

Predicting Chronic Kidney Disease With Python Machine Learning

**Early detection is key –
let's explore the potential of ML**



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INTRODUCTION

Overview

- ✓ **Chronic Kidney Disease** is one of the most critical illness nowadays and proper diagnosis is required as soon as possible.
- ✓ Machine learning technique has become reliable for medical treatment
- ✓ Chronic kidney disease, also known as “**Chronic renal disease**” or “**CKD**” is a condition characterized by a gradual loss of kidney function over time.

What Is Chronic Kidney Disease?



The gradual loss of kidney function



Symptoms include difficulty urinating, dizziness, and swelling



It's commonly caused by diabetes, high blood pressure, and glomerulonephritis



Treatment focuses on the underlying cause of kidney impairment and any complications

PURPOSE

- ✓ **The purpose of using machine learning (ML) for Chronic Kidney Disease (CKD) is to improve patient outcomes by providing more accurate and personalized diagnosis, treatment, and management of the disease.**
- ✓ **ML algorithms can be trained to analyze large datasets of patient information, such as electronic health records (EHRs) and medical imaging, to identify patterns and predict disease progression.**
- ✓ **ML can also be used to identify patients at higher risk of developing CKD-related complications, such as cardiovascular disease, and provide personalized care plans to mitigate these risks.**

PROBLEM DEFINITION & DESIGN THINKING

Empathy Map

- ✓ **Empathy map is a tool used to better understand a particular group of people or a target audience.**
- ✓ **It helps to create a visual representation of what a group of people think, feel, see, hear, and do, as well as their pain points and needs.**



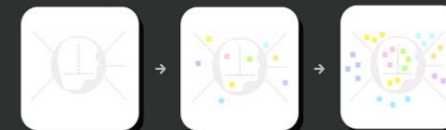
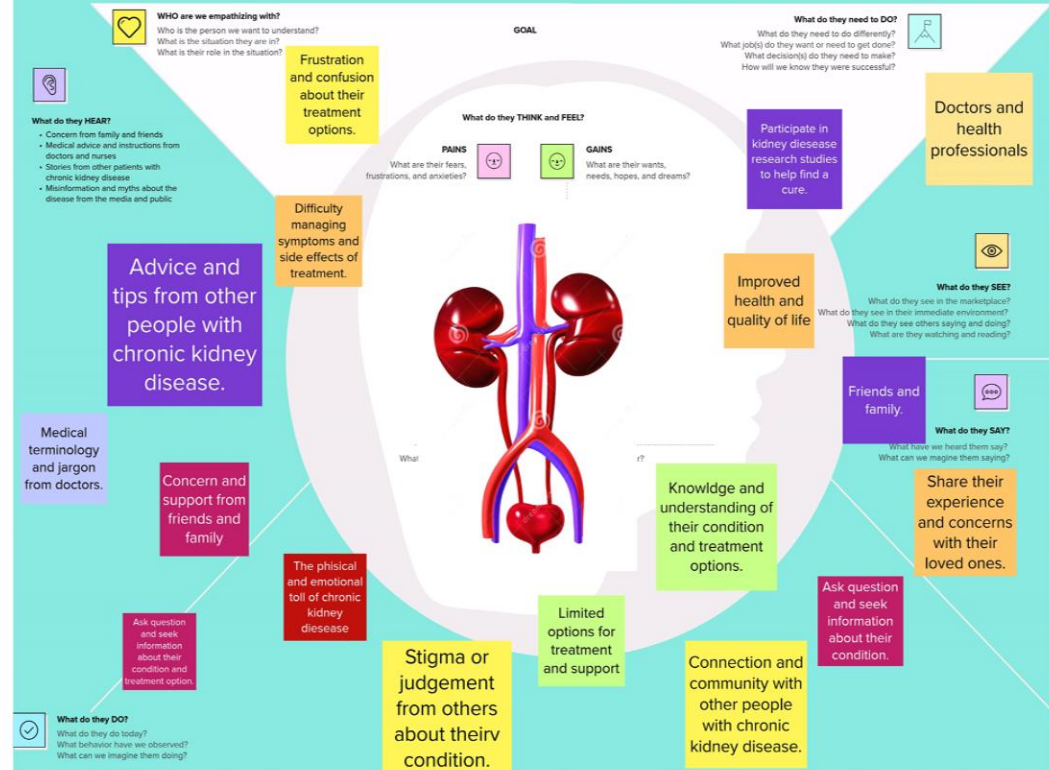
Empathy map canvas

Misinformation and myths
about the disease from the
media and public.

Originally created by Dave Gray at



Develop shared understanding and empathy USING KIDNEY DISEASE DATA SET USING MACHINE LEARNING



IDEATION

- ✓ **Ideation refers to the process of generating, developing, and expressing new ideas or concepts, often in a creative and unstructured manner.**
- ✓ **It involves brainstorming, exploring possibilities, and thinking outside the box.**
- ✓ **Ideation can be done individually or in a group, and can be used to solve problems, develop new products or services, or generate innovative approaches to a particular challenge.**

IDEA FOR CHRONIC KIDNEY DISEASE



GROUP- MEMBERS

M.Jothika

Collect the
dataset

Import
library
files

Data
preperation

DataMining
Techniques

K.Dhivyashree

Artificial
Neural
Network
model

Random
Forest
model

Decision
Tree model

Logistic
Regression

H.Imrana Parveen

Descriptive
data
Analysis

Visual
Analysis

Univariate
Analysis

Bivariate
Analysis

P.Jeya Chithra

Integrated
web
network

Building a
flask
application

Building
HTML
pages

Building
server-side
script

BRAINSTORMING MAP

- ✓ **A brainstorming map, also known as a mind map, is a visual diagram that represents ideas and concepts in a non-linear and hierarchical manner.**
- ✓ **It is a tool used for brainstorming, organizing thoughts, and generating new ideas.**
- ✓ **The map typically starts with a central idea or topic, and branches out into related sub-topics or ideas.**



GROUP IDEAS



M.Jothika

Collect the Dataset
Import Library Files



K.DhivyaShree

Artificial Neural Network
Random Forest Model
Decision Tree Model
Logistic Regression



H.Imrana
Parveen

Descriptive Data Analysis
visual Analysis
Univariate Analysis
Bivariate Analysis



P.Jeyachitra

Integrated web network
Build Flask application
Build Html page
Build Server page

PRIORITIZE



RESULT

Step 1: Save the best model

Step 2: Integrate with Web Framework

To create a web application in the PYCHARM using Four html templates or pages.

✓ home.html

✓ index1.html

✓ indexnew.html

✓ result.html



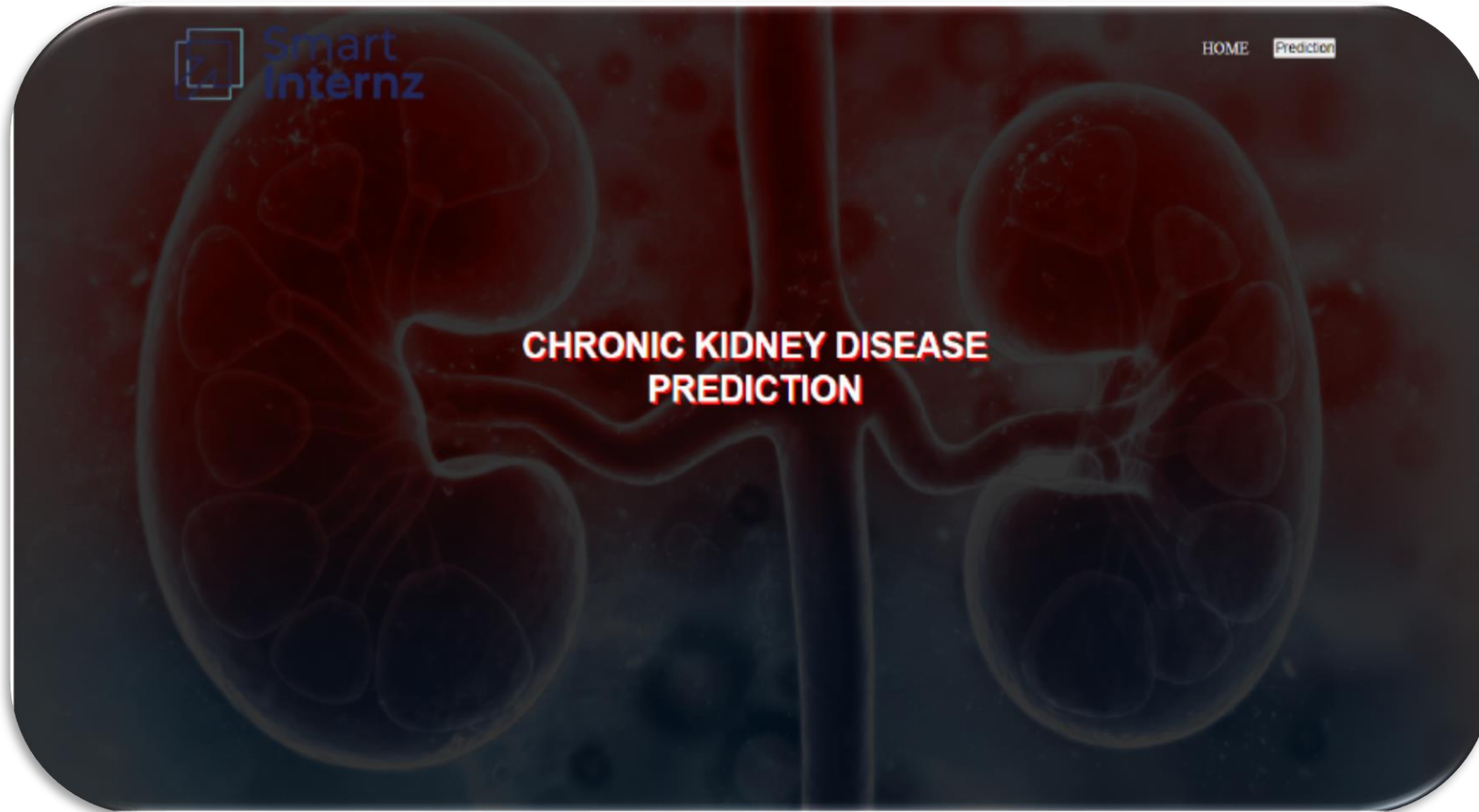
save them in the template folder

Step 3: Run the web application

✓ **Run the web application using anaconda prompt**

✓ **Go the web browser and write the localhost Url & get the result.**

Home Page



Chronic Kidney Disease

A Machine Learning Web App, Built with Flask

Enter your blood_urea
Enter your blood glucose random
Select anemia or not ▼
Select coronary artery disease or not ▼
Select pus_cell or not ▼
Select red_blood_cell level ▼
Select diabetesmellitus or not ▼
Select pedal_edema or not ▼

Predict

Input - Now, the user will give inputs to get the predicted result after clicking onto the submit button.

Chronic Kidney Disease

A Machine Learning Web App, Built with Flask

<input type="text" value="1"/>
<input type="text" value="1"/>
<input type="text" value="NO"/> ▼
<input type="text" value="NO"/> ▼
<input type="text" value="normal"/> ▼
<input type="text" value="normal"/> ▼
<input type="text" value="NO"/> ▼
<input type="text" value="NO"/> ▼

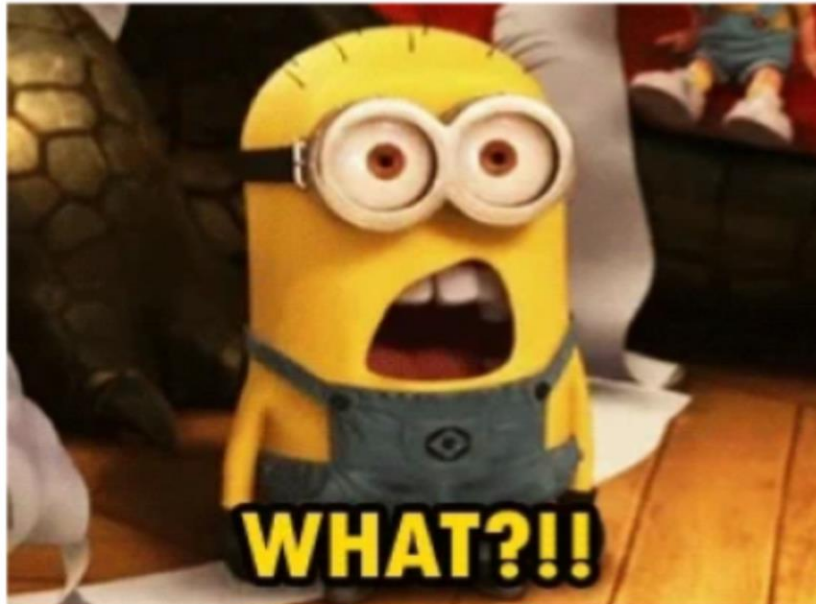
Predict

PREDICTING PAGE

Chronic Kidney Disease

A Machine Learning Web App, Built with Flask

Prediction: Oops! You have Chronic Kidney Disease.



Chronic Kidney Disease

A Machine Learning Web App, Built with Flask

Prediction: **Great! You DON'T have Chronic Kidney Disease**



ADVANTAGES

- 1. Early detection**
- 2. Personalized treatment**
- 3. Improved accuracy**
- 4. Predictive modeling**
- 5. Reduced costs**

APPLICATIONS

1. Early detection and diagnosis of CKD

Machine learning models can analyze patient data such as lab test results, medical history, and demographic information to identify early signs of CKD.

2. Prediction of CKD progression

Machine learning models can predict the progression of CKD and identify patients who are at risk of developing complications.

3. Personalized treatment plans

Machine learning models can analyze patient data to recommend personalized treatment plans that are tailored to the patient's specific needs.

4. Identification of novel biomarkers

Machine learning can help identify new biomarkers that can be used to diagnose and monitor CKD.

CONCLUSION

- ✓ **Machine learning has shown great promise in the field of (CKD) management.**
- ✓ **Through the use of various machine learning techniques such as decision trees, support vector machines, neural networks, and others, CKD prediction, diagnosis, and management can be significantly improved.**
- ✓ **Machine learning models have the potential to analyze large amounts of data, identify complex patterns, and provide personalized predictions for CKD risk, progression, and treatment response.**
- ✓ **These models can also aid in the early detection of CKD, allowing for timely interventions to prevent or delay disease progression, and ultimately improve patient outcomes.**

FUTURE SCOPE ENHANCEMENTS

1.Early Detection and Diagnosis

2.Personalized Treatment

3 .Prognostic Models

4.Remote Patient Monitoring

5.Predictive Maintenance