# Model Development Phase Template

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| Date | 07 July 2024 |
| Team ID | SWTID1720082372 |
| Project Title | Early Prediction of Chronic Kidney Disease Using Machine Learning |
| Maximum Marks | 5 Marks |

## Feature Selection Report Template

In the forthcoming update, each feature will be accompanied by a brief description. Users will indicate whether it's selected or not, providing reasoning for their decision. This process will streamline decision-making and enhance transparency in feature selection.

| Feature | Description | Selected (Yes/No) | Reasoning |
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| ID | Unique identifier for each policyholder | No | Not predictive of CKD; used only for record-keeping. |
| Age | Strong predictor of CKD risk as it increases with age. | Yes | Critical factor as CKD risk increases with age. |
| Blood Pressure | High blood pressure can damage kidneys. | No | While related to kidney health, other factors may be more directly indicative of CKD. |

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| Specific Gravity | Specific gravity in urine indicates kidney function. | No | May be redundant with other more specific kidney function indicators. |
| Albumin | High albumin in urine can be a sign of kidney damage. | Yes | Key indicator of kidney filtration efficiency. |
| Sugar | Presence of sugar in urine might indicate diabetes, a CKD risk factor. | Yes | Important for assessing diabetes risk, a major CKD contributor. |
| Red Blood Cells | Red blood cells in urine can suggest kidney problems. | No | May not provide unique information for CKD prediction. |
| Pus Cell | Pus cells in urine can indicate infection, potentially affecting kidneys. | No | More indicative of acute infections than chronic kidney issues. |
| Puss Cell Clumps | Pus cell clumps might suggest a more severe urinary tract infection. | No | Similar to individual pus cells, may not be specific to CKD. |
| Bacteria | Presence of bacteria in urine indicates infection, | No | More relevant to acute infections than chronic kidney disease. |

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| | stressing kidneys. | | |
| Blood Glucose Random | Random blood sugar level can help identify diabetes, a CKD risk factor. | Yes | Crucial for diabetes assessment, a significant CKD risk factor. |
| Blood Urea | Blood urea level reflects kidney function. | Yes | Direct measure of kidney's ability to filter waste. |
| Serum Creatinine | Serum creatinine level is a key measure of kidney function. | Yes | Gold standard for assessing kidney function. |
| Sodium | Sodium level imbalance can be associated with kidney issues. | No | May not provide additional insight beyond other selected markers. |
| Potassium | Potassium level imbalance can be caused by kidney problems. | No | While important for kidney function, other selected features may be more informative. |
| Haemoglobin | Hemoglobin level can be affected by CKD-related anemia. | Yes | Important for assessing anemia, a common CKD complication. |
| Packed Cell Volume | Packed cell volume (red blood cell | Yes | Provides additional context to hemoglobin levels for anemia assessment. |

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| | concentration) can be impacted by CKD anemia. | | |
| White Blood Cell Count | White blood cell count can indicate infection, potentially affecting kidneys. | Yes | May indicate underlying inflammation or infection affecting kidneys. |
| Red Blood Cell Count | Red blood cell count can be affected by CKD anemia. | No | Hemoglobin and packed cell volume likely provide sufficient information about red blood cells. |
| Hypertension | Existing hypertension diagnosis is a major CKD risk factor. | Yes | Major risk factor for CKD development and progression. |
| Diabetes Mellitus | Existing diabetes mellitus diagnosis is a major CKD risk factor. | No | Blood glucose and sugar measurements may provide more direct, quantitative information. |
| Coronary Artery Disease | Existing coronary artery disease diagnosis might be linked to CKD. | No | While related to overall health, may not be as directly relevant to CKD as other factors. |
| Appetite | Appetite loss can be a symptom of CKD. | No | Subjective measure that may not reliably indicate early-stage CKD. |

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| Pedal Edema | Pedal edema (swelling in feet) can be a sign of kidney problems. | No | Can be caused by various factors, not specific enough for early CKD detection. |
| Anemia | Existing anemia diagnosis can be caused by or contribute to CKD. | No | Hemoglobin and packed cell volume measurements provide more direct anemia assessment. |
| Class | The target variable indicating presence or absence of CKD. | No | This is the target variable to be predicted, not a predictive feature itself. |