Software Requirements Specification

for

Heart attack classification system

Version draft

Prepared by

Group Name: group 111

|  |  |  |
| --- | --- | --- |
| Ankur Kumar Muduli | 1RVU22CSE028 | ankurkm.btech22@rvu.edu.in |
| Dyuthi Ramesh | 1RVU22CSE052 | dyuthir.btech22@rvu.edu.in |
| Maithili K Hebbar | 1RVU22CSE098 | maithilikh.btech22@rvu.edu.in |
| Sushan Rai | 1RVU22CSE173 | sushanr.btech22@rvu.edu.in |
| Venkatesh Vijayraj Ankola | 1RVU22CSE188 | venkateshva.btech22@rvu.edu.in |
|  |
|  |  |  |

|  |  |
| --- | --- |
| Instructor: | CVSN Reddy |
| Course: | Agile software |
| Lab Section: | *C* |
| Teaching Assistant: | Divya |
| Date: | 4th October 2023 |

Contents

Contents ii

Revisions ii

1 Introduction 1

1.1 Document Purpose 1

1.2 Product Scope 1

1.3 Intended Audience and Document Overview 1

1.4 Definitions, Acronyms and Abbreviations 1

1.5 Document Conventions 1

1.6 References and Acknowledgments 2

2 Overall Description 2

2.1 Product Overview 2

2.2 Product Functionality 3

2.3 Design and Implementation Constraints 3

2.4 Assumptions and Dependencies 3

3 Specific Requirements 4

3.1 External Interface Requirements 4

3.2 Functional Requirements 4

3.3 Use Case Model 5

4 Other Non-functional Requirements 6

4.1 Performance Requirements 6

4.2 Safety and Security Requirements 6

4.3 Software Quality Attributes 6

5 Other Requirements 7

Appendix A – Data Dictionary 8

Appendix B - Group Log 9

Revisions

| Version | Primary Author(s) | Description of Version | Date Completed |
| --- | --- | --- | --- |
| Draft Type and Number | Full Name | Information about the revision. This table does not need to be filled in whenever a document is touched, only when the version is being upgraded. | 00/00/00 |

# 

# Introduction

## Document Purpose

The purpose of this Software Requirements Specification (SRS) document is to provide a comprehensive overview of the Heart Attack Classification System, which employs both Machine Learning (ML) and Deep Learning (DL) techniques. This document outlines the system's features, functionalities, and detailed requirements.

## Product Scope

The scope of this SRS covers the specifications, design, and development of a software system capable of predicting the likelihood of heart attacks based on medical data using ML and DL models.

## Intended Audience and Document Overview

- Data Scientists and Machine Learning Engineers need this document for model development.

- Testers need this document to write test plans and evaluate model performance.

- Project Managers need this document for project planning.

- Healthcare professionals may use this system for predicting heart attacks.

## Definitions, Acronyms and Abbreviations

- SRS: Software Requirement Specifications

- ML: Machine Learning

- DL: Deep Learning

## Document Conventions

N/A

## References and Acknowledgments

- "heart.csv" dataset

- Machine learning and deep learning code implementation

# Overall Description

## Product Overview

This product aims to develop machine learning and deep learning models for classifying heart attacks based on patient data.

## Product Functionality

The system includes the following modules:

- Machine Learning Models (Decision Tree, Random Forest, SVM, Logistic Regression, KNN, Naive Bayes)

- Deep Neural Network

## Design and Implementation Constraints

- Machine learning algorithms and deep learning architectures will be employed.

- Model training and evaluation will depend on available hardware resources.

- Python programming language and libraries such as scikit-learn and Keras will be used.

## Assumptions and Dependencies

- The "heart.csv" dataset contains accurate and relevant data.

- The code implementations provided are accurate and functional.

# Specific Requirements

## External Interface Requirements

## User Interfaces

N/A

## Hardware Interfaces

N/A

## Software Interfaces

N/A

## Functional Requirements

The system shall include the following machine learning and deep learning models:

1. Decision Tree Classifier for Heart Attack Prediction

2. Random Forest Classifier for Heart Attack Prediction

3. Support Vector Machine (SVM) Classifier for Heart Attack Prediction

4. Logistic Regression Classifier for Heart Attack Prediction

5. k-Nearest Neighbours (KNN) Classifier for Heart Attack Prediction

6. Naive Bayes Classifier for Heart Attack Prediction

7. Deep Neural Network (DNN) for Heart Attack Prediction

## Use Case Model

N/A

# Other Non-functional Requirements

## Performance Requirements

- The machine learning models and DNN should achieve a minimum accuracy of 90% in predicting heart attacks.

- Model training and prediction times should be reasonable for real-world applications.

## Safety and Security Requirements

- Data privacy and security measures should be in place to protect patient information.

## Software Quality Attributes

1. \*Reliability:\* The models should provide consistent and reliable predictions.

2. \*Accuracy:\* The models should have high accuracy in heart attack prediction.

3. \*Maintainability:\* Code should be well-documented and maintainable for future updates.

This SRS document outlines the requirements for developing and evaluating machine learning and deep learning models for heart attack prediction based on the "heart.csv" dataset and associated code implementations

# Other Requirements

N/A

Appendix A – Data Dictionary

*<Data dictionary is used to track all the different variables, states and functional requirements that you described in your document. Make sure to include the complete list of all constants, state variables (and their possible states), inputs and outputs in a table. In the table, include the description of these items as well as all related operations and requirements.>*

Appendix B - Group Log

<Please include here all the minutes from your group meetings, your group activities, and any other relevant information that will assist in determining the effort put forth to produce this document>