Introduction

Purpose:

This is a Software Requirement Specification (SRS) document that specifies the requirements for this software. This application is called Hemoglobin Predictor.

Scope:

The application will predict the hemoglobin levels for a patient based on his previous RBC counts. This application is targeted for doctors and other healthcare professionals.

Overall Description:

Product Perspective:

The healthcare industry is a abundant source of data. And if channelized well, this data can be used to create useful applications. This application aims of using that abundant data of a patient generated upon every lab visit.

Product Features:

Following are some of the features that this app plans to do:

- User input data
- Medical metrics prediction (e.g. hemoglobin levels)
- Data visualization

User characteristics:

This application is primarily intended for physicians or healthcare professionals, however any patient can also use it for personal uses in order to control their diet with respective body.

Functional Requirements:

User Stories:

1. Physicians can enter the data of a patient they are examining and then use prediction tool to predict next metric and then change the treatment as per the results.
2. Any individual patient can predict their progress based on the previous records and have an idea that whether their health will get better or not.

Use cases:

1. Prediction tool that is main feature of this app can be used to predict the outcome of future as per their previous history.
2. Data visualization can be used to show the overall progress of any individual over the time.

Input and Output Specifications:

The input of this application would be the data that will be used to train the machine learning model. This input data will be given in form of a pdf file. The model trained from this data will give us ability to predict the future outcomes as output. Also, a data visualization can be displayed from this data, like a line chart.

Non-Functional Requirements:

Performance:

- The machine learning model used for hemoglobin prediction is currently **96% accurate** based on the training and testing dataset.
- The goal is to maintain or improve this accuracy as more data is introduced over time.
- The system should provide predictions in real-time with minimal latency, typically within 1-2 seconds after data input.

Usability:

- The application should have a clean and intuitive interface that allows healthcare professionals and patients to input data easily.
- It should provide clear, actionable predictions about patient's hemoglobin.

System Requirements:

Hardware Requirements:

- Any modern computer or server capable of running Python, Flask, ReactJS, and Docker.
- For the development environment, at least 8GB of RAM, 4-core processor, and 10GB of disk space.
- In a production environment, the app should be hosted on cloud platforms like AWS, GCP, or Azure with autoscaling capabilities for high-traffic scenarios.

Software Requirements:

- **Backend:** Python with Flask
- **Machine Learning:** SciKit-Learn or TensorFlow
- **Frontend:** ReactJS