

Continuous Glucose Monitoring & Insulin Injection System

This system uses **Internet of Things (IoT)** technology to **monitor glucose levels** and automatically trigger **insulin injections** when glucose is too high.

Overview

This project is designed to help **people with diabetes** monitor their glucose levels in real time. If the glucose level exceeds a safe limit, the system automatically sends an alert and simulates an insulin injection to help lower the glucose level.

The system works using:

- **ESP8266 Wi-Fi Module** to connect to the internet and send data.
- **Blynk IoT App** to display real-time glucose readings and receive alerts on your phone.

Components Needed

1. ESP8266 Wi-Fi Module

- This small device connects your glucose monitor to the internet and sends data to the **Blynk IoT App**. It acts as a bridge between the glucose sensor and the app.
- [Buy ESP8266 Module](#)

2. Blynk IoT App

- **Blynk** allows you to monitor real-time data and receive alerts directly on your mobile phone.
- **How it works:** You will see your glucose levels and be notified when the level exceeds the normal threshold.
- Download Blynk for your phone:
 - [Blynk for iOS](#)
 - [Blynk for Android](#)

3. Python Code (Glucose Monitor)

- The Python script simulates glucose readings and sends them to **Blynk**. It also triggers insulin injections if the glucose level goes above the threshold.
- **How it works:** The code continuously checks the glucose level and sends it to the app. If the glucose level is too high, the system will **simulate an insulin injection**.

Download and install **Python**:

- [Install Python](#)

4. Glucose Sensor (Simulated)

- We simulate glucose readings with random values for testing purposes.
- **Threshold for High Glucose:** If the glucose level exceeds **180 mg/dL**, the system will trigger an insulin injection.

How the System Works

1. **Glucose Reading:** The system simulates taking glucose readings every few seconds.
2. **Sending Data to Blynk:** These readings are sent to the **Blynk IoT App**, where you can see the values on your phone.
3. **High Glucose Alert:** If the glucose level exceeds **180 mg/dL**, the system sends an alert to your phone and triggers an **insulin injection** (simulated).
4. **Insulin Injection Simulation:** When high glucose is detected, the system simulates triggering an insulin injection to bring the glucose level back to normal.

Installation and Setup

Step 1: Install Required Software

- **Python:** You will need Python to run the code. Download it from [here](#).
- Install the **Requests** library to send data to Blynk:
- bash
- Copy
- pip install requests

Step 2: Set Up Blynk

- Create an account on **Blynk** and set up a new project.
- Get your **Blynk Auth Token** (a unique code used to send data to your Blynk app).

Step 3: Run the Python Script

- Download the Python code from the project.
- Replace the **Blynk Auth Token** in the script with your own token.
- Run the Python script:
- bash
- Copy
- python glucose_monitor.py

Step 4: Monitor the Data on Blynk

- Open the **Blynk App** on your phone.
- You'll see glucose levels updating in real time.
- If the glucose goes above 180 mg/dL, you'll receive an alert.

Links to Download Software and Components

- **Download Python:** [Python Official Website](#)
- **Download Blynk IoT App:**

- [iOS](#)
- [Android](#)
- **Buy ESP8266 Wi-Fi Module:** [Amazon ESP8266](#)

Conclusion

This system helps people with diabetes monitor their glucose levels using real-time data. With **ESP8266** and **Blynk IoT**, it's simple to set up and start monitoring. The Python code ensures that when glucose exceeds the safe limit, an alert is sent, and insulin is simulated to assist in reducing the levels.