# Title: Diabetes Detection System - System Requirements Specification

## 1. Introduction

### 1.1 Purpose
The purpose of this document is to specify the requirements for the development of the Diabetes Detection System. The system aims to predict the likelihood of an individual having diabetes based on their medical information.

### 1.2 Scope
The Diabetes Detection System will include the implementation of the Naive Bayes and Decision Tree algorithms for diabetes classification. The system will collect and preprocess the diabetes dataset, train the models using the dataset, evaluate the model performance, and integrate the models into a software application.

### 1.3 Definitions, Acronyms, and Abbreviations
- TBD (To Be Determined)

### 1.4 References
- TBD

## 2. Overall Description

### 2.1 Product Perspective
The Diabetes Detection System will be a standalone software application that operates independently of other systems. It will provide a user-friendly interface for users to input their medical information and receive predictions about their likelihood of having diabetes.

### 2.2 Product Features
The Diabetes Detection System will include the following features:

#### 2.2.1 Data Collection and Preprocessing:
- Import the diabetes dataset in a suitable format.
- Perform data cleaning, normalization, and handling missing values.

#### 2.2.2 Naive Bayes Algorithm:
- Implement the Naive Bayes algorithm for diabetes classification.
- Train the Naive Bayes model using the preprocessed dataset.

#### 2.2.3 Decision Tree Algorithm:
- Implement the Decision Tree algorithm for diabetes classification.
- Train the Decision Tree model using the preprocessed dataset.

2.2.4 Model Evaluation:
- Evaluate the performance of the Naive Bayes and Decision Tree models using evaluation metrics such as accuracy, precision, recall, and F1 score.

2.2.5 Integration:
- Integrate the trained models into a software application.
- Provide an interface for users to input their medical information and receive diabetes predictions.

2.3 User Classes and Characteristics
The Diabetes Detection System will primarily serve the following user class:
- General Users: Individuals who want to check whether they are likely to have diabetes based on their medical information.

2.4 Operating Environment
The Diabetes Detection System will operate on the following environment:
- Operating System: [Specify the targeted operating system(s) and version(s)]
- Programming Language: [Specify the programming language(s) and version(s)]
- Libraries and Frameworks: [Specify any specific libraries or frameworks required for the project]

2.5 Design and Implementation Constraints
The Diabetes Detection System will adhere to the following design and implementation constraints:
- The system should provide a user-friendly interface for inputting medical information and receiving predictions.
- The Naive Bayes and Decision Tree algorithms should be implemented using appropriate libraries or frameworks.
- The system should handle missing values and ensure data integrity.

2.6 User Documentation
User documentation will be provided alongside the software application. It will include instructions on how to use the application, input medical information, and interpret the diabetes predictions.

2.7 Assumptions and Dependencies
The Diabetes Detection System assumes the following:
- Availability of the diabetes dataset for training and evaluation.
- Access to necessary computing resources (e.g., hardware, software) to develop and run the system.

3. External Interface Requirements

3.1 User Interfaces

- The user interface of the software application shall be intuitive and easy to use.
- The system shall provide clear and understandable instructions for users on how to input their medical information.

3.2 Hardware Interfaces
- TBD

3.3 Software Interfaces
- TBD

3.4 Communications Interfaces
- TBD

4. System Features

4.1 Data Collection and Preprocessing
4.1.1 Description and Priority
This feature involves collecting