your main source of energy and comes from the food you

eat. Insulin, a hormone made by the pancreas, helps glucose from food get into your cells to be used for energy. Sometimes your body doesn't make enough—or any—insulin or doesn't use insulin well. Glucose then stays in your blood and doesn't reach your cells.

Over time, having too much glucose in your blood can cause health problems. Although diabetes has no cure, you can take steps to manage your diabetes and stay healthy.

Sometimes people call diabetes "a touch of sugar" or "borderline diabetes." These terms suggest that someone doesn't really have diabetes or has a less serious case, but every case of diabetes is serious.

Diabetes monitor with fruits and vegetables

Diabetes affects just about everyone, from the over 110 million Americans with or at risk for the disease to the many more people who care for them.

What are the different types of diabetes?

The most common types of diabetes are type 1, type 2, and gestational diabetes.

Type 1 diabetes

If you have type 1 diabetes, your body does not make insulin. Your immune system attacks and destroys the cells in your pancreas that make insulin. Type 1 diabetes is usually diagnosed in children and young adults, although it can appear at any age. People with type 1 diabetes need to take insulin every day to stay alive.

Type 2 diabetes

If you have type 2 diabetes, your body does not make or use insulin well. You can develop type 2 diabetes at any age, even during childhood. However, this type of diabetes occurs most often in middle-aged and older people. Type 2 is the most common type of diabetes.

Gestational diabetes

Gestational diabetes develops in some women when they are pregnant. Most of the

time, this type of diabetes goes away after the baby is born. However, if you've had gestational diabetes, you have a greater chance of developing type 2 diabetes later in life. Sometimes diabetes diagnosed during pregnancy is actually type 2 diabetes.

Other types of diabetes
Less common types include monogenic diabetes, which is an inherited form of diabetes, and cystic fibrosis-related diabetes.

Gastroenteritis-

Viral gastroenteritis is an intestinal infection marked by watery diarrhea, abdominal cramps, nausea or vomiting, and sometimes fever.

The most common way to develop viral gastroenteritis — often called stomach flu —is through contact with an infected person or by ingesting contaminated food or water. If you're otherwise healthy, you'll likely recover without complications. But for infants, older adults and people with compromised immune systems, viral gastroenteritis can be deadly.

There's no effective treatment for viral gastroenteritis, so prevention is key. In addition to avoiding food and water that may be contaminated, thorough and frequent hand-washings are your best defense.
Although it's commonly called stomach flu, gastroenteritis isn't the same as influenza. Real flu (influenza) affects only your respiratory system — your nose, throat and lungs. Gastroenteritis, on the other hand, attacks your intestines, causing signs and symptoms, such as:

Watery, usually nonbloody diarrhea — bloody diarrhea usually means you have a different, more severe infection
Abdominal cramps and pain
Nausea, vomiting or both
Occasional muscle aches or headache
Low-grade fever
Depending on the cause, viral gastroenteritis symptoms may appear within one to three

days after you're infected and can range from mild to severe. Symptoms usually last just a day or two, but occasionally they may persist as long as 10 days.

Because the symptoms are similar, it's easy to confuse viral diarrhea with diarrhea caused by bacteria, such as Clostridium difficile, salmonella and E. coli, or parasites, such as giardia.

Bronchial Asthma-

Bronchial asthma is a medical condition which causes the airway path of the lungs to swell and narrow. Due to this swelling, the air path produces excess mucus making it hard to breathe, which results in coughing, short breath, and wheezing. The disease is chronic and interferes with daily working. The disease is curable and inhalers help overcome asthma attacks. Bronchial Asthma can affect any age or gender and depends upon environmental and hereditary factors at large. When ignored, disease proves fatal claiming lives in many cases. As per a recent survey, more than 1 million cases are reported every year in India.

The symptoms may vary from individual to individual and depends on environmental factors. A person may show regular symptoms of the disease or periodic symptoms that may prompt at a certain time. The most common signs of asthma that can help diagnose the disease are:

1. Breathlessness or short breath while talking, laughing, or running.
2. Chest Pain or tightness.
3. Sleep apnea or trouble while sleeping caused by breathlessness.
4. Coughing or wheezing (whistling sound from chest while sleeping or lying down).
5. Cold and flu due to viral infection.

Hypertension-

High blood pressure (hypertension) is a common condition in which the long-term force of the blood against your artery walls is high enough that it may eventually cause health problems, such as heart disease.

Blood pressure is determined both by the amount of blood your heart pumps and the amount of resistance to blood flow in your arteries. The more blood your heart pumps

and the narrower your arteries, the higher your blood pressure. A blood pressure reading is given in millimeters of mercury (mm Hg). It has two numbers.

Top number (systolic pressure). The first, or upper, number measures the pressure in your arteries when your heart beats.
Bottom number (diastolic pressure). The second, or lower, number measures the pressure in your arteries between beats.
You can have high blood pressure for years without any symptoms. Uncontrolled high blood pressure increases your risk of serious health problems, including heart attack and stroke. Fortunately, high blood pressure can be easily detected. And once you know you have high blood pressure, you can work with your doctor to control it.
Most people with high blood pressure have no signs or symptoms, even if blood pressure readings reach dangerously high levels.

A few people with high blood pressure may have headaches, shortness of breath or nosebleeds, but these signs and symptoms aren't specific and usually don't occur until high blood pressure has reached a severe or life-threatening stage.

Migraine-

Migraine is a medical condition that involves severe, recurring headaches and other symptoms.

A migraine episode is a type of headache. An episode usually occurs in stages and can last for several days. Severe cases can affect a person’s daily life, including their ability to work or study.

Migraine can affect people in different ways, and the triggers, severity, symptoms, and frequency can vary. Some people have more than one episode each week, while others have them only occasionally.

In 2018, researchers found that more than 15%Trusted Source of adults in the United States had experienced a migraine episode or a severe headache within the last 3 months.

Research from 2015 found that migraine affects just over 19%Trusted Source of females and 9% of males. Episodes often occur in people aged 18–44 years, but they can happen at any time, including during childhood.

Cervical spondylosis-

Cervical spondylosis is a general term for age-related wear and tear affecting the spinal disks in your neck. As the disks dehydrate and shrink, signs of osteoarthritis develop, including bony projections along the edges of bones (bone spurs).

Cervical spondylosis is very common and worsens with age. More than 85 percent of people older than age 60 are affected by cervical spondylosis.

Most people experience no symptoms from these problems. When symptoms do occur, nonsurgical treatments often are effective.

For most people, cervical spondylosis causes no symptoms. When symptoms do occur, they typically include pain and stiffness in the neck.

Sometimes, cervical spondylosis results in a narrowing of the space needed by the spinal cord and the nerve roots that pass through the spine to the rest of your body. If the spinal cord or nerve roots become pinched, you might experience:

1. Tingling, numbness and weakness in your arms, hands, legs or feet
2. Lack of coordination and difficulty walking
3. Loss of bladder or bowel control

Jaundice-

Jaundice causes your skin and the whites of your eyes to turn yellow. Too much bilirubin causes jaundice. Bilirubin is a yellow chemical in hemoglobin, the substance that carries oxygen in your red blood cells. As red blood cells break down, your body builds new cells to replace them. The old ones are processed by the liver. If the liver cannot handle the blood cells as they break down, bilirubin builds up in the body and your skin may look yellow.

Many healthy babies have some jaundice during the first week of life. It usually goes away. However, jaundice can happen at any age and may be a sign of a problem. Jaundice can happen for many reasons, such as:

Blood diseases
Genetic syndromes
Liver diseases, such as hepatitis or cirrhosis
Blockage of bile ducts
Infections
Medicines

Malaria-

Malaria is a disease caused by a parasite. The parasite is spread to humans through the bites of infected mosquitoes. People who have malaria usually feel very sick with a high fever and shaking chills.

While the disease is uncommon in temperate climates, malaria is still common in tropical and subtropical countries. Each year nearly 290 million people are infected with malaria, and more than 400,000 people die of the disease.

To reduce malaria infections, world health programs distribute preventive drugs and insecticide-treated bed nets to protect people from mosquito bites. The World Health Organization has recommended a malaria vaccine for use in children who live in countries with high numbers of malaria cases.

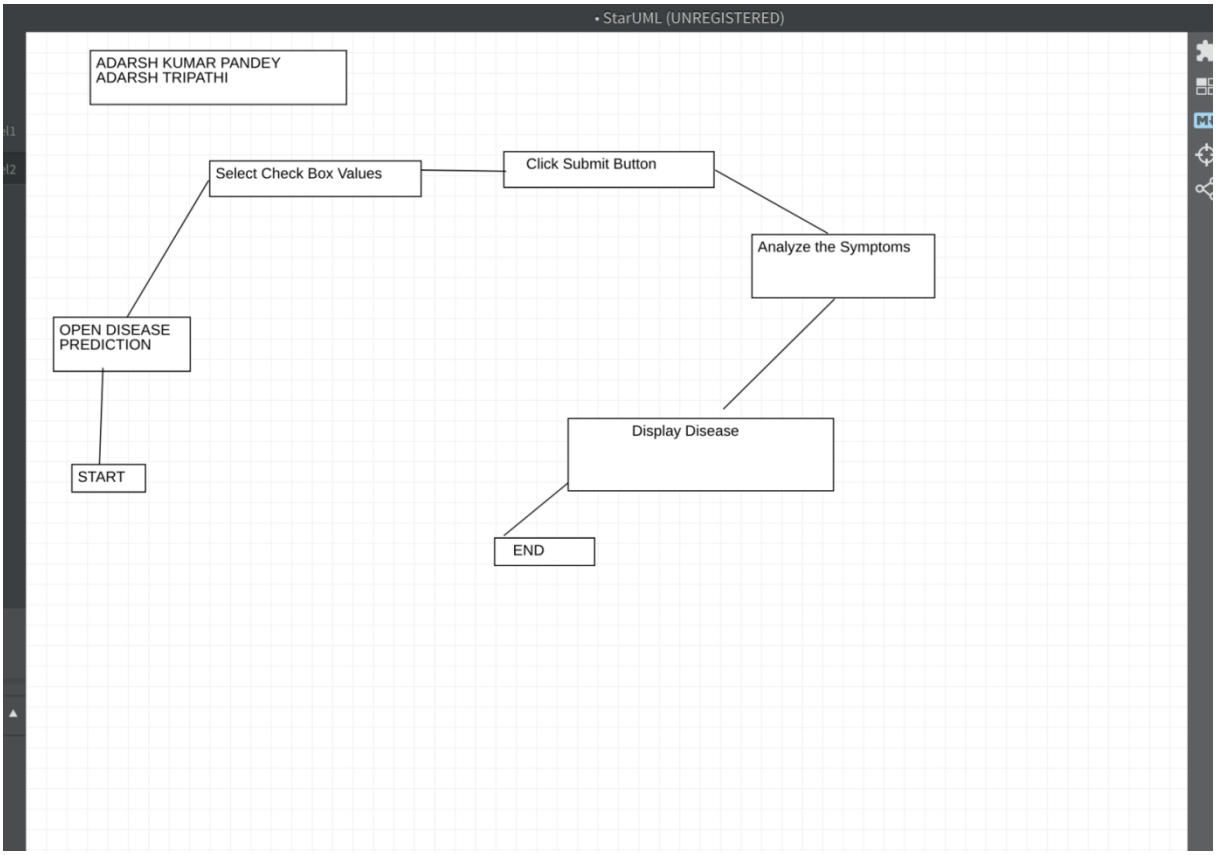
Protective clothing, bed nets and insecticides can protect you while traveling. You also can take preventive medicine before, during and after a trip to a high-risk area. Many malaria parasites have developed resistance to common drugs used to treat the disease.

Problem Formulation

In existing world, If a human is suffering from a diseases he needs a consultation from doctors also many diagnosis for knowing the diseases . Our application which is inspired by machine learning checks several parameters and all the difficulties faced by the patient and thus gives us a thorough result of the disease which is then prescribed by the medicine moreover if a patient needs a consultation with the doctor the application will provide that facility also . Several health tracking devices and sensor are available in the market by which we can easily check our blood sugar levels , pulse and bloop pressure , oxygen level . We are trying to implement this in our application to get better result and accurate health condition of the patient and thus providing a better medical treatment and the patient can rely on this upcoming technologies and adapt it easily .

To lessen manual availability , we propose an web application which is created by Python using machine learning . This application permits users to mark their difficulties and then generate three diseases which they are suffering from.

Fig 1. State Diagram

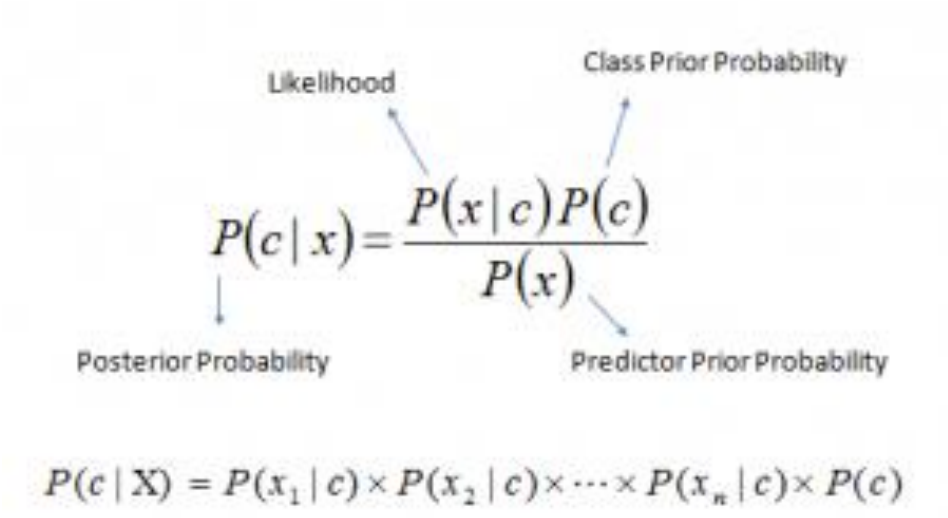


Modules Used

- **Naive Bayes Algorithm**

The Naive Bayes algorithm is an algorithm that learns the possibilities of an object with specific elements of a particular group / class. For example, if you are trying to identify a fruit according to its colour, texture and taste, then the fruit is orange, round, and soft and almost orange. All of these individual structures contribute to the potential for this fruit to be orange which is why it is known as “negligence”. As for the “Bayes” section, it refers to mathematician and philosopher Thomas Bayes and the theory named after him, the Bayes theory, which is the basis of the Naïve Bayes Algorithm. Officially, Bayes' Theorem is described as the following equation:

P(A/B) = (P(B/A)*P(A)) / P(B)



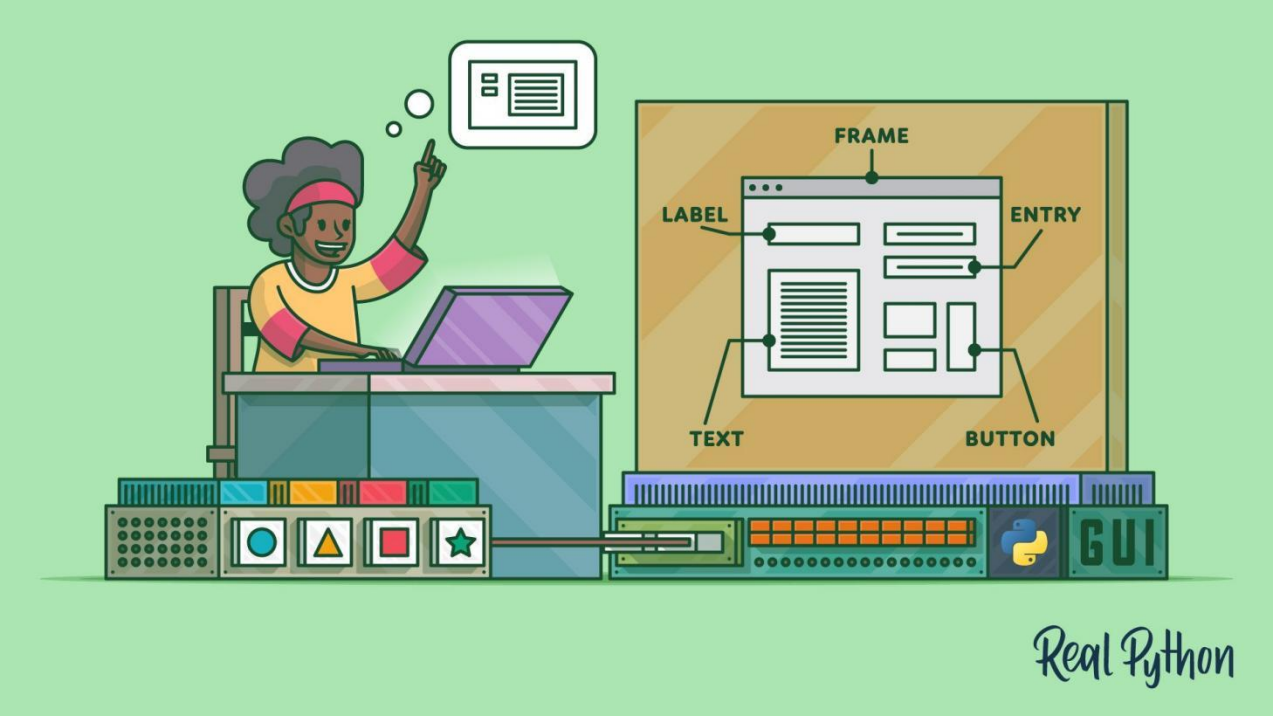
- **tKinter**

Python offers many options for improving GUI (Graphical User Interface). Of all the GUI methods which are available,the tkinter method is the most widely used method. It is a traditional Python interface for the Tk GUI toolkit which is implied

through Python. Python along with tkinter is a very fast and easy way to create GUI applications. Creating a GUI using the tkinter method is an easy task.
For creating a tkinter app:
1.Importing module - tkinter
2.Create a large window (container)
3.Add any number of widgets in the main window
4.Use Event trigger in widgets.
5.Importing tkinter is the same as importing any other module into Python code. The method name in Python 2.x is given as ‘Tkinter’ and in Python 3.x it is given as ‘tkinter’.

The scanner also provides access to the geometric configuration of widgets that can edit widgets in the parent windows. In particular there are three classes of geometry manager.

1.pack () method: Arrange widgets in blocks before placing the parent widget.
2.grid () method: Arrange the widgets in the grid (a table-like structure) before installing the parent widget.
3.Place () method: Edits widgets by placing them in specific places directed by the editor.



- **Numpy**

NumPy is a standard purpose-packed package. Provides advanced multidimensional object functionality, as well as tools for working with these programs.It is a basic computer science package with Python. It contains a variety of features, including the following:

1.Something as powerful as N-dimensional

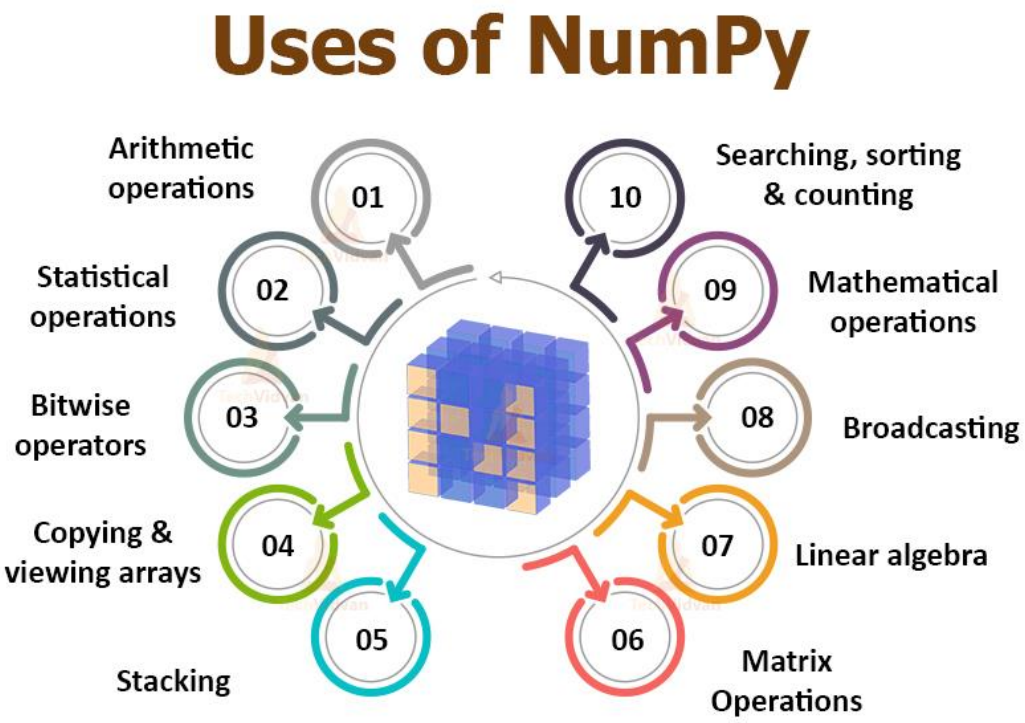
2.High quality (broadcast) services.

3.Tools for combining C / C ++ and Fortran code

4.Useful line algebra, Fourier transform, and random number power

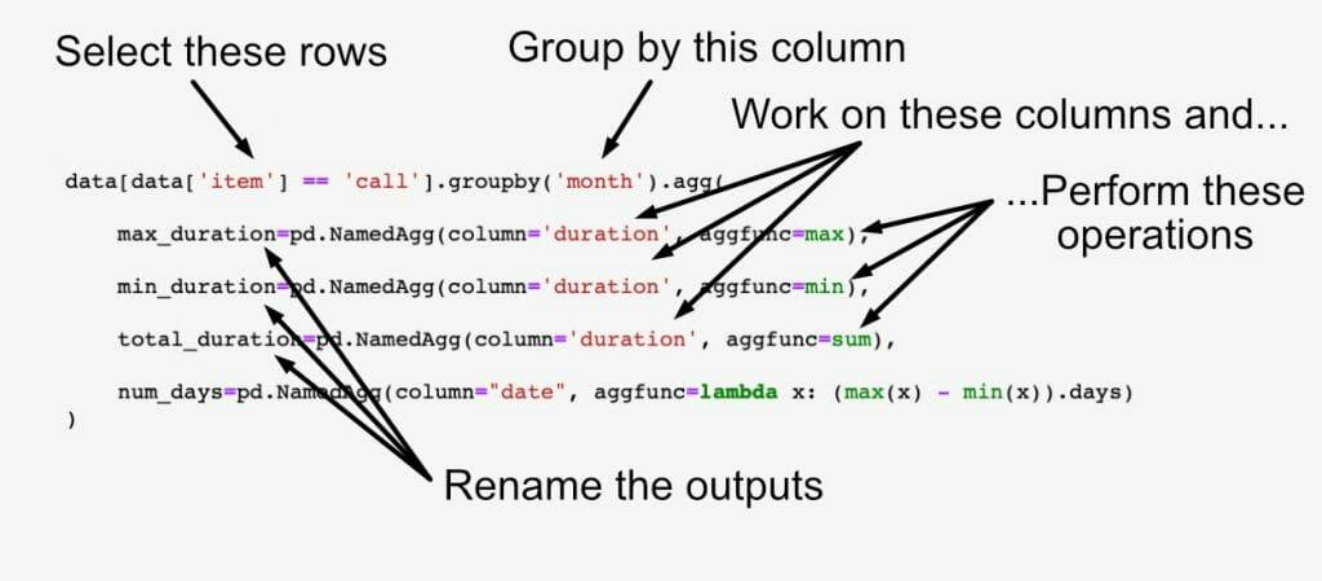
In addition to its obvious scientific uses, NumPy can also be used as an efficient multi-dimensional data container for standard data.

Incorrect data types can be defined using Numpy which allows NumPy to integrate seamlessly and quickly with a variety of information.



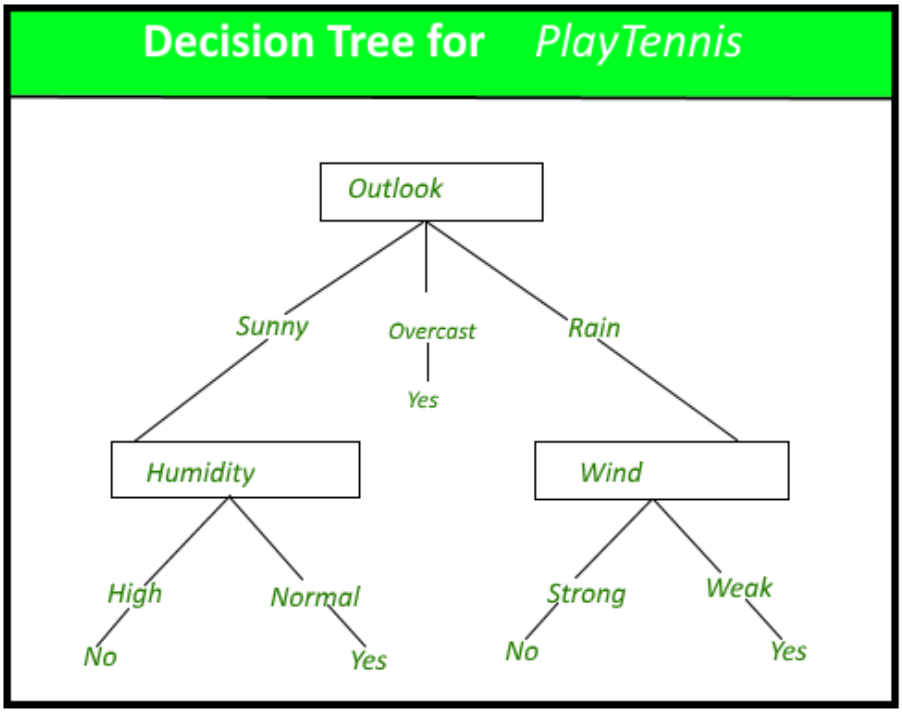
- **Pandas**

Pandas is an open source source based on NumPy library. It is a Python package that offers a variety of data structures and functionality to manipulate numerical data and time series. It is very popular for importing and analyzing data very easily. Pandas is fast and has high performance and productivity for users.
Pandas is an open source, BSD-licensed Python library that provides easy-to-use, easy-to-use data formats and Python programming language data analysis tools. Python with Pandas is used in a variety of fields including educational and commercial domains including finance, economics, mathematics, mathematics, etc.



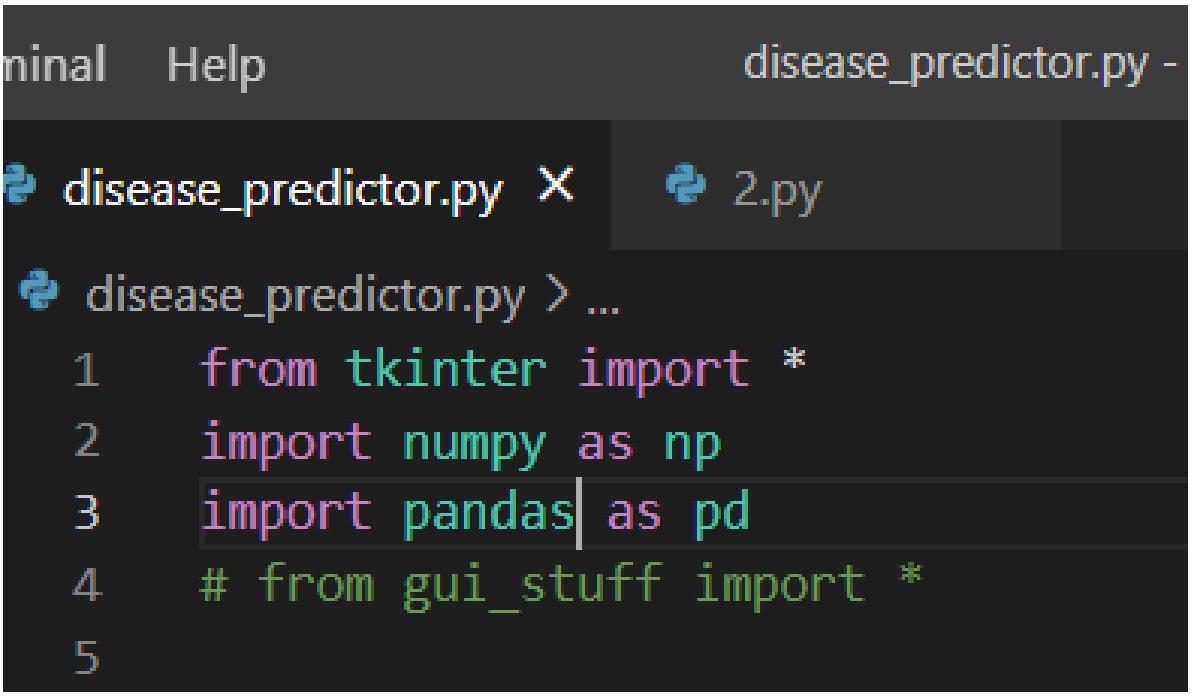
- **Decision Tree:**

The decision tree is a powerful and popular tool for dividing and predicting. A Decision tree is a flow chart similar to a tree structure, where each internal node refers to a test in the process, while each branch denotes the test result and each leaf node (end node) holds a class label.

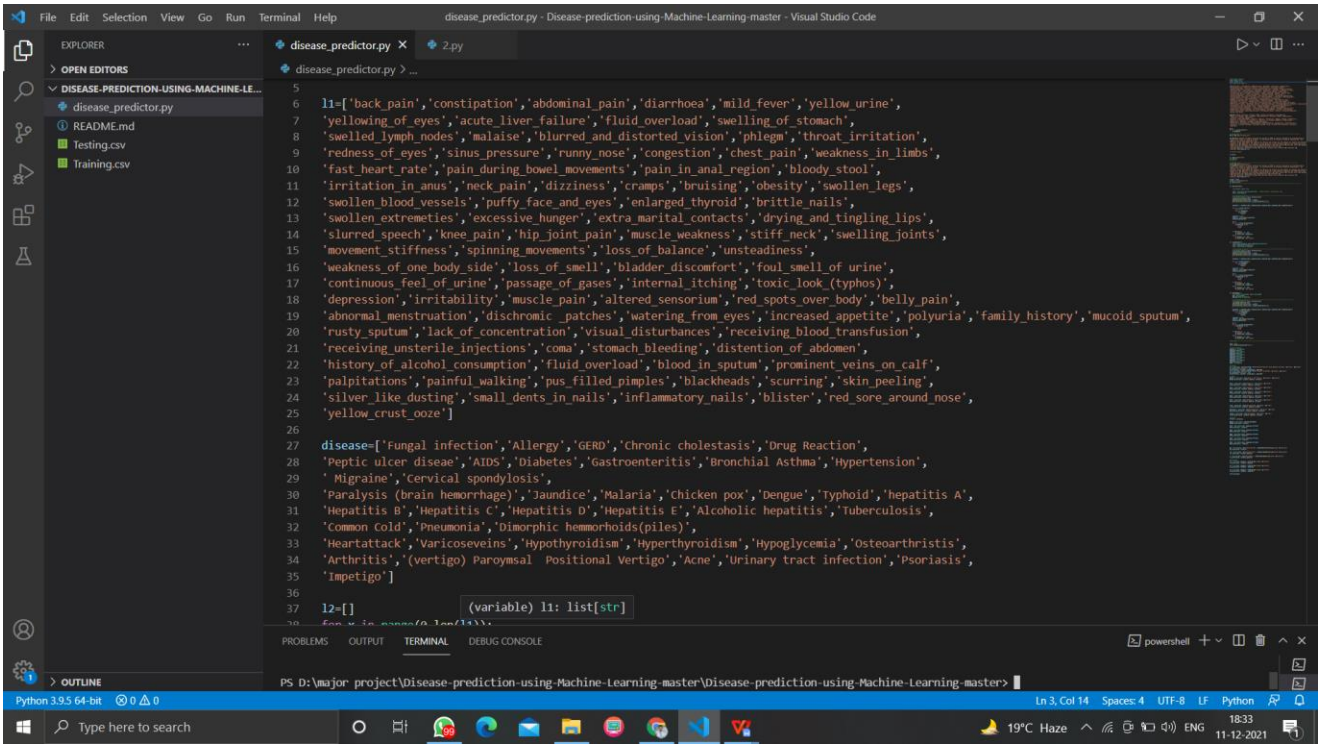


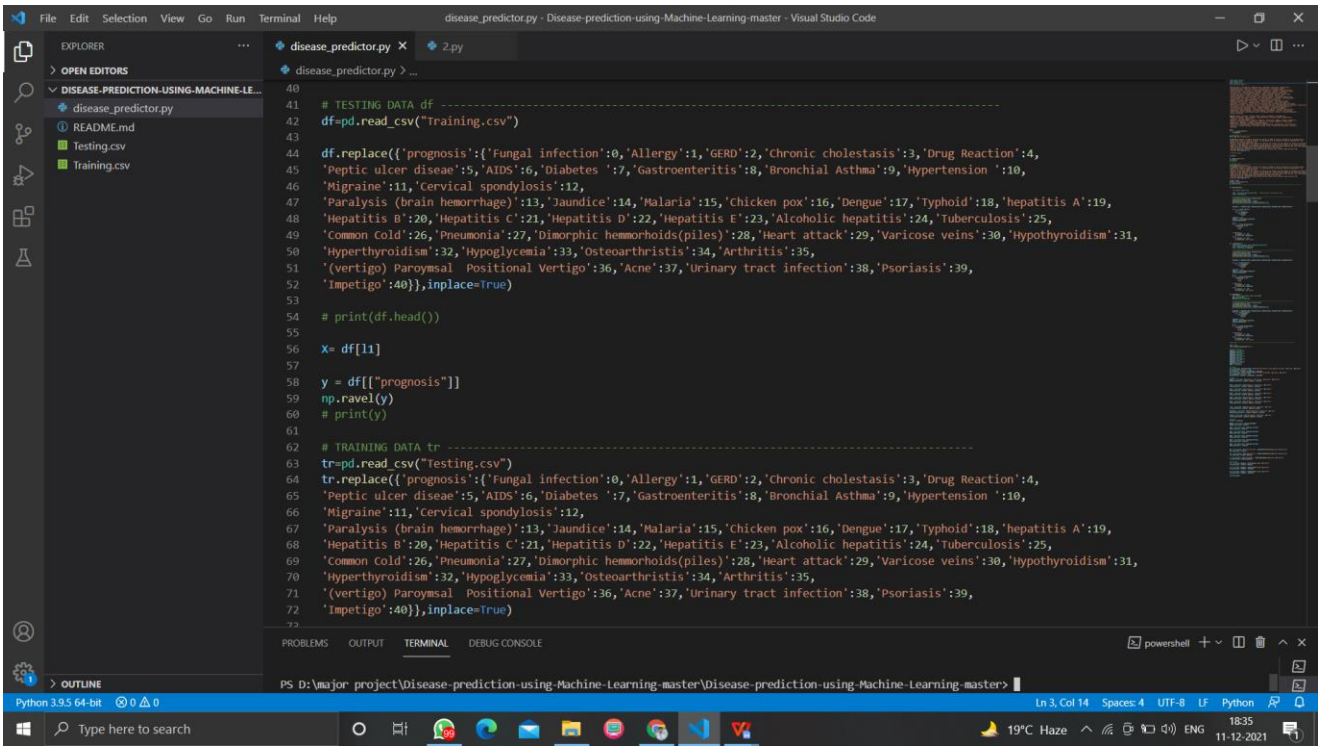
Screenshots-

Importing of Modules-



Other screenshots of code-




File Edit Selection View Go Run Terminal Help
disease_predictor.py - Disease-prediction-using-Machine-Learning-master - Visual Studio Code
EXPLORER
OPEN EDITORS
DISEASE-PREDICTION-USING-MACHINE-LE...
disease_predictor.py
README.md
Testing.csv
Training.csv
OUTLINE
disease_predictor.py
2.py
disease_predictor.py > ...
# TESTING DATA df
df=pd.read_csv("Training.csv")
df.replace({'prognosis':{'Fungal infection':0,'Allergy':1,'GERD':2,'Chronic cholestasis':3,'Drug Reaction':4,
'Peptic ulcer diseae':5,'AIDS':6,'Diabetes ':7,'Gastroenteritis':8,'Bronchial Asthma':9,'Hypertension ':10,
'Migraine':11,'Cervical spondylosis':12,
'Paralysis (brain hemorrhage)':13,'Jaundice':14,'Malaria':15,'Chicken pox':16,'Dengue':17,'Typhoid':18,'hepatitis A':19,
'Hepatitis B':20,'Hepatitis C':21,'Hepatitis D':22,'Hepatitis E':23,'Alcoholic hepatitis':24,'Tuberculosis':25,
'Common Cold':26,'Pneumonia':27,'Dimorphic hemmorhoids(piles)':28,'Heart attack':29,'Varicose veins':30,'Hypothyroidism':31,
'Hyperthyroidism':32,'Hypoglycemia':33,'Osteoarthristis':34,'Arthritis':35,
'(vertigo) Paroymsal Positional Vertigo':36,'Acne':37,'Urinary tract infection':38,'Psoriasis':39,
'Impetigo':40}},inplace=True)
# print(df.head())
X= df[l1]
y = df[["prognosis"]]
np.ravel(y)
# print(y)
# TRAINING DATA tr
tr=pd.read_csv("Testing.csv")
tr.replace({'prognosis':{'Fungal infection':0,'Allergy':1,'GERD':2,'Chronic cholestasis':3,'Drug Reaction':4,
'Peptic ulcer diseae':5,'AIDS':6,'Diabetes ':7,'Gastroenteritis':8,'Bronchial Asthma':9,'Hypertension ':10,
'Migraine':11,'Cervical spondylosis':12,
'Paralysis (brain hemorrhage)':13,'Jaundice':14,'Malaria':15,'Chicken pox':16,'Dengue':17,'Typhoid':18,'hepatitis A':19,
'Hepatitis B':20,'Hepatitis C':21,'Hepatitis D':22,'Hepatitis E':23,'Alcoholic hepatitis':24,'Tuberculosis':25,
'Common Cold':26,'Pneumonia':27,'Dimorphic hemmorhoids(piles)':28,'Heart attack':29,'Varicose veins':30,'Hypothyroidism':31,
'Hyperthyroidism':32,'Hypoglycemia':33,'Osteoarthristis':34,'Arthritis':35,
'(vertigo) Paroymsal Positional Vertigo':36,'Acne':37,'Urinary tract infection':38,'Psoriasis':39,
'Impetigo':40}},inplace=True)
PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
powershell
PS D:\major project\Disease-prediction-using-Machine-Learning-master\Disease-prediction-using-Machine-Learning-master>
Python 3.9.5 64-bit
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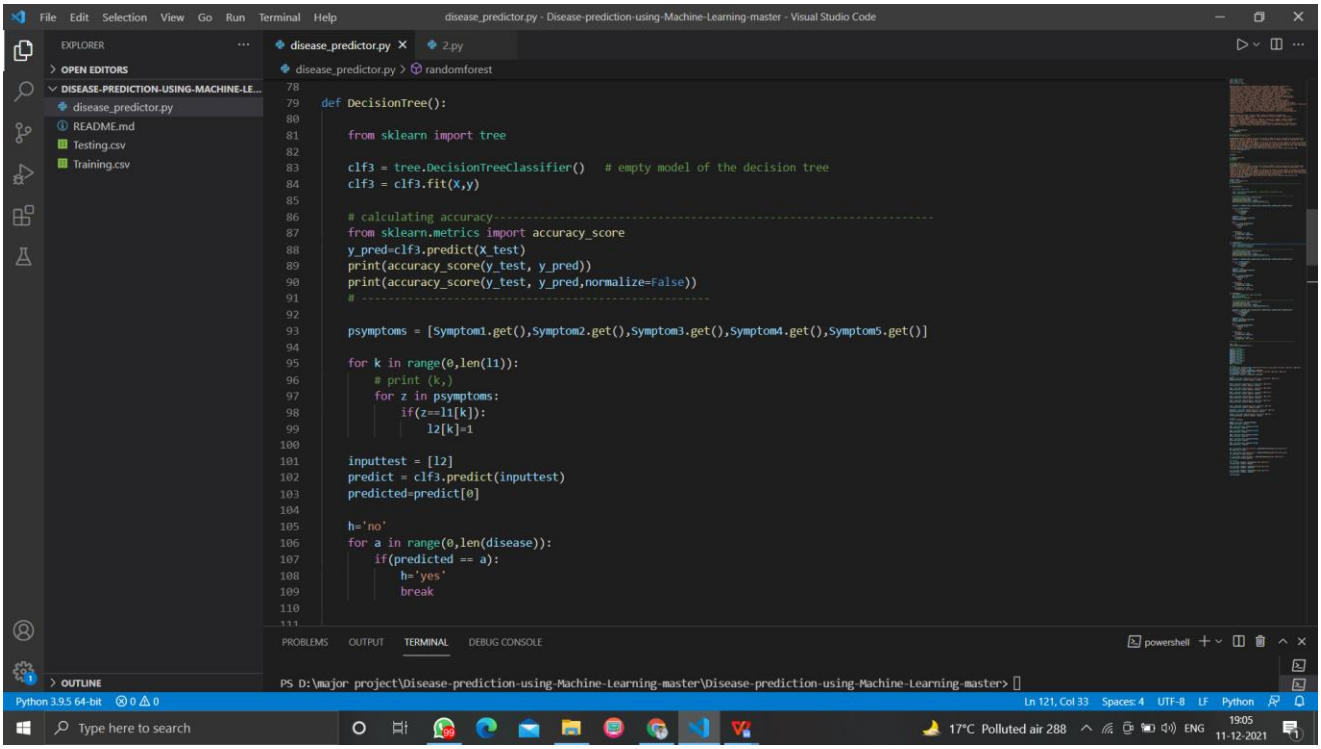
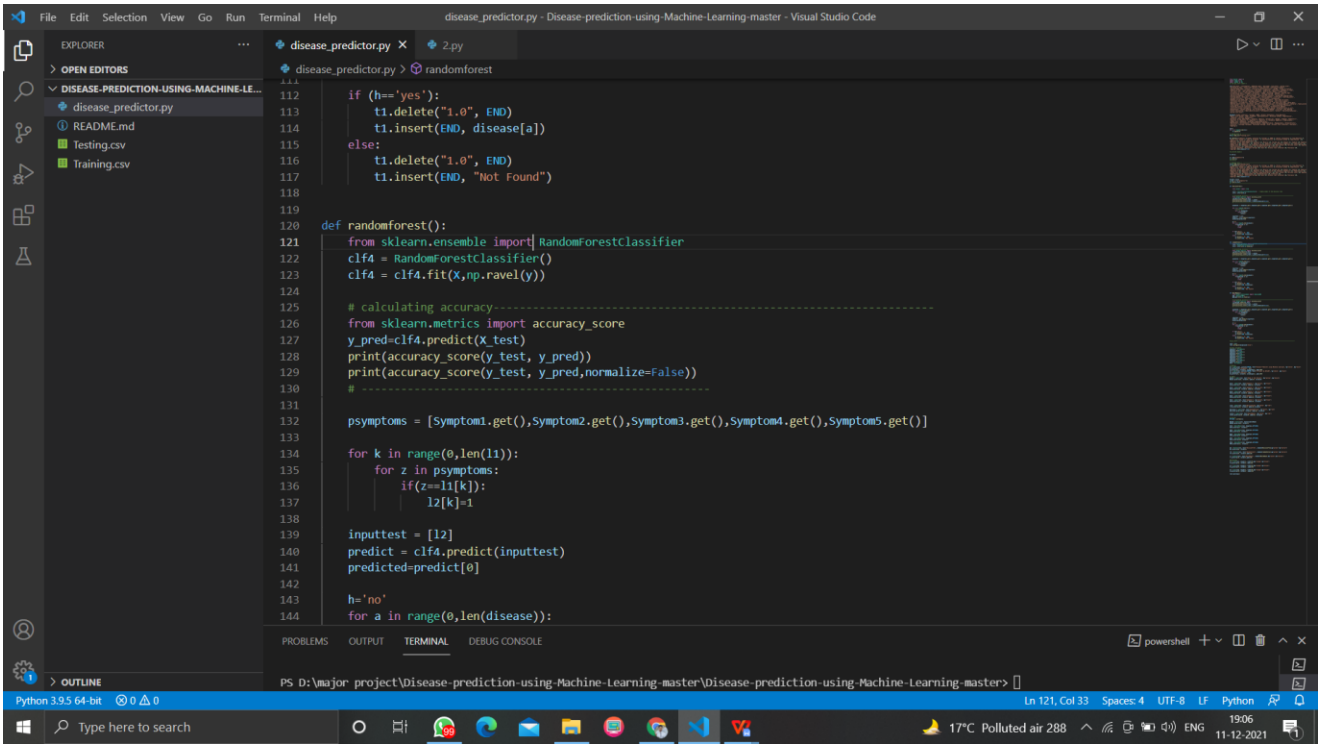
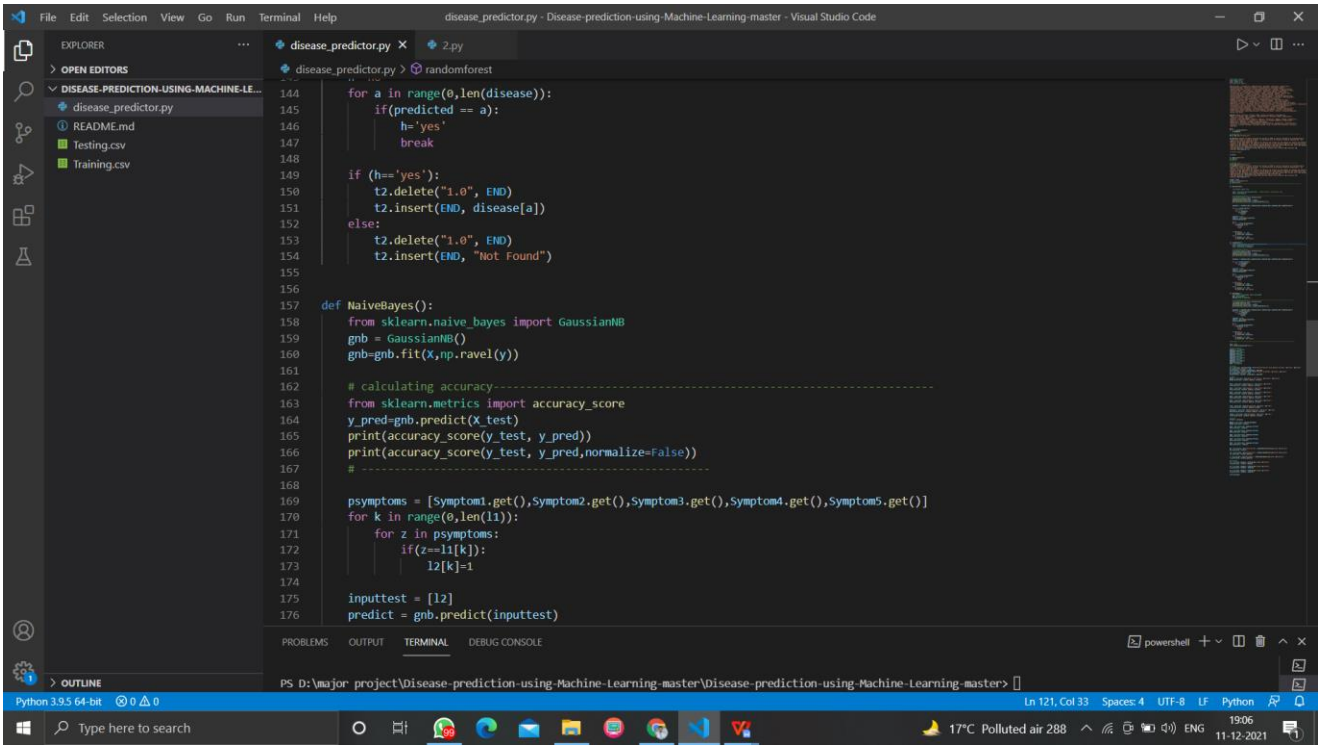
ENG
18:35
11-12-2021

Decision Tree -






File Edit Selection View Go Run Terminal Help
disease_predictor.py - Disease-prediction-using-Machine-Learning-master - Visual Studio Code
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disease_predictor.py
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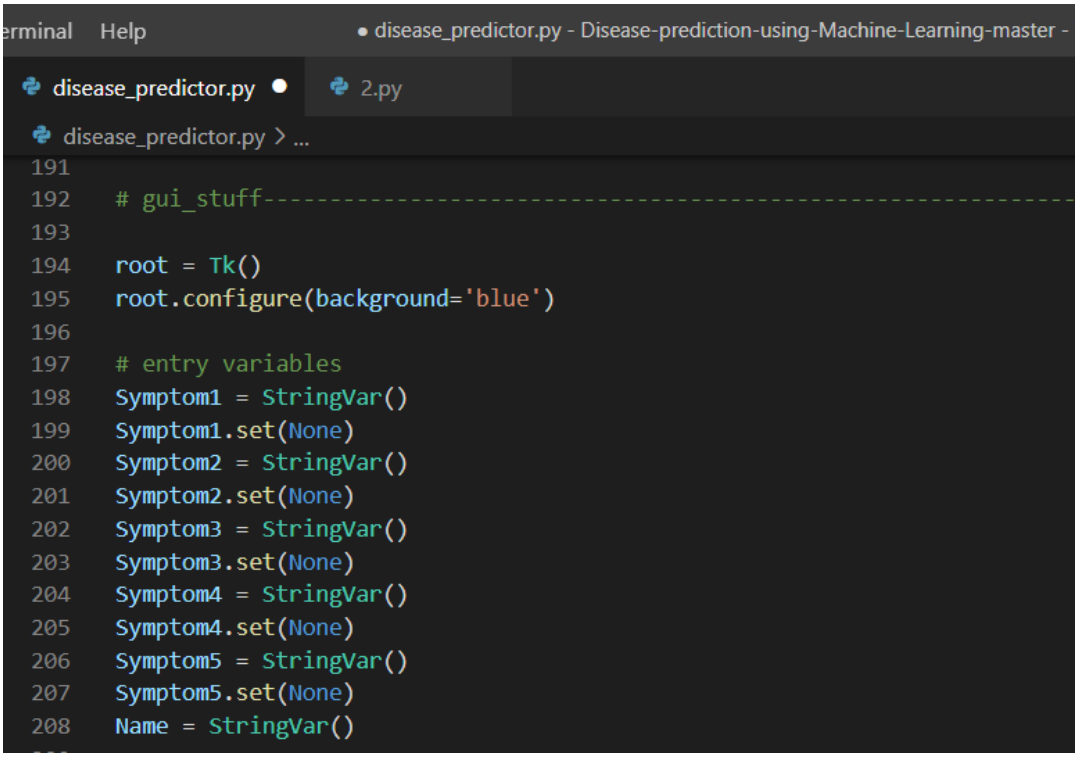
disease_predictor.py > randomforest
for a in range(0,len(disease)):
if(predicted == a):
h='yes'
break
if (h=='yes'):
t2.delete("1.0", END)
t2.insert(END, disease[a])
else:
t2.delete("1.0", END)
t2.insert(END, "Not Found")
def NaiveBayes():
from sklearn.naive_bayes import GaussianNB
gnb = GaussianNB()
gnb=gnb.fit(X,np.ravel(y))
# calculating accuracy
from sklearn.metrics import accuracy_score
y_pred=gnb.predict(X_test)
print(accuracy_score(y_test, y_pred))
print(accuracy_score(y_test, y_pred,normalize=False))
psymptoms = [Symptom1.get(),Symptom2.get(),Symptom3.get(),Symptom4.get(),Symptom5.get()]
for k in range(0,len(l1)):
for z in psymptoms:
if(z==l1[k]):
l2[k]=1
inputtest = [l2]
predict = gnb.predict(inputtest)
PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE
powershell
PS D:\major project\Disease-prediction-using-Machine-Learning-master\Disease-prediction-using-Machine-Learning-master>
OUTLINE
Python 3.9.5 64-bit
Ln 121, Col 33 Spaces: 4 UTF-8 LF Python
Type here to search
17°C Polluted air 288
ENG
19:06
11-12-2021

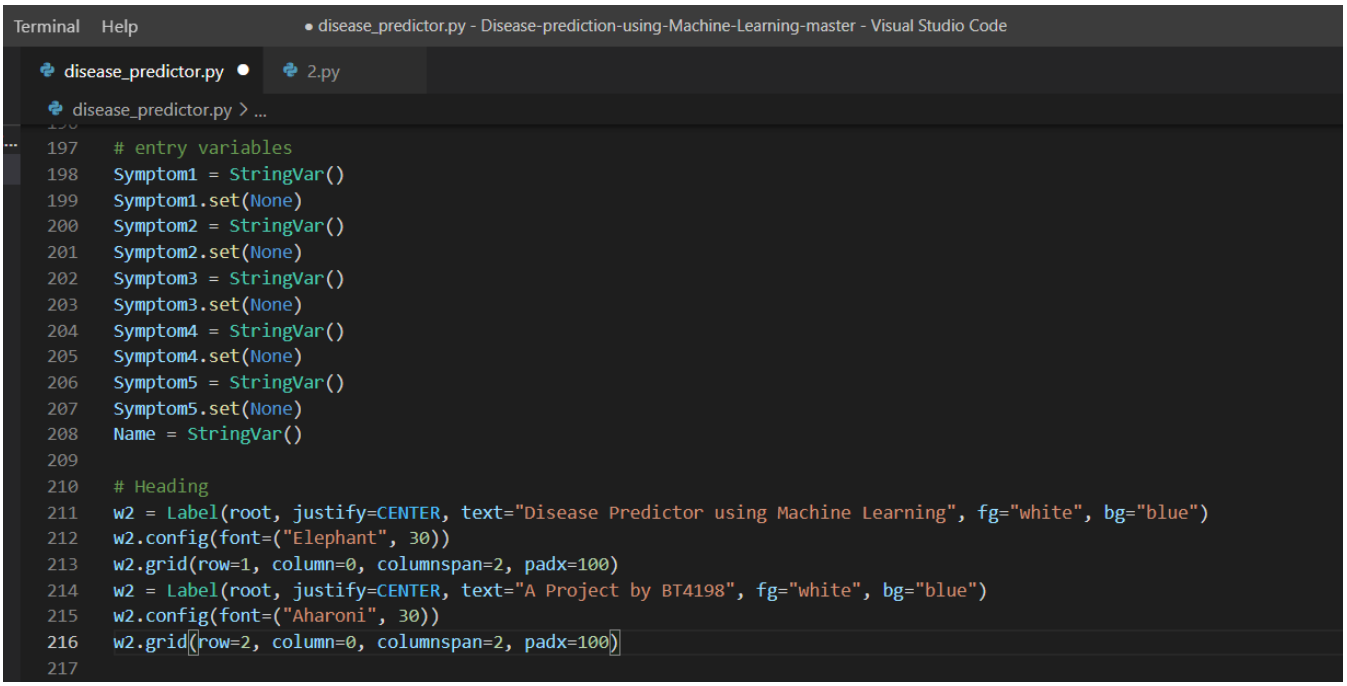
Terminal Help
disease_predictor.py - Disease-prediction-using-Machine-Learning-master - Visual Studio Code
disease_predictor.py
2.py
disease_predictor.py > randomforest
print(accuracy_score(y_test, y_pred))
print(accuracy_score(y_test, y_pred,normalize=False))
# ----------
psymptoms = [Symptom1.get(),Symptom2.get(),Symptom3.get(),Symptom4.get(),Symptom5.get()]
for k in range(0,len(l1)):
for z in psymptoms:
if(z==l1[k]):
l2[k]=1
inputtest = [l2]
predict = gnb.predict(inputtest)
predicted=predict[0]
h='no'
for a in range(0,len(disease)):
if(predicted == a):
h='yes'
break
if (h=='yes'):
t3.delete("1.0", END)
t3.insert(END, disease[a])
else:
t3.delete("1.0", END)
t3.insert(END, "Not Found")

Graphical User Interface-

1. Entry Variables-



2. Heading-


Terminal Help
• disease_predictor.py - Disease-prediction-using-Machine-Learning-master - Visual Studio Code
disease_predictor.py
2.py
disease_predictor.py > ...
197 # entry variables
198 Symptom1 = StringVar()
199 Symptom1.set(None)
200 Symptom2 = StringVar()
201 Symptom2.set(None)
202 Symptom3 = StringVar()
203 Symptom3.set(None)
204 Symptom4 = StringVar()
205 Symptom4.set(None)
206 Symptom5 = StringVar()
207 Symptom5.set(None)
208 Name = StringVar()
209
210 # Heading
211 w2 = Label(root, justify=CENTER, text="Disease Predictor using Machine Learning", fg="white", bg="blue")
212 w2.config(font=("Elephant", 30))
213 w2.grid(row=1, column=0, columnspan=2, padx=100)
214 w2 = Label(root, justify=CENTER, text="A Project by BT4198", fg="white", bg="blue")
215 w2.config(font=("Aharoni", 30))
216 w2.grid(row=2, column=0, columnspan=2, padx=100)
217

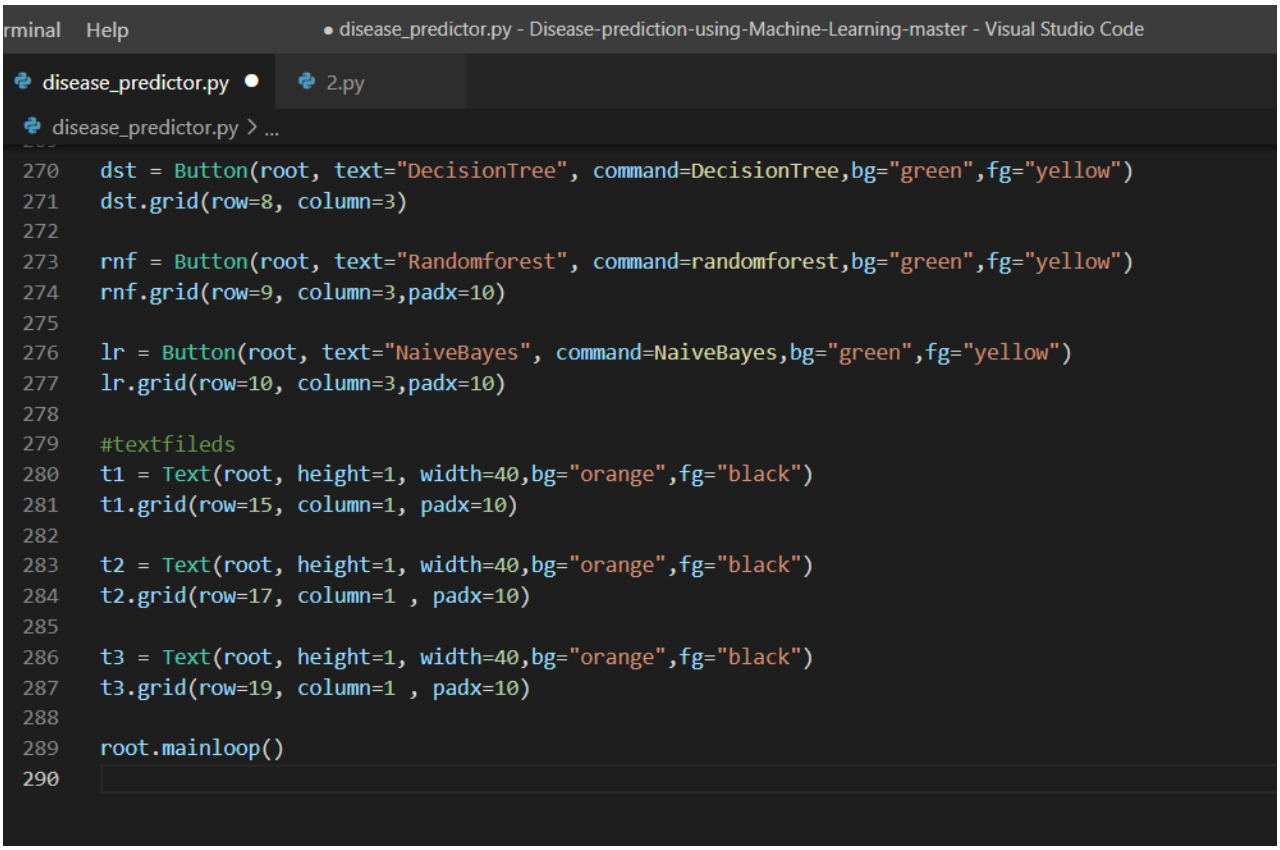
3. Labels-

```
218  # labels
219  NameLb = Label(root, text="Name of the Patient", fg="yellow", bg="black")
220  NameLb.grid(row=6, column=0, pady=15, sticky=W)
221
222
223  S1Lb = Label(root, text="Symptom 1", fg="yellow", bg="black")
224  S1Lb.grid(row=7, column=0, pady=10, sticky=W)
225
226  S2Lb = Label(root, text="Symptom 2", fg="yellow", bg="black")
227  S2Lb.grid(row=8, column=0, pady=10, sticky=W)
228
229  S3Lb = Label(root, text="Symptom 3", fg="yellow", bg="black")
230  S3Lb.grid(row=9, column=0, pady=10, sticky=W)
231
232  S4Lb = Label(root, text="Symptom 4", fg="yellow", bg="black")
233  S4Lb.grid(row=10, column=0, pady=10, sticky=W)
234
235  S5Lb = Label(root, text="Symptom 5", fg="yellow", bg="black")
236  S5Lb.grid(row=11, column=0, pady=10, sticky=W)
237
238
239  lrLb = Label(root, text="DecisionTree", fg="white", bg="red")
240  lrLb.grid(row=15, column=0, pady=10,sticky=W)
241
242  destreeLb = Label(root, text="RandomForest", fg="white", bg="red")
243  destreeLb.grid(row=17, column=0, pady=10, sticky=W)
244
245  ranfLb = Label(root, text="NaiveBayes", fg="white", bg="red")
246  ranfLb.grid(row=19, column=0, pady=10, sticky=W)
247
```

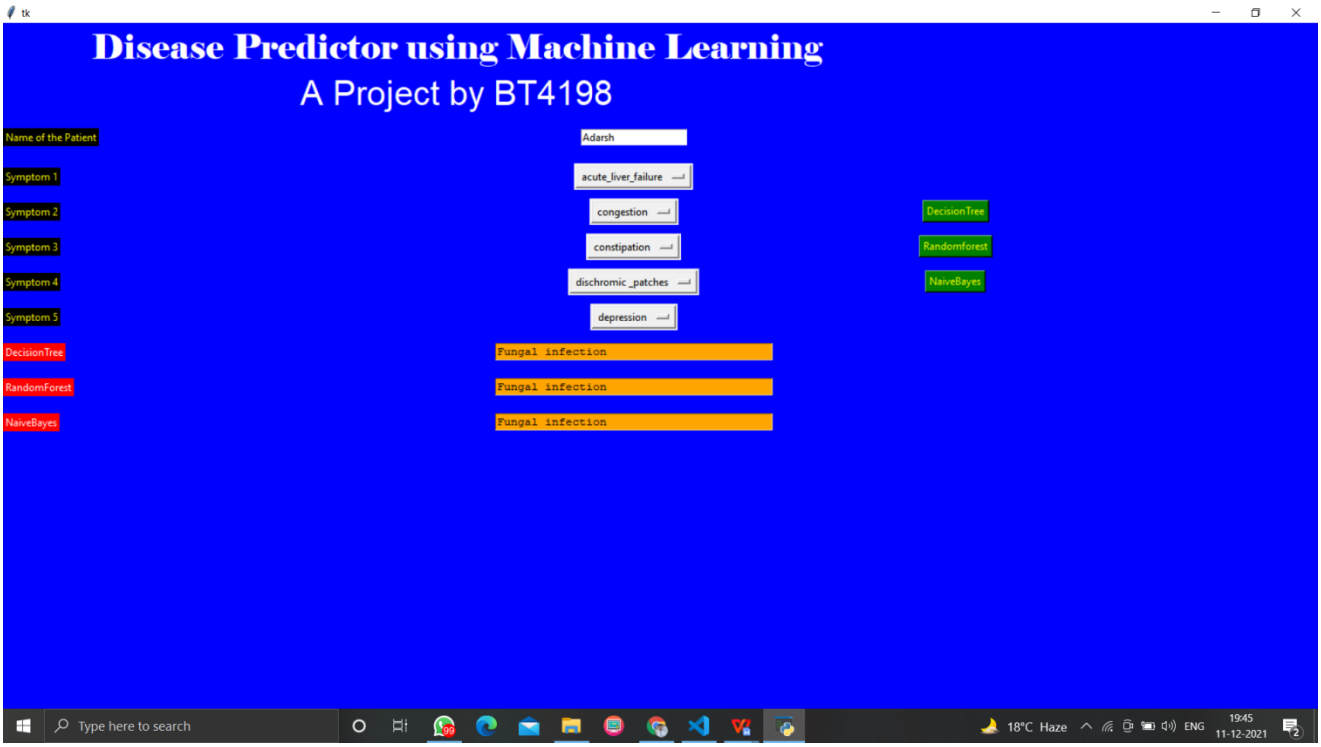
4. Entries-

```
248  # entries
249  OPTIONS = sorted(l1)
250
251  NameEn = Entry(root, textvariable=Name)
252  NameEn.grid(row=6, column=1)
253
254  S1En = OptionMenu(root, Symptom1,*OPTIONS)
255  S1En.grid(row=7, column=1)
256
257  S2En = OptionMenu(root, Symptom2,*OPTIONS)
258  S2En.grid(row=8, column=1)
259
260  S3En = OptionMenu(root, Symptom3,*OPTIONS)
261  S3En.grid(row=9, column=1)
262
263  S4En = OptionMenu(root, Symptom4,*OPTIONS)
264  S4En.grid(row=10, column=1)
265
266  S5En = OptionMenu(root, Symptom5,*OPTIONS)
267  S5En.grid(row=11, column=1)
268
269
270  dst = Button(root, text="DecisionTree", command=DecisionTree,bg="green",fg="yellow")
271  dst.grid(row=8, column=3)
272
273  rnf = Button(root, text="Randomforest", command=randomforest,bg="green",fg="yellow")
274  rnf.grid(row=9, column=3,padx=10)
275
276  lr = Button(root, text="NaiveBayes", command=NaiveBayes,bg="green",fg="yellow")
277  lr.grid(row=10, column=3,padx=10)
278
```

5. Textfields-



6. Screenshots After Running-



Source Code-

```
from tkinter import *
import numpy as np
import pandas as pd
# from gui_stuff import *

l1=['back_pain','constipation','abdominal_pain','diarrhoea','mild_fever','yellow_urin
e',
'yellowing_of_eyes','acute_liver_failure','fluid_overload','swelling_of_stomach',
'swelled_lymph_nodes','malaise','blurred_and_distorted_vision','phlegm','throat_irr
itation',
'redness_of_eyes','sinus_pressure','runny_nose','congestion','chest_pain','weakness_
in_limbs',
'fast_heart_rate','pain_during_bowel_movements','pain_in_anal_region','bloody_st
ool',
'irritation_in_anus','neck_pain','dizziness','cramps','bruising','obesity','swollen_legs'
,
'swollen_blood_vessels','puffy_face_and_eyes','enlarged_thyroid','brittle_nails',
'swollen_extremeties','excessive_hunger','extra_marital_contacts','drying_and_tingl
ing_lips',
'slurred_speech','knee_pain','hip_joint_pain','muscle_weakness','stiff_neck','swellin
g_joints',
'movement_stiffness','spinning_movements','loss_of_balance','unsteadiness',
'weakness_of_one_body_side','loss_of_smell','bladder_discomfort','foul_smell_of
urine',
'continuous_feel_of_urine','passage_of_gases','internal_itching','toxic_look_(typho
s)',
'depression','irritability','muscle_pain','altered_sensorium','red_spots_over_body','b
elly_pain',
'abnormal_menstruation','dischromic
_patches','watering_from_eyes','increased_appetite','polyuria','family_history','muc
oid_sputum',
'rusty_sputum','lack_of_concentration','visual_disturbances','receiving_blood_trans
fusion',
'receiving_unsterile_injections','coma','stomach_bleeding','distention_of_abdomen',
'history_of_alcohol_consumption','fluid_overload','blood_in_sputum','prominent_v
eins_on_calf',
```

```
'palpitations','painful_walking','pus_filled_pimples','blackheads','scurring','skin_pee
ling',
'silver_like_dusting','small_dents_in_nails','inflammatory_nails','blister','red_sore_
around_nose',
'yellow_crust_ooze']

disease=['Fungal infection','Allergy','GERD','Chronic cholestasis','Drug Reaction',
'Peptic ulcer diseae','AIDS','Diabetes','Gastroenteritis','Bronchial
Asthma','Hypertension',
' Migraine','Cervical spondylosis',
'Paralysis (brain hemorrhage)','Jaundice','Malaria','Chicken
pox','Dengue','Typhoid','hepatitis A',
'Hepatitis B','Hepatitis C','Hepatitis D','Hepatitis E','Alcoholic
hepatitis','Tuberculosis',
'Common Cold','Pneumonia','Dimorphic hemmorhoids(piles)',
'Heartattack','Varicoseveins','Hypothyroidism','Hyperthyroidism','Hypoglycemia','
Osteoarthristis',
'Arthritis','(vertigo) Paroymsal  Positional Vertigo','Acne','Urinary tract
infection','Psoriasis',
'Impetigo']

l2=[]
for x in range(0,len(l1)):
    l2.append(0)

# TESTING DATA df -------------------------------------------------------------------
-------------
df=pd.read_csv("Training.csv")

df.replace({'prognosis':{'Fungal infection':0,'Allergy':1,'GERD':2,'Chronic
cholestasis':3,'Drug Reaction':4,
'Peptic ulcer diseae':5,'AIDS':6,'Diabetes ':7,'Gastroenteritis':8,'Bronchial
Asthma':9,'Hypertension ':10,
'Migraine':11,'Cervical spondylosis':12,
'Paralysis (brain hemorrhage)':13,'Jaundice':14,'Malaria':15,'Chicken
pox':16,'Dengue':17,'Typhoid':18,'hepatitis A':19,
'Hepatitis B':20,'Hepatitis C':21,'Hepatitis D':22,'Hepatitis E':23,'Alcoholic
hepatitis':24,'Tuberculosis':25,
'Common Cold':26,'Pneumonia':27,'Dimorphic hemmorhoids(piles)':28,'Heart
attack':29,'Varicose veins':30,'Hypothyroidism':31,
```

```
'Hyperthyroidism':32,'Hypoglycemia':33,'Osteoarthristis':34,'Arthritis':35,
'(vertigo) Paroymsal  Positional Vertigo':36,'Acne':37,'Urinary tract
infection':38,'Psoriasis':39,
'Impetigo':40}},inplace=True)

# print(df.head())

X= df[l1]

y = df[["prognosis"]]
np.ravel(y)
# print(y)

# TRAINING DATA tr ----------------------------------------------------------------------
---------
tr=pd.read_csv("Testing.csv")
tr.replace({'prognosis':{'Fungal infection':0,'Allergy':1,'GERD':2,'Chronic
cholestasis':3,'Drug Reaction':4,
'Peptic ulcer diseae':5,'AIDS':6,'Diabetes ':7,'Gastroenteritis':8,'Bronchial
Asthma':9,'Hypertension ':10,
'Migraine':11,'Cervical spondylosis':12,
'Paralysis (brain hemorrhage)':13,'Jaundice':14,'Malaria':15,'Chicken
pox':16,'Dengue':17,'Typhoid':18,'hepatitis A':19,
'Hepatitis B':20,'Hepatitis C':21,'Hepatitis D':22,'Hepatitis E':23,'Alcoholic
hepatitis':24,'Tuberculosis':25,
'Common Cold':26,'Pneumonia':27,'Dimorphic hemmorhoids(piles)':28,'Heart
attack':29,'Varicose veins':30,'Hypothyroidism':31,
'Hyperthyroidism':32,'Hypoglycemia':33,'Osteoarthristis':34,'Arthritis':35,
'(vertigo) Paroymsal  Positional Vertigo':36,'Acne':37,'Urinary tract
infection':38,'Psoriasis':39,
'Impetigo':40}},inplace=True)

X_test= tr[l1]
y_test = tr[["prognosis"]]
np.ravel(y_test)
# ----------------------------------------------------------------------------------------
----

def DecisionTree():
```

```
    from sklearn import tree

    clf3 = tree.DecisionTreeClassifier()   # empty model of the decision tree
    clf3 = clf3.fit(X,y)

    # calculating accuracy-------------------------------------------------------------------
    from sklearn.metrics import accuracy_score
    y_pred=clf3.predict(X_test)
    print(accuracy_score(y_test, y_pred))
    print(accuracy_score(y_test, y_pred,normalize=False))
    # ---------------------------------------------------

    psymptoms =
[Symptom1.get(),Symptom2.get(),Symptom3.get(),Symptom4.get(),Symptom5.get
()]

    for k in range(0,len(l1)):
        # print (k,)
        for z in psymptoms:
            if(z==l1[k]):
                l2[k]=1

    inputtest = [l2]
    predict = clf3.predict(inputtest)
    predicted=predict[0]

    h='no'
    for a in range(0,len(disease)):
        if(predicted == a):
            h='yes'
            break


    if (h=='yes'):
        t1.delete("1.0", END)
        t1.insert(END, disease[a])
    else:
        t1.delete("1.0", END)
        t1.insert(END, "Not Found")
```

```
def randomforest():
    from sklearn.ensemble import RandomForestClassifier
    clf4 = RandomForestClassifier()
    clf4 = clf4.fit(X,np.ravel(y))

    # calculating accuracy----------------------------------------------------------------
    from sklearn.metrics import accuracy_score
    y_pred=clf4.predict(X_test)
    print(accuracy_score(y_test, y_pred))
    print(accuracy_score(y_test, y_pred,normalize=False))
    # ---------------------------------------------------

    psymptoms =
[Symptom1.get(),Symptom2.get(),Symptom3.get(),Symptom4.get(),Symptom5.get
()]

    for k in range(0,len(l1)):
        for z in psymptoms:
            if(z==l1[k]):
                l2[k]=1

    inputtest = [l2]
    predict = clf4.predict(inputtest)
    predicted=predict[0]

    h='no'
    for a in range(0,len(disease)):
        if(predicted == a):
            h='yes'
            break

    if (h=='yes'):
        t2.delete("1.0", END)
        t2.insert(END, disease[a])
    else:
        t2.delete("1.0", END)
        t2.insert(END, "Not Found")
```

```
def NaiveBayes():
    from sklearn.naive_bayes import GaussianNB
    gnb = GaussianNB()
    gnb=gnb.fit(X,np.ravel(y))

    # calculating accuracy-------------------------------------------------------------------
    from sklearn.metrics import accuracy_score
    y_pred=gnb.predict(X_test)
    print(accuracy_score(y_test, y_pred))
    print(accuracy_score(y_test, y_pred,normalize=False))
    # ---------------------------------------------------

    psymptoms =
[Symptom1.get(),Symptom2.get(),Symptom3.get(),Symptom4.get(),Symptom5.get
()]
    for k in range(0,len(l1)):
        for z in psymptoms:
            if(z==l1[k]):
                l2[k]=1

    inputtest = [l2]
    predict = gnb.predict(inputtest)
    predicted=predict[0]

    h='no'
    for a in range(0,len(disease)):
        if(predicted == a):
            h='yes'
            break

    if (h=='yes'):
        t3.delete("1.0", END)
        t3.insert(END, disease[a])
    else:
        t3.delete("1.0", END)
        t3.insert(END, "Not Found")

# gui_stuff------------------------------------------------------------------------------------

root = Tk()
```

```
root.configure(background='blue')

# entry variables
Symptom1 = StringVar()
Symptom1.set(None)
Symptom2 = StringVar()
Symptom2.set(None)
Symptom3 = StringVar()
Symptom3.set(None)
Symptom4 = StringVar()
Symptom4.set(None)
Symptom5 = StringVar()
Symptom5.set(None)
Name = StringVar()

# Heading
w2 = Label(root, justify=CENTER, text="Disease Predictor using Machine
Learning", fg="white", bg="blue")
w2.config(font=("Elephant", 30))
w2.grid(row=1, column=0, columnspan=2, padx=100)
w2 = Label(root, justify=CENTER, text="A Project by BT4198", fg="white",
bg="blue")
w2.config(font=("Aharoni", 30))
w2.grid(row=2, column=0, columnspan=2, padx=100)

# labels
NameLb = Label(root, text="Name of the Patient", fg="yellow", bg="black")
NameLb.grid(row=6, column=0, pady=15, sticky=W)


S1Lb = Label(root, text="Symptom 1", fg="yellow", bg="black")
S1Lb.grid(row=7, column=0, pady=10, sticky=W)

S2Lb = Label(root, text="Symptom 2", fg="yellow", bg="black")
S2Lb.grid(row=8, column=0, pady=10, sticky=W)

S3Lb = Label(root, text="Symptom 3", fg="yellow", bg="black")
S3Lb.grid(row=9, column=0, pady=10, sticky=W)

S4Lb = Label(root, text="Symptom 4", fg="yellow", bg="black")
```

```
S4Lb.grid(row=10, column=0, pady=10, sticky=W)

S5Lb = Label(root, text="Symptom 5", fg="yellow", bg="black")
S5Lb.grid(row=11, column=0, pady=10, sticky=W)


lrLb = Label(root, text="DecisionTree", fg="white", bg="red")
lrLb.grid(row=15, column=0, pady=10,sticky=W)

destreeLb = Label(root, text="RandomForest", fg="white", bg="red")
destreeLb.grid(row=17, column=0, pady=10, sticky=W)

ranfLb = Label(root, text="NaiveBayes", fg="white", bg="red")
ranfLb.grid(row=19, column=0, pady=10, sticky=W)

# entries
OPTIONS = sorted(l1)

NameEn = Entry(root, textvariable=Name)
NameEn.grid(row=6, column=1)

S1En = OptionMenu(root, Symptom1,*OPTIONS)
S1En.grid(row=7, column=1)

S2En = OptionMenu(root, Symptom2,*OPTIONS)
S2En.grid(row=8, column=1)

S3En = OptionMenu(root, Symptom3,*OPTIONS)
S3En.grid(row=9, column=1)

S4En = OptionMenu(root, Symptom4,*OPTIONS)
S4En.grid(row=10, column=1)

S5En = OptionMenu(root, Symptom5,*OPTIONS)
S5En.grid(row=11, column=1)


dst = Button(root, text="DecisionTree",
command=DecisionTree,bg="green",fg="yellow")
dst.grid(row=8, column=3)
```

```
rnf = Button(root, text="Randomforest",
command=randomforest,bg="green",fg="yellow")
rnf.grid(row=9, column=3,padx=10)

lr = Button(root, text="NaiveBayes",
command=NaiveBayes,bg="green",fg="yellow")
lr.grid(row=10, column=3,padx=10)

#textfileds
t1 = Text(root, height=1, width=40,bg="orange",fg="black")
t1.grid(row=15, column=1, padx=10)

t2 = Text(root, height=1, width=40,bg="orange",fg="black")
t2.grid(row=17, column=1 , padx=10)

t3 = Text(root, height=1, width=40,bg="orange",fg="black")
t3.grid(row=19, column=1 , padx=10)

root.mainloop()
```

REQUIRED TOOLS

Software and Hardware Requirements:

SoftwareRequirements:

1. Python
2. Pycharm
3. DBMS

Hardware Requirements:

1. OS: Windows/Linux/Mac
2. Processor: Dual Core or higher
3. RAM: 4 GB
4. ROM: 500 GB
5. Graphic card: Good but not necessary

Result

We have successfully created the Disease Prediction Using Machine Learning (Health Buddy) application using all the necessary modules.

CONCLUSION

The main goal is to simplify integrated and informed health care systems that can ensure greater patient satisfaction. In developing countries, forecasting analysis is the next major medical concept - the next evolutionary mathematical evolution - and roles will change as a result. Patients can get more information and be able to take more responsibility for their care, if they will use the information gained. The doctor's roles can probably be transferred to more than the head counselor, who will advise, warn and assist each patient. Physicians may find great pleasure in using it as the positive effects increase and the side effects diminish. Perhaps time with each patient can grow and doctors will have time to create a positive and lasting relationship with their patients. Time to think, interact, and really help people; Relationship building is one of the reasons why doctors say they go into medicine, and when these decrease, their satisfaction with their work decreases. Hospitals, pharmaceutical organisations and insurance providers can see the changes as well. These changes will almost certainly change the way drugs are used to reduce high health and discomfort.

FUTURE WORK

Every one of us would like to have a good medical care system and physicians are expected to be medical experts and take good decisions all the time. But it’s highly unlikely to memorise all the knowledge, patient history, records needed for every situation. Although they have all the massive amount of data and information; it’s difficult to compare and analyse the symptoms of all the diseases and predict the outcome. So, integrating information into patient’s personalised profile and performing an in-depth research is beyond the scope a physician. So the solution is ever heard of a personalised healthcare plan – exclusively crafted for an individual. Predictive analytics is the process to make predictions about the future by analysing historical data. For health care, it would be convenient to make best decisions in case of every individual. Predictive modelling uses artificial intelligence to create a prediction from past records, trends, individuals, diseases and the model is deployed so that a new individual can get a prediction instantly. Health and Medicare units can use these predictive models to accurately assess when a patient can safely be released.

REFRENCES

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C. Darcy A. Davis, N. V.-L. (2008). Predicting Individual Disease Risk Based On Medical History.