

AI Based Diabetes Prediction System

PROBLEM STATEMENT:

Develop an AI-powered diabetes prediction system that leverages machine learning algorithms to analyze medical data and predict the likelihood of an individual developing diabetes, providing early risk assessment and personalized preventive measures.

PROBLEM DEFINITION:

The problem is to build an AI-powered diabetes prediction system that uses machine learning algorithms to analyze medical data and predict the likelihood of an individual developing diabetes. The system aims to provide early risk assessment and personalized preventive measures, allowing individuals to take proactive actions to manage their health.

ABOUT DIABETES:

Diabetes, is a group of metabolic disorders in which there are high blood sugar levels over a prolonged period. Symptoms of high blood sugar include frequent urination, increased thirst, and increased hunger. If left untreated, diabetes can cause many complications. Acute complications can lead to death. It also cause cardiovascular disease, stroke, chronic kidney disease, foot ulcers, and damage to the eyes.

OBJECTIVE:

To build a machine learning model to accurately predict whether or not the patients in the dataset have diabetes or not.

DESIGN PROCESS:

❖ DATA COLLECTION:

- Collect the dataset from various sources that include the features: -
 - ◆ Online sources
 - ◆ Hospitals
 - ◆ Nationwide diabetes patient documentation
 - ◆ Regional epidemiological diabetes registers

❖ DATA PREPROCESSING:

- ◆ Remove or handle missing values and outliers to ensure data quality.
- ◆ Divide data into training, validation, and testing sets.

❖ FEATURE SELECTION:

- Glucose
- Blood Pressure
- Skin Thickness
- Insulin
- BMI
- Diabetes Pedigree Function
- Age
- Outcome

❖ MODEL SELECTION:

- The diabetes prediction system can be built by choosing the perfect libraries and machine learning models.
- That include any of them below:
 - Decision Trees
 - Random Forest
 - Gradient Boosting
 - Support Vector Machines (SVM)
 - k-Nearest Neighbors (k-NN)
 - Naive Bayes
 - Neural Networks

❖ EVALUATION:

- Testing the model and evaluating the results and accuracy of the model.

RESULT:

The diabetes prediction system thus created using the SVM or other machine learning model is tested and verified using datasets and can be used to predict whether one will get diabetes or not. It helps individual to take proactive actions to manage their health.