

## Model Development Phase Template

Date	12 <sup>th</sup> July 2024
Team ID	SWTID1720090815
Project Title	Early Prediction Of Chronic Kidney Disease Using Machine Learning
Maximum Marks	5 Marks

### Feature Selection Report

This report will streamline decision-making and enhance transparency in feature selection.

*Note: The model uses Recursive Feature Elimination (RFE) to eliminate lower ranking features on the basis of their correlation coefficient with classification.*

Feature	Description	Selected (Yes/No)	Reasoning
<b>ID</b>	Index value of records	No	Index value of records have no impact on CKD prediction.
<b>Age</b>	Patient's age	Yes	Age is a strong indicator of risk for many diseases. As we age, our bodies become more susceptible to various conditions.
<b>Blood Pressure</b>	Blood pressure. It is measured in millimeters of mercury (mmHg)	Yes	Blood pressure is a crucial vital sign. Abnormal blood pressure can be a sign of heart disease, kidney problems, and other conditions.
<b>Specific Gravity</b>	Specific gravity of Urine. It measures the concentration of particles in urine compared to water.	Yes	Specific gravity helps assess urine concentration and can indicate dehydration, kidney problems, or other conditions affecting urine output.

<b>Albumin</b>	This is a protein found in blood and urine.	Yes	Albumin presence in urine can be a sign of kidney damage or other health issues affecting protein filtration
<b>Sugar</b>	Blood sugar level, refers to the amount of glucose present in the bloodstream.	Yes	Blood sugar levels are a key indicator of diabetes and other metabolic conditions.
<b>Red Blood Cells</b>	These are cells in the blood that carry oxygen throughout the body.	Yes	RBC count is essential for oxygen transport. Low RBC can indicate anemia and various underlying conditions
<b>Pus Cells</b>	White blood cells in urine.	Yes	Pus cells indicate inflammation or infection, potentially in the urinary tract.
<b>Pus Cell Clumps</b>	Multiple pus cells grouped together.	Yes	Clumps of pus cells are a stronger indicator of infection compared to individual pus cells
<b>Bacteria</b>	Presence of bacteria in urine	Yes	A high count of bacteria in urine, along with high white blood cell counts, may indicate an infection
<b>Blood Glucose Random</b>	Blood sugar test done at a random time, without prior fasting.	Yes	This provides a snapshot of blood sugar levels at a specific time, helpful for diabetes diagnosis and monitoring.
<b>Blood Urea</b>	Urea is a waste by-product in the blood that is filtered by kidneys.	Yes	Blood urea levels reflect kidney function. High levels can suggest kidney problems.
<b>Serum Creatinine</b>	Creatinine is a waste product in the blood filtered by the kidneys.	Yes	Similar to blood urea, serum creatinine is another marker of kidney function.

<b>Sodium</b>	An electrolyte that helps regulate fluids in the body.	Yes	Sodium imbalances can affect blood pressure, muscle function, and other bodily processes.
<b>Potassium</b>	An electrolyte that plays crucial role in nerve and muscle function.	Yes	Potassium levels are crucial for nerve and muscle function. Abnormal levels can cause various issues.
<b>Haemoglobin</b>	Protein in RBC that carries oxygen.	Yes	Low hemoglobin is a sign of anemia.
<b>Packed Cell Volume</b>	Percentage of red blood cells in whole blood.	No	Rejected due to high multicollinearity (85%) with haemoglobin.
<b>White Blood Cell Count</b>	Total number of white blood cells in the bloodstream.	Yes	Abnormally high or low WBC can indicate various conditions.
<b>Red Blood Cell Count</b>	Number of red blood cells in bloodstream.	Yes	It is a general indicator of abnormalities in a human.
<b>Hypertension</b>	Chronic condition where blood pressure remains consistently elevated, which can increase the risk of heart disease and stroke.	Yes	Existing hypertension condition, can help analyze patterns.
<b>Diabetes Mellitus</b>	Group of metabolic disorders characterized by high blood sugar levels due to problems with insulin production or function	Yes	Existing diabetic condition, can help analyze patterns.

<b>Coronary Artery Disease</b>	Arteries supplying blood to the heart become narrowed or blocked by plaque buildup.	Yes	Reduced blood flow can potentially lead to heart attack or angina.
<b>Appetite</b>	Person's desire to eat.	No	Rejected during Recursive Feature Elimination technique automatically based on their correlation coefficient ranking.
<b>Peda Edema</b>	Swelling in feet.	No	Rejected during Recursive Feature Elimination technique automatically based on their correlation coefficient ranking.
<b>Anemia</b>	Blood has lower than normal number of red blood cells or hemoglobin.	No	Rejected during Recursive Feature Elimination technique automatically based on their correlation coefficient ranking.
<b>Classification</b>	Presence or absence of chronic kidney disease	No	It is the target column. Hence, it will only be used to assess the performance of the model.