

### The Problem

It is crucial to monitor cardiac health to assess an individual's well-being and ensure timely medical intervention. Regular heart health tracking can prevent severe health issues and improve quality of life. The high cost of commercially available pulse oximeters essential for this purpose makes them inaccessible to many individuals. This financial barrier prevents widespread and routine health monitoring, posing a significant public health challenge. Therefore, there is a pressing need for an affordable, reliable solution to monitor cardiac health, making it accessible to a broader population and promoting better health outcomes.

### The Solution

The development of an affordable pulse oximeter combined with an IoT mobile app has the potential to address this issue. This technology would make it easier and more affordable for people to monitor their cardiac health using their smartphones. By promoting the use of accessible technology for routine health monitoring, we can ultimately enhance health outcomes and reduce the likelihood of serious cardiac issues.

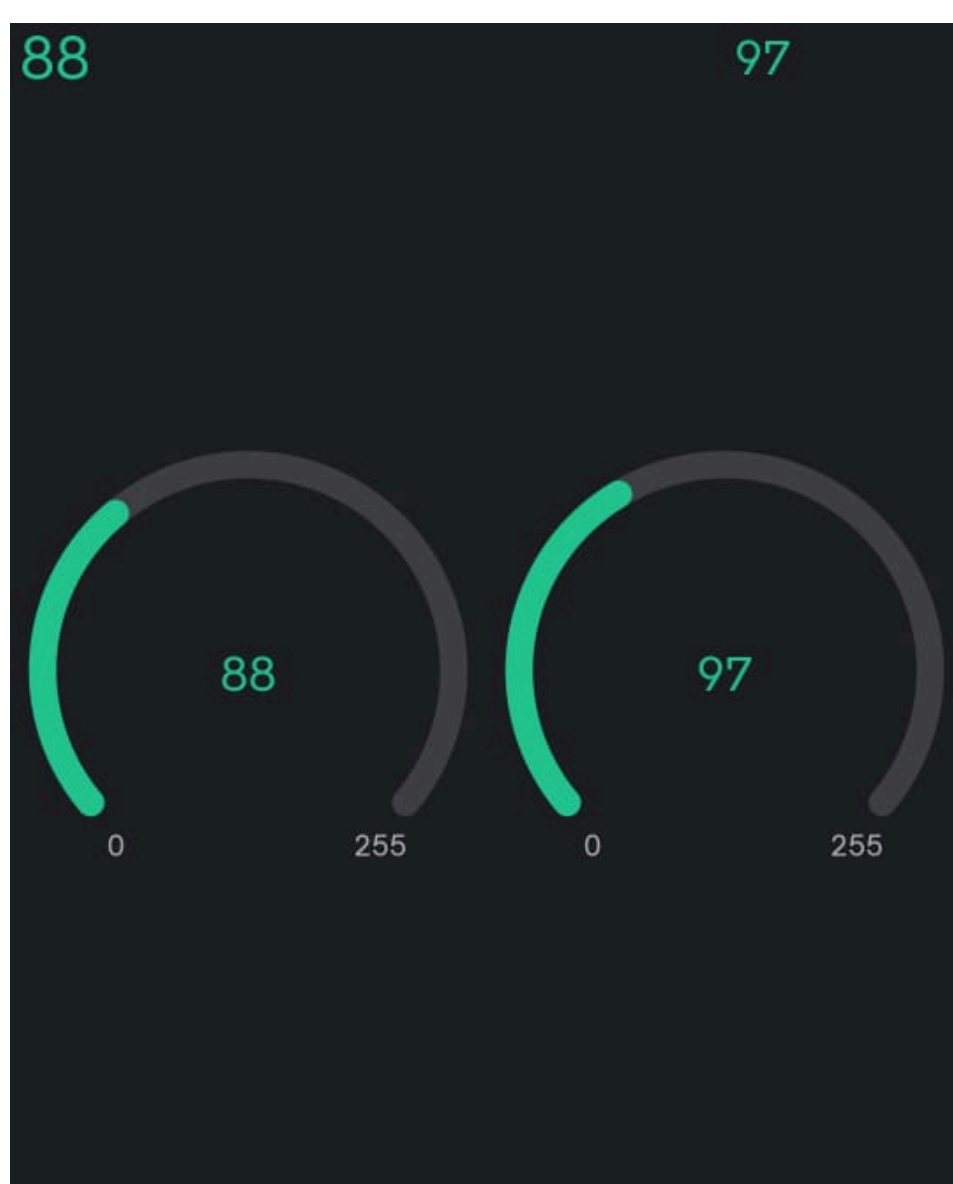


Fig .1. Blynk app

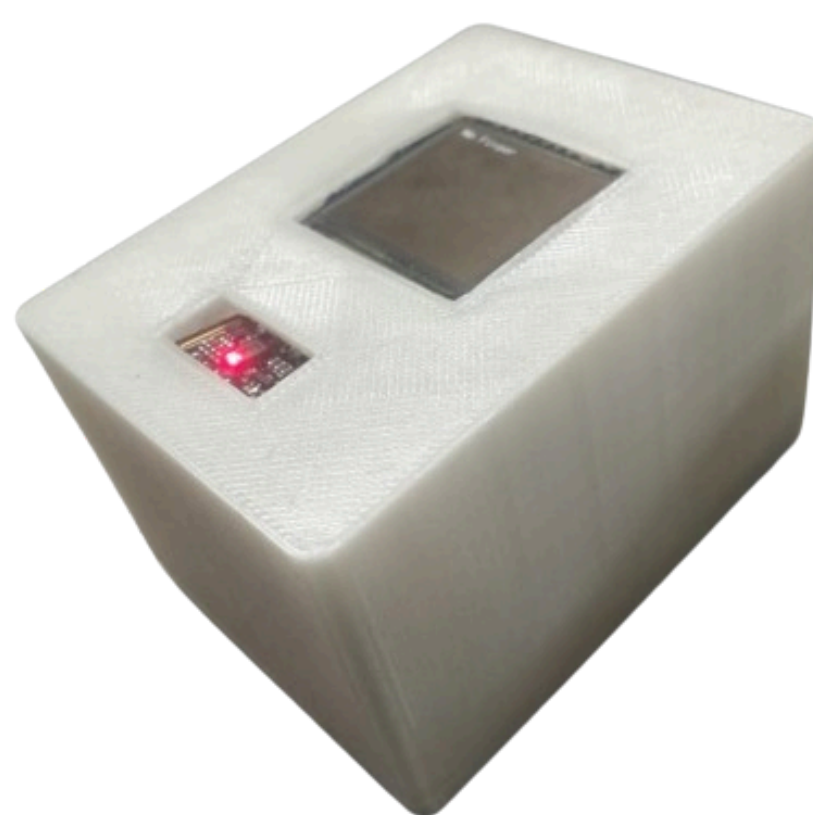


Fig .1.2. BP Reading device

Robo Lab Heart Care Centre			
Date : 25/09/2024 to 25/09/2024			
Date	Heart Rate (60-100)	SpO2 (94-100)	Temperature (36.6-37.2)
28/09/2024	74.00	95.00	18.00

Suggestion: Consult a doctor for further assessment.

Fig .1.3. Medical report

### Working Procedure

- The sensor labeled MAX30102 is designed to measure blood oxygen levels and pulse rate using red and infrared LEDs. The infrared LED detects the pulse rate by identifying variations in oxygenated blood volume with each heartbeat. In contrast, the absorption levels of both LEDs are analyzed to measure blood oxygen levels. The sensor then stores these absorption levels in an I2C-accessible buffer.
- One can set up the mobile application to monitor BPM (beats per minute) and SpO2 (blood oxygen saturation) over Wi-Fi using NodeMCU ESP8266. The mobile application is compatible with Android and iOS, allowing you to create a user interface for IoT applications.
- Heart rate and SpO2 data are uploaded to Google Sheets and Google World from that data, a medical report is generated for medical analysis.

### Applications

- **Remote Health Monitoring:** Using the MAX30102 sensor with NodeMCU ESP8266 and Blynk, patients can monitor their heart rate (BPM) and blood oxygen levels (SPO2) in real-time. Data can be accessed by healthcare providers remotely, enabling timely medical interventions.
- **Home Health Care:** Elderly or chronically ill patients can use the MAX30102 sensor to monitor vital signs at home. The data can be sent to family members or caregivers through the Blynk app, ensuring constant health monitoring and prompt response in case of abnormalities.
- **Telemedicine:** The MAX30102 sensor, NodeMCU ESP8266, and Blynk app can facilitate telemedicine by allowing patients to share their vital signs with doctors during virtual consultations. This enables doctors to make informed decisions based on real-time data without requiring an in-person visit.