



# EARLY PREDICTION FOR CHRONIC KIDNEY DISEASE

Submitted by:

**K.HEMAVARSHINI(20326ER048)**

**J.INIYA(20326ER049)**

**D.ISWARYA(20326ER050)**

**A.KARTHIKA(20326ER051)**

# Content



*1) Introduction*

*2) Problem definition&design thinking*

*3) Result*

*4) Advantages*

*5) Applications*

*6) Conclusion*

*7) Future scope*



# INTRODUCTION



## Overview:

- Chronic Kidney Disease is a progressive condition in which the kidneys gradually lose their function over time.
- 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.

A pair of hands, one at the top and one at the bottom, are shown holding two red, bean-shaped kidneys. The kidneys are positioned in the center, with their ureters extending downwards. The background is a solid teal color. The hands are rendered in a realistic style, with visible skin texture and fingernails. The overall composition suggests a medical or healthcare theme, specifically related to kidney health.

## 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.
- ❖ This can help healthcare providers to make more informed decisions about patient care, including early detection and prevention of CKD, more accurate diagnosis and staging of the disease, and better selection and monitoring of treatment options.
- ❖ 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.



# EMPATHY MAP:



- An empathy map **helps to map what a design team knows about the potential audience**. This tool helps to understand the reason behind some actions a user takes deeply. This tool helps build Empathy towards users and helps design teams shift focus from the product to the users who are going to use the product
- Using this empathy map canvas, a early prediction of chronic kidney disease using machine learning can be designed to address the needs and concerns of the user



## Empathy map canvas

Using this empathy map canvas, a early prediction of chronic kidney disease using machine learning can be designed to address the needs and concerns of the user

---

Originally created by Steve Gray at

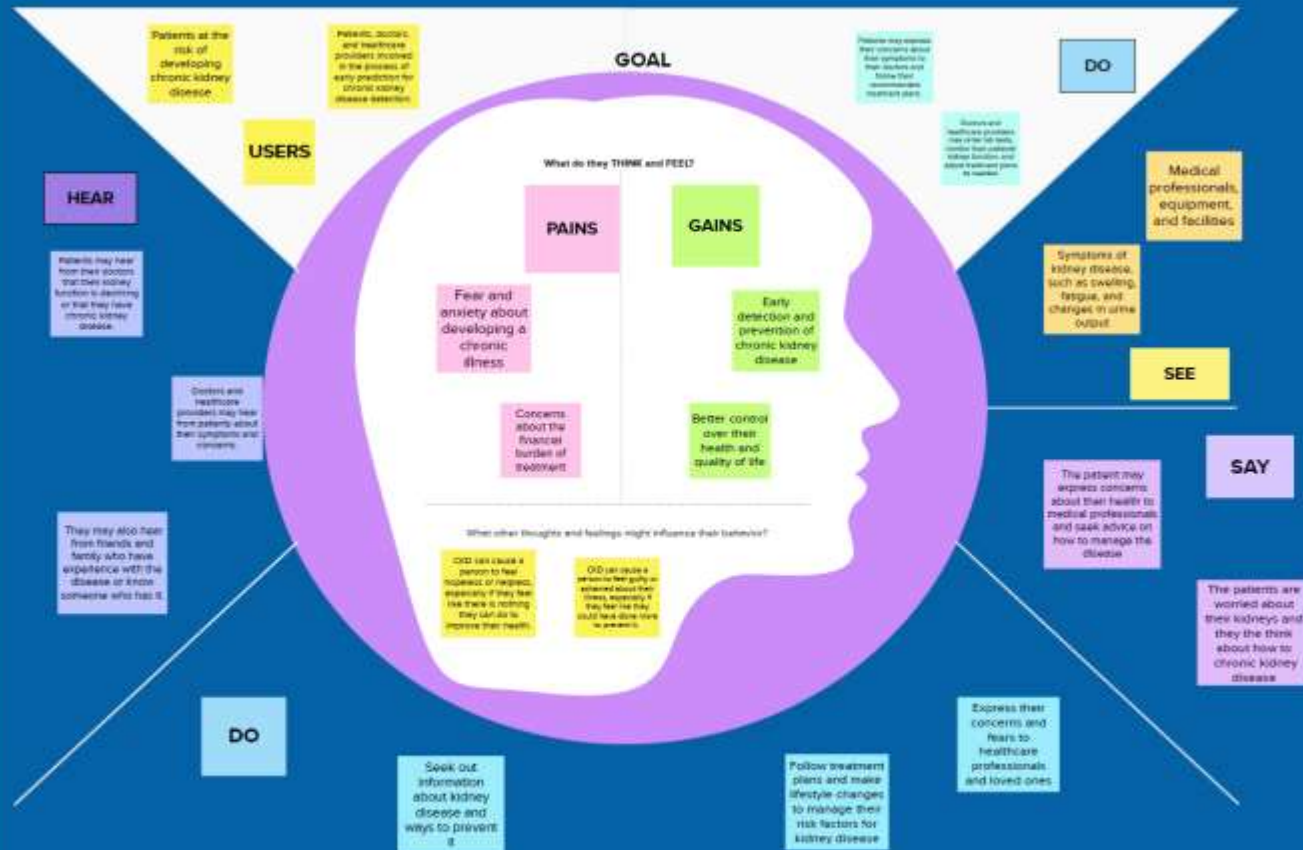


[Share template feedback](#)



## Develop shared understanding and empathy.

By using the empathy map, we are able to develop ideas.



# 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.



3

## Project Ideas

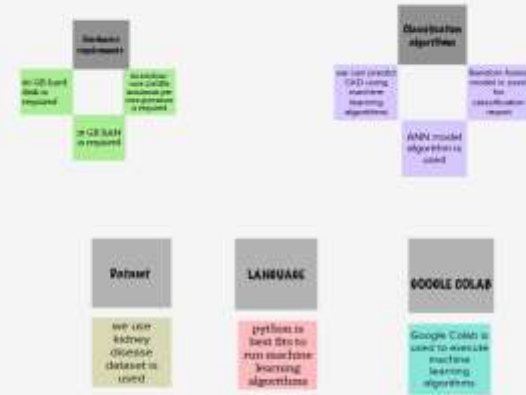
Quickly process large amount of **orthorectified** data  
Save cost associated with manual process.



3

## Group ideas

1. In an environment (e.g. RAM) is required.
2. Machine learning algorithm such as ANN model, Logistic Regression, Random Forest, etc.
3. Using Google Colab is used and it is input from Kaggle.
4. Google Colab is used to evaluate Machine learning algorithms.
5. Google Colab is used to evaluate Machine learning algorithms.



# BRAINSTORMING MAP



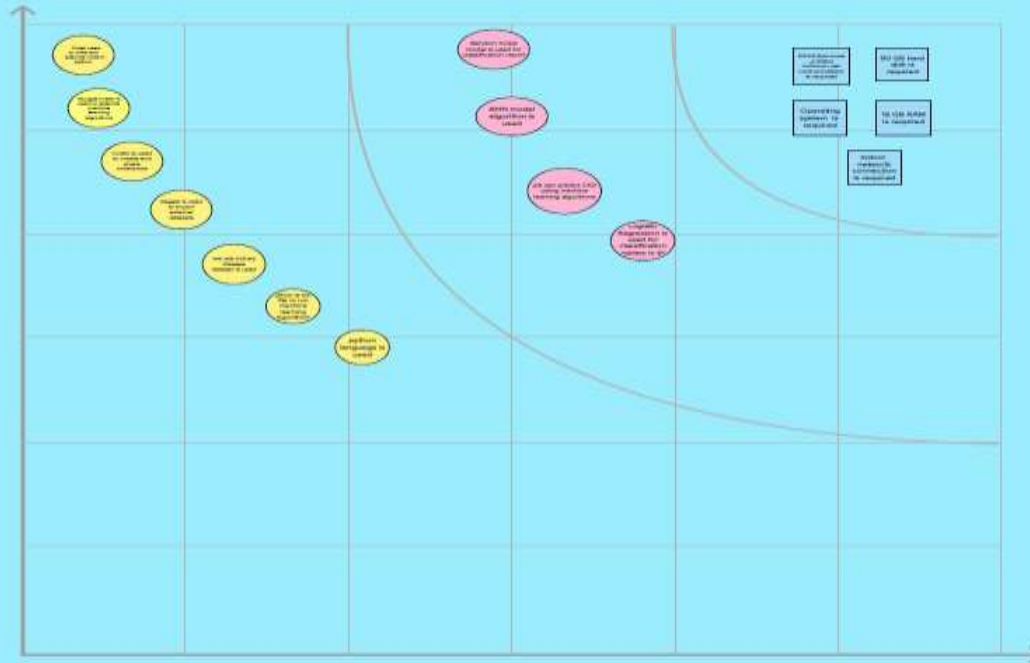
- ❑ A brainstorming map, also known as a mind map, is a visual diagram that represents ideas and concepts in a non-linear and hierarchical manner. It is a tool used for brainstorming, organizing thoughts, and generating new ideas. The map typically starts with a central idea or topic, and branches out into related sub-topics or ideas.
- ❑ Brainstorming maps are often used to help individuals or teams think creatively, organize their thoughts, and gain a better understanding of complex topics or problems.

4

### Prioritize

we prioritize the ideas based on the project requirements

🕒 20 minutes





# RESULT

- ❑ Save the best model
- ❑ Integrate with Web Framework

we will be build a web application using Four html templates or pages

- ❖ home.html
- ❖ index1.html
- ❖ indexnew.html
- ❖ result.html

## **RUN THE WEB APPLICATION**

Run the web application using anaconda prompt



## WEB 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



## PREDICTION PAGE

### Chronic Kidney Disease

*A Machine Learning Web App, Built with Flask*

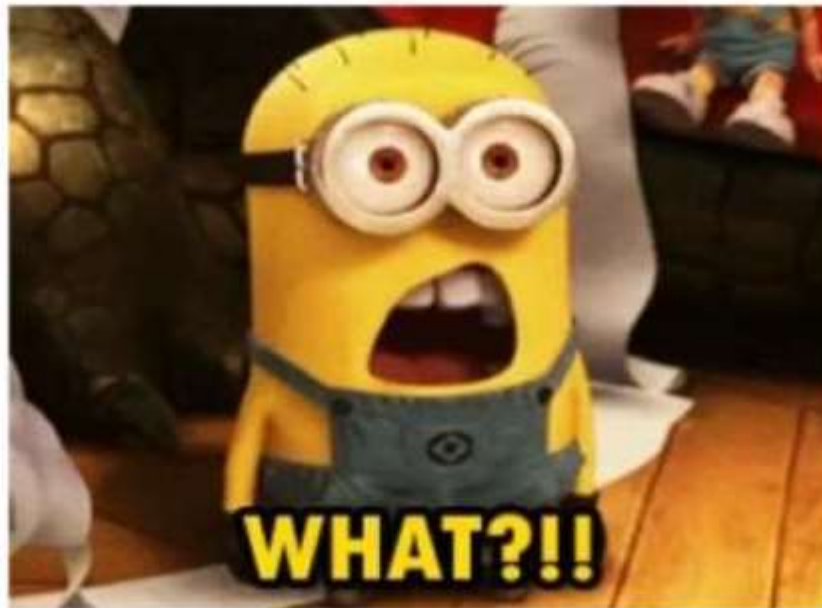
<input type="text" value="1"/>
<input type="text" value="1"/>
<input type="text" value="NO"/> ▼
<input type="text" value="NO"/> ▼
<input type="text" value="normal"/> ▼
<input type="text" value="normal"/> ▼
<input type="text" value="NO"/> ▼
<input type="text" value="NO"/> ▼

Predict

# 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:

- Early prediction
- Personalized treatment
- Improved accuracy
- Predictive modeling
- Reduced costs



# DISADVANTAGES

- 1.Data Bias
- 2.Lack of Clinical Context
- 3.Limited Generalizability
- 4.Lack of Interpretability
- 5.Data Quality

# APPLICATIONS

## ➤ 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.

## ➤ Prediction of CKD progression

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

## ➤ Personalized treatment plans

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

## ➤ 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 Chronic Kidney Disease (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**

A 3D anatomical illustration of two kidneys and the spine. A bright yellow energy beam or light source is positioned between the two kidneys, creating a glowing effect. The kidneys are rendered in a realistic, textured style, and the spine is visible in the background. The overall color scheme is dominated by blue and purple hues, with the yellow beam providing a strong contrast.

1. Early Detection and Diagnosis
2. Personalized Treatment
3. Prognostic Models
4. Remote Patient Monitoring
5. Predictive Maintenance