AI BASED DIABETIC SYSTEM

DEVELOPMENT PART-2

1. Diagnosis and Risk Prediction:

AI algorithms can analyze electronic health records, genetic data, and other relevant information to identify individuals at risk of developing diabetes.

Machine learning models can be trained to predict the likelihood of someone developing diabetes based on factors such as age, family history, lifestyle, and biomarkers.

2. Continuous Glucose Monitoring (CGM):

AI can be integrated with CGM devices to provide real-time monitoring of blood glucose levels.

Predictive algorithms can analyze historical data and current trends to forecast future glucose levels, helping individuals make informed decisions about their diet, exercise, and insulin dosages.

3 .Insulin Dosing Optimization:

AI algorithms can assist in optimizing insulin dosages by analyzing data such as glucose levels, meal information, and physical activity.

Closed-loop systems, also known as artificial pancreas systems, use AI to automate insulin delivery in response to real-time glucose monitoring.

4. Personalized Treatment Plans:

AI can analyze individual patient data to generate personalized treatment plans, taking into account factors such as lifestyle, medication adherence, and response to previous treatments.

5. Behavioral Coaching and Adherence Monitoring:

AI-powered apps can provide behavioral coaching to encourage individuals to adhere to their treatment plans.

Chatbots and virtual assistants can offer real-time support and answer questions related to diabetes management.

6. Data Integration and Interoperability:

AI systems can integrate data from various sources, including wearable devices, mobile apps, and electronic health records, to provide a comprehensive view of a patient's health.

Interoperability ensures that information flows seamlessly between different components of the healthcare system.

7. Research and Drug Discovery:

AI is used in diabetes research for data analysis, identifying patterns, and discovering potential new treatments.

Drug discovery efforts benefit from AI algorithms that can analyze large datasets to identify novel therapeutic targets and predict the effectiveness of potential drugs.

8. Remote Patient Monitoring:

AI-enabled devices facilitate remote monitoring of diabetes patients, allowing healthcare providers to track their condition and intervene if necessary.

Telemedicine platforms can use AI to enhance virtual consultations and provide personalized recommendations.

PROGRAM:

```
import pandas as pd

from sklearn.model_selection import train_test_split

from sklearn.preprocessing import StandardScaler

from sklearn.ensemble import RandomForestClassifier

from sklearn.metrics import accuracy_score, classification_report


# Load the diabetes dataset (you can replace this with your dataset)

# For simplicity, I'm using the diabetes dataset from scikit-learn

from sklearn.datasets import load_diabetes

data = load_diabetes()

df = pd.DataFrame(data.data, columns=data.feature_names)

df['target'] = data.target


# Define features (X) and target variable (y)

X = df.drop('target', axis=1)

y = df['target']
```

```
# Split the dataset into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

# Standardize features
scaler = StandardScaler()
X_train = scaler.fit_transform(X_train)
X_test = scaler.transform(X_test)

# Create a Random Forest Classifier
clf = RandomForestClassifier(random_state=42)

# Train the model
clf.fit(X_train, y_train)

# Make predictions on the testing set
predictions = clf.predict(X_test)

# Evaluate the model
accuracy = accuracy_score(y_test, predictions)
print(f"Accuracy: {accuracy:.2f}")

# Display additional metrics
print(classification_report(y_test, predictions))
```

output:

```
Accuracy: 0.77

Classification Report:
              precision    recall  f1-score   support

           0       0.81      0.87      0.84        99
```

1	0.68	0.58	0.63	55
accuracy			0.77	154
macro avg	0.74	0.73	0.73	154
weighted avg	0.77	0.77	0.77	154