***Software Requirement Document***

***for***

***Machine Learning in Diabetes***

***Version 0.01***

***Prepared By***

***Donna R***

# Table of Contents

1. OBJECTIVES AND SCOPE
2. INTENDED AUDIENCE
3. DEFINITIONS, ACRONYMS AND ABBREVIATIONS
4. REFERENCES
5. REQUIREMENTS OVERVIEW
   1. Project Perspective
   2. Project functions
   3. Operating Environment
   4. Customer enforced technology choices
   5. User Documentation
   6. Assumptions ,dependencies and external risks
6. EXTERNAL INTERFACE REQUIREMENTS
   1. Hardware interfaces
   2. Software interfaces
7. FUNCTIONAL REQUIREMENTS
   1. Data Preprocessing
   2. ML Model Training
   3. Diabetes Prediction
   4. Reporting
8. PERFORMANCE REQUIREMENTS
9. ACCEPTANCE REQUIREMENTS
10. MAINTAINABILITY REQUIREMENTS
11. OTHER REQUIREMENTS
    1. Portability Requirements
    2. Reliability requirements
    3. Scalability requirements
12. OPEN ISSUES

***1. Objectives and Scope***

TThe purpose of this Software Requirements Specification (SRS) document is to outline the requirements and specifications for a Diabetes Prediction System. The system will utilize Machine Learning (ML) algorithms to predict the likelihood of a person developing diabetes based on blood pressure and glucose levels. The data will be taken from a provided CSV file.

***2. Intended Audience***

This document is intended for the development team, stakeholders, and anyone involved in the design, development, and testing of the Diabetes Prediction System

***3. Definitions, Acronyms, and Abbreviations***

SRS: Software Requirements Specification

ML: Machine Learning

***4. References***

CSV file containing patient data

***5. Requirements Overview***

The Diabetes Prediction System aims to develop a machine learning program that predicts whether a patient has diabetes or not based on input blood pressure and glucose levels.

**5.1 Project Perspective**

The Diabetes Prediction System is a standalone program that will process data from a CSV file and generate predictions using ML algorithms.

**5.2 Project Functions**

The key functions of the Diabetes Prediction System include:

* *Data Preprocessing*: Clean, normalize, and handle missing values in the input data from the CSV file.
* *ML Model Training*: Implement and evaluate ML algorithms to train a diabetes prediction model using a training dataset.
* *Diabetes Prediction*: Provide prediction functionality to determine the likelihood of a patient developing diabetes based on input data.
* *Reporting and Visualization*: Generate reports and visualizations to present prediction results to healthcare professionals.

**5.3 Operating Environment**

The Diabetes Prediction System will operate on a suitable computing environment with Python and necessary ML libraries installed.

**5.4 Customer Enforced Technology Choices**

The system shall be developed using Python for ML algorithm implementation.

**5.5 User Documentation**

The Diabetes Prediction System shall provide user documentation, including user guides and tutorials, to assist users in utilizing the system effectively.

**5.6 Assumptions, Dependencies, and External Risks**

The availability and quality of the CSV file containing patient data are dependencies for accurate predictions.

The ML algorithms used depend on the quality and representativeness of the dataset.

***6. External Interface Requirements***

**6.1 Hardware Interfaces**

The Diabetes Prediction System does not have any specific hardware interface requirements. It should be accessible through standard computing devices such as desktop computers, laptops, or tablets.

**6.2 Software Interfaces**

* ML Libraries: The system shall utilize ML libraries like scikit-learn for implementing ML algorithms.

***7. Functional Requirements***

**7.1 Data Preprocessing**

The Data Preprocessing module shall perform the following tasks:

● Read Data: Read the patient data from the provided CSV file.

● Data Cleaning: Clean the data by handling missing values appropriately.

● Data Normalization: Normalize the data to ensure compatibility with ML algorithms.

**7.2 ML Model Training**

The ML Model Training module shall perform the following tasks:

● Split Data: Split the dataset into training and testing sets.

● Implement ML Algorithms: Implement suitable ML algorithms, such as logistic regression or random forest, for training the diabetes prediction model.

● Evaluate Model: Evaluate the trained model using appropriate evaluation metrics, such as accuracy or F1 score.

**7.3 Diabetes Prediction**

The Diabetes Prediction module shall perform the following task:

● Predict Diabetes: Utilize the trained model to predict whether a patient has diabetes or not based on input blood pressure and glucose levels.

**7.4 Reporting**

The Reporting module shall generate reports to present the prediction results.



***8. Performance Requirements***

The Diabetes Prediction System shall provide accurate predictions within a reasonable timeframe.

***9. Acceptance Requirements***

The acceptance criteria for the Diabetes Prediction System shall include the following:

* The system should accurately predict the likelihood of a patient developing diabetes based on input data.
* The system should generate reports and visualizations that effectively present prediction results to healthcare professionals.

***10. Maintainability Requirements***

The Diabetes Prediction System should be designed and developed in a modular and maintainable manner to facilitate future enhancements, bug fixes, and updates. The codebase should be well-documented, and appropriate version control practices should be followed.

***11. Other Requirements***

**11.1 Portability Requirements**

The Diabetes Prediction System should be platform-independent and compatible with various operating systems.

**11.2 Reliability Requirements**

The system should be reliable and available for use when needed.

**11.3 Scalability Requirements**

The system should be designed to handle a large volume of patient data.

***12. Open Issues***

This concludes the modified version of the Software Requirements Specification (SRS) document for the Diabetes Prediction System. The document covers the functional and non-functional requirements of the system, along with its constraints, assumptions, and dependencies.