Software Requirements Specification

for

Prediction of Heart Attack

Version <1.0>

Prepared by Likhith S

Group Name: BTech Section C

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| Date: | 06 October 2023 |

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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 |

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# Introduction

## Document Purpose

* The purpose of this document is to capture functional requirements of the project from the customer.
* This document will be used by system test team for the purpose of writing test cases, test scripts, test plan and test script automation.
* This document will be used by the project manager for making project plan, project schedule and project cast.

## Product Scope

* The project scope involves developing a machine learning model to better predict the occurrence of a heart attack. The project involves Machine learning, Deep learning and databases.

## Intended Audience and Document Overview

* Customer, system tester, project manager, development group and devOps group

## Definitions, Acronyms and Abbreviations

* DL – deep learning
* ML – machine learning
* SRS- software requirements specification

## Document Conventions

In general this document follows the IEEE formatting requirements. Use Arial font size 11, or 12 throughout the document for text. Use italics for comments. Document text should be single spaced and maintain the 1” margins found in this template. For Section and Subsection titles please follow the template.

## References and Acknowledgments

SoW document that comes from the customer is the input to write this document.

# Overall Description

## Product Overview

* This product is called prediction of heart attack. It uses the existing patient data set which has factors such as age, cholesterol, etc. and the target value for that particular data which states the occurrence of heart attack.
* The product contains 4 modules – database, database driver, ml algorithms, and dl algorithms.
* The user basically gives the real-time data of the given health factors and the model will predict if a heart attack has occurred or not.

## Product Functionality

1. Provide a bulleted list of all the major functions of the system

* Develop ML model
* Tune the ML model
* Develop DL model
* Tune the DL model
* Give warning when heart attack is predicted

## Design and Implementation Constraints

* Size of dataset
* Accuracy

## Assumptions and Dependencies

* Quality of data

# Specific Requirements

## External Interface Requirements

Network interfaces

### User Interfaces

System interface

Data interface

### Hardware Interfaces

Hardware and Device interfaces

### Software Interfaces

Communication of ML/DL model between dataset and algorithms.

## Functional Requirements

### F1: The system shall …

* Heart attack dataset
* Develop ML model using the below algorithms

1. Decision Tree
2. Random Forest
3. SVM
4. Logistic Regression
5. KNN
6. Naïve Bayes

* Tune ML algorithms for maximum accuracy by changing training and test data size

### <Functional Requirement or Feature #2>

* Implement Heart attack using Deep Learning - Deep Neural network classification
* Tune this algorithm for maximum accuracy by changing following parameters

1. Number of neurons in each layer

2. Increasing Epochs

3. Increasing hidden layers

4. Changing activation functions

## Use Case Model

TO DO: Provide a use case diagram that will encapsulate the entire system and all actors.

### Use Case #1 (use case name and unique identifier – e.g. U1)

**Author –** Likhith S

**Purpose** – To predict heart attack

**Requirements Traceability –** Dataset of the factors involving occurrence of heart attack

**Priority** - High

**Preconditions** – Dataset to be acquired

**Post conditions** – Warning has to be given when heart attack is predicted

**Actors** – human, system, devices

**Extends –** None

**Flow of Events**

* 1. Basic Flow – Heart attack is predicted
  2. Alternative Flow – Warning is given if heart attack occurs
  3. Exceptions – No proper dataset

### Use Case #2

…

# Other Non-functional Requirements

## Performance Requirements

When the heart attack is predicted warning has to be given in an instant under 0.1 sec.

## Safety and Security Requirements

The data of the patients has to be secured.

## Software Quality Attributes

* Accuracy
* Reliability
* Scalability
* Performance
* Cost-efficiency
* Resilience

# Other Requirements

<This section is **Optional.** Define any other requirements not covered elsewhere in the SRS. This might include database requirements, internationalization requirements, legal requirements, reuse objectives for the project, and so on. Add any new sections that are pertinent to the project.>

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>