**Project Initialization and Planning Phase**

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| Date | 25 June 2025 |
| Team ID | SWTID1749753590 |
| Project Title | Early Prediction for Chronic Kidney Disease Detection: A Progressive Approach to Health Management |
| Maximum Marks | 3 Marks |

**Project Proposal (Proposed Solution) template**

This project proposal outlines a solution to address a specific problem. With a clear objective, defined scope, and a concise problem statement, the proposed solution details the approach, key features, and resource requirements, including hardware, software, and personnel.

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| **Project Overview** | |
| Objective | To develop a machine learning-based web application that can predict the presence of Chronic Kidney Disease (CKD) using clinical and laboratory data for early intervention. |
| Scope | The project focuses on developing a binary classification model for CKD detection using historical clinical data. It includes data preprocessing, model building, evaluation, and deploying the best-performing model via a Flask-based web app. The tool targets healthcare professionals and general users to support early-stage detection |
| **Problem Statement** | |
| Description | CKD often goes undiagnosed in early stages due to lack of symptoms and costly testing procedures. This delays treatment and increases the risk of kidney failure. |
| Impact | Early detection through machine learning enables timely intervention, improves patient outcomes, reduces healthcare costs, and supports better management of chronic diseases. |
| **Proposed Solution** | |
| Approach | Preprocess clinical data, perform EDA, apply multiple ML algorithms (Logistic Regression, Decision Tree), evaluate models, select the best-performing one, and deploy it using Flask with a simple UI for real-time predictions. |
| Key Features | - Accurate prediction (98.75% accuracy)  - User-friendly web interface  - Lightweight model using Logistic Regression  - Easily accessible via local server  - Uses only basic clinical inputs for prediction |

**Resource Requirements**

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| **Resource Type** | **Description** | **Specification/Allocation** |
| **Hardware** | | |
| Computing Resources | CPU/GPU specifications, number of cores | Standard laptop/PC with 4 cores (Intel i5 or equivalent) |
| Memory | RAM specifications | 8 GB |
| Storage | Disk space for data, models, and logs | 1 TB SSD |
| **Software** | | |
| Frameworks | Python frameworks | Flask |
| Libraries | Additional libraries | scikit-learn, pandas, numpy |
| Development Environment | IDE, version control | Jupyter Notebook, Vscode , Git |
| **Data** | | |
| Data | Source, size, format | Kaggle dataset, 178 kb |