# AI BASED DIABETES PREDICTION SYSTEM

An AI-based diabetes prediction system utilizes artificia 
l intelligence and machine learning techniques to predict the likelihood of an individual developing diabetes in the future. Such a system can be valuable for early intervention, prevention, and management of diabetes. Here's how it typically works:

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**1 Data Collection**: The system collects a wide range of data from individuals. This data can include:

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- Personal information: Age, gender, family history of diabetes.
- Clinical data: Blood pressure, cholesterol levels, BMI (Body Mass Index), and other relevant health metrics.
- Lifestyle data: Diet, exercise habits, smoking, alcohol consumption, etc.
- Medical history: Previous diagnoses, medication usage, and more.

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**2 Data Preprocessing**: The collected data needs to be cleaned and prepared for analysis. This involves handling missing values, normalizing data, and converting it into a format suitable for machine learning algorithms.

**3 Feature Selection/Engineering**: Relevant features or variables that are strongly associated with diabetes risk are selected, and new features may be engineered from the existing data to improve prediction accuracy.

**4 Machine Learning Models**: Various machine learning algorithms are applied to the prepared dataset. Common algorithms include logistic regression, decision trees, random forests, support vector machines, and neural networks (deep learning). The choice of model depends on the dataset and the specific goals of the prediction system.

**5 Training the Model**: The model is trained on a portion of the dataset, using historical data to learn patterns and relationships between variables.

**6 Validation and Evaluation**: The system assesses the model's performance using metrics such as accuracy, precision, recall, F1-score, and ROC AUC (Receiver Operating Characteristic Area Under the Curve). This is done to ensure that the model is making accurate predictions.

**8 Deployment**: Once the model is validated and performs well, it can be deployed as a predictive tool. This could be a mobile app, a web-based tool, or integrated into an electronic health record system.

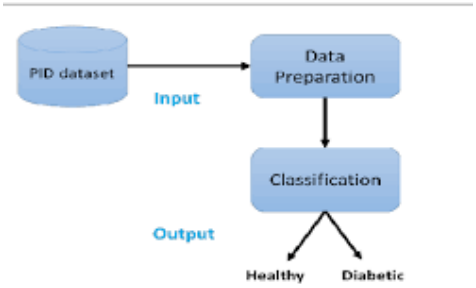
**9 Continuous Learning**: The system can be designed to continuously learn and adapt as new data becomes available. Regular updates can improve the model's accuracy and keep it up to date with the latest research findings.

**10 Patient Risk Assessment**: Individuals can input their data into the system, and it will provide a risk assessment of developing diabetes within a certain timeframe (e.g., 5 years). This information can be used for lifestyle modifications, early intervention, or discussions with healthcare professionals.

**11 Privacy and Security**: Handling sensitive health data requires strong privacy and security measures to protect individuals' information in compliance with data protection regulations.

It's important to note that while AI-based prediction systems can be valuable tools, they should not replace medical professionals' advice and diagnosis. Instead, they can assist healthcare providers in making more informed decisions and empower individuals to take proactive steps toward better health. Additionally, any AI system in the medical field should be developed and used ethically, with privacy and transparency as top priorities.

IMAGE :




CLASSIFICATION :

Logistic regression (LR) is used to identify the risk factors for diabetes disease based on p value and odds ratio (OR).

We have adopted four classifiers like naïve Bayes (NB), decision tree (DT), Adaboost (AB), and random forest (RF) to predict the diabetic patients.

## HEALTHY:

In this study, we developed a diabetes prediction system using a healthcare framework. The system employs various machine learning methods, such as K-nearest neighbors, decision tree, deep learning, SVM, random forest, AdaBoost and logistic regression.