

Minor End Term Report

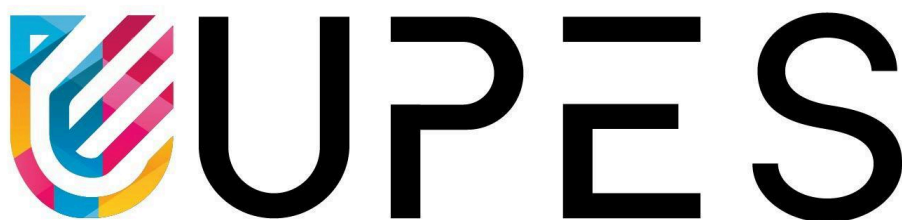
For

CareAI : An IoT based eHealthcare Advisor

2023

Prepared by

Specialization	SAP ID	Name
CCVT(H)	500083727	Bhoomika
CCVT(H)	500082951	Mani Paliwal
CCVT(H)	500085000	Nupur Sharma
CCVT(H)	500086703	Shikhar Nag



Department of Systemics
School Of Computer Science
UNIVERSITY OF PETROLEUM & ENERGY STUDIES,
DEHRADUN- 248007. Uttarakhand

Dr. Harvinder Singh
Dr. Bhupender Singh
Project Guide

Dr. Neelu J. Ahuja
Cluster Head

End Sem Report (2022-23)

1.) Project Title

CareAI: An IoT-based eHealthcare Advisor

2.) Abstract

Healthcare monitoring through a sensor kit involves non-invasive sensors that track a person's vital signs, such as pulse rate, oxygen level, and temperature, to detect any abnormalities. This technology can be integrated with a website or mobile application to provide real-time monitoring and analysis, enabling individuals to proactively manage their health and prevent potential health issues.

The healthcare monitoring website is a revolutionary platform that aims to provide users with the ability to monitor their health status in real-time using a sensor kit. The kit measures vital signs, such as oxygen level, temperature level, and pulse rate, and provides users with detailed insights into their overall health status.

The platform is designed to be user-friendly, allowing users to easily view their health data and track their progress over time. The website is also equipped with a Google Cloud Platform-integrated chatbot that can help users with any issues they may encounter.

The sensor kit uses advanced technology to provide accurate and reliable readings, ensuring that users can trust the information they receive about their health status. The website also offers personalized health recommendations based on users' individual health data, allowing them to make informed decisions about their lifestyle choices.

The chatbot integrated into the website is designed to be user-friendly and efficient, providing users with quick and easy access to information about their health status. The chatbot is powered by the Google Cloud Platform, which ensures that it is reliable and secure.

In addition to monitoring health status, the website also allows users to connect with healthcare professionals and other users who are on a similar health journey. This allows users to share their experiences and receive support from others who are facing similar challenges.

Overall, the healthcare monitoring website is an innovative platform that provides users with the tools they need to monitor their health status in real-time, make informed decisions about their lifestyle choices, and connect with others who are on a similar health journey. With its user-friendly design, advanced sensor kit technology, and Google Cloud Platform-integrated chatbot, the website is set to revolutionize the way users approach their health and well-being.

3.) Introduction

The medical services industry assumes a fundamental part not just in the actual soundness of individuals yet additionally in the economy all in all. While the medical services area is continually improving, a country like India with its developing populace generally falls short of

sufficient offices. India has a general medical care model that is generally directed at the state level rather than the government level, with each state having its own openly financed medical services. The Public well-being[2] strategy centers around the development of the powerful medical care industry. By and by, notwithstanding, the confidential medical services area is answerable for the greater part of medical services in India. Significant clinical experts are in metropolitan regions which simply cover a few pieces of India. The need for openness to country regions builds the dangers and decreases personal satisfaction. What's more, the expense of clinical treatment is high. Ordinary body tests, forward and backward clinics, and pre-and-post-hospitalization clinical costs all amount to a powerful sum that individuals can't bear. To change this multitude of negative marks, the full advantage of altering IoT in medical care is thought of. The Web of Things has made objects brilliant with next to no manual intercession. It lays out a stage that opens doors for individuals to interface gadgets and controls them with enormous information innovation. It is an ideal mixture of continuous investigation, remote organization sensors, and installed frameworks.

The platform is designed to be user-friendly, allowing users to easily view their health data and track their progress over time. The website is also equipped with a Google Cloud Platform-integrated chatbot that can help users with any issues they may encounter.

The sensor kit uses advanced technology to provide accurate and reliable readings, ensuring that users can trust the information they receive about their health status. The website also offers personalized health recommendations based on users' individual health data, allowing them to make informed decisions about their lifestyle choices.

The chatbot integrated into the website is designed to be user-friendly and efficient, providing users with quick and easy access to information about their health status. The chatbot is powered by the Google Cloud Platform, which ensures that it is reliable and secure.

There are endless benefits of IoT in medical services fields like using time productively, less use, and better and precise outcomes. Along these lines, every one of the shortcomings in the well-being area will diminish. With rising advances, information the executives likewise turn into a significant piece of the medical services framework. A great many information must be put away and this causes space intricacy in data sets. Here's where the cloud comes into the image. Not only does it help in storage with the help of MongoDB but the chatbot feature of GCP is highly interactive and easy to use. It is dependable, adaptable, and above all, it sticks to information from the executives and gives a rich examination.

4.) Literature Review

The [1] describes a healthcare monitoring system that combines the Internet of Things (IoT) and Artificial Intelligence (AI) to provide comprehensive health monitoring for individuals. The system consists of various sensors that can monitor various vital signs such as heart rate, blood pressure, and oxygen saturation levels. These sensors are connected to a central processing unit that collects and processes the data generated by the sensors.

The [2] presents a chatbot-based healthcare monitoring system that uses natural language processing (NLP) and machine learning (ML) techniques to provide personalized healthcare services. The authors describe the system's architecture, which includes a chatbot interface, an ML model, and a backend server.

The chatbot interface allows users to interact with the system using natural language, making it easy for individuals to communicate their health concerns and questions. The ML model analyzes the user's inputs and provides personalized responses based on the user's health history and other relevant factors. The backend server processes the data generated by the chatbot and ML model and stores it in a database for future use.

The [3] presents a healthcare monitoring system that utilizes the Internet of Things (IoT) technology to provide real-time health data monitoring for patients. The authors describe the architecture of the system, which includes various sensors and devices that can monitor various vital signs such as heart rate, blood pressure, and body temperature. The sensors and devices are connected to a central server via the internet.

The [4] provides a comprehensive overview of the Internet of Things (IoT) for health monitoring systems. The authors discuss the different components of an IoT-based healthcare monitoring system, including sensors, communication protocols, and cloud computing platforms. They also highlight the potential benefits of IoT-based healthcare monitoring, such as real-time health data monitoring, improved patient outcomes, and reduced healthcare costs. The paper concludes with a discussion of the challenges and future directions of IoT-based healthcare monitoring systems.

5.) Problem Statement

Traditional healthcare systems have been time-consuming and difficult to navigate, making it difficult for people to access medical professionals and timely treatment. Individuals often struggle to detect health vitals, leading to incorrect medication and health risks. A healthcare solution is required that provides comprehensive analysis and monitoring of the generic symptoms, especially for people in remote areas.

6.) Objectives

- To monitor the basic health parameters of the patient and check if there is any unusual behaviour or not.
- To provide an IoT-based remote Health care kit and AI Chatbot which provides health advice to patients.
- To generate alert emails of health status to help the patient stay focused on their unique health needs.

7.) Methodology

The Healthcare system in India suffers from three primary deficiencies: supply, utilization, and equipment. A key component of IoT in healthcare is the Healthcare kit. It makes record transmission and communication easier.

To use the kit, the patient must first register with the system.

After registration, the patient can then use the connected sensors to get their health parameters monitored.

The sensors used are

- o Max30100
- o LM35

- ➔ Now to access the website, the user must log in to the website.
- ➔ The user will then receive authentication from MongoDB cloud to get authorization for the website.
- ➔ With the use of a health kit, the three basic parameters i.e. oxygen level, body temperature and pulse rate are measured.
- ➔ This data from the health sensory kit is displayed on the Arduino's screen through the I2C(Inter-Integrated Circuit) protocol.
- ➔ The data is then fetched from here and sent to the web server through the use of HTTP(Hypertext Transfer Protocol) for the secure transfer of data.
- ➔ From here, if the average heartbeat is greater than 85 BPM, then the user will receive an alert mail with the heart rate value through the SMTP(Simple Mail Transfer Protocol).
- ➔ Furthermore, the website will include health blogs and a chatbot that will provide a self-assessment of mild symptoms.

IoT-BASED HEALTHCARE KIT

Our healthcare website is proud to incorporate cutting-edge technology that helps users monitor their health. One of the tools we use is a sensory kit that contains NodeMCU, LM35, and MAX30100 sensors. These sensors are essential in measuring vital signs such as body temperature, heart rate, and oxygen saturation levels.

The NodeMCU is a microcontroller that is used to connect the sensors to our website's server.

The LM35 is a temperature sensor that measures the ambient temperature in the room or the user's body temperature.

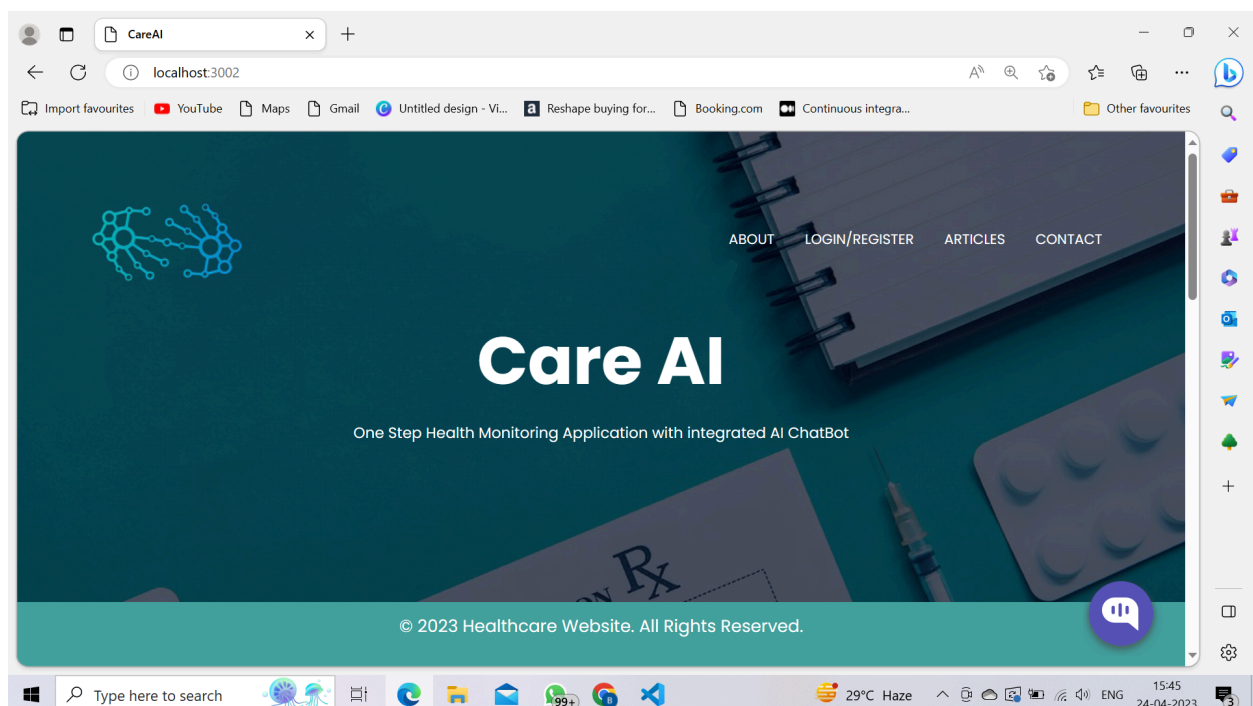
The MAX30100 is a pulse oximeter sensor that measures the user's heart rate and oxygen saturation levels.

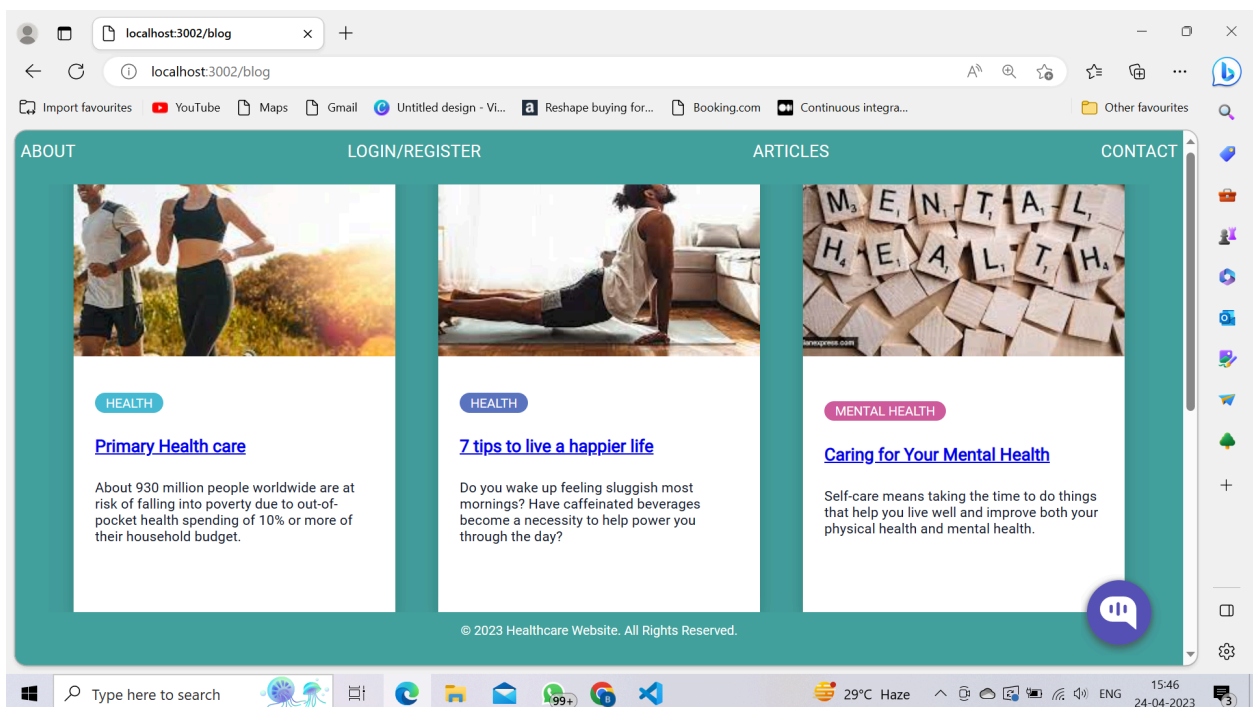
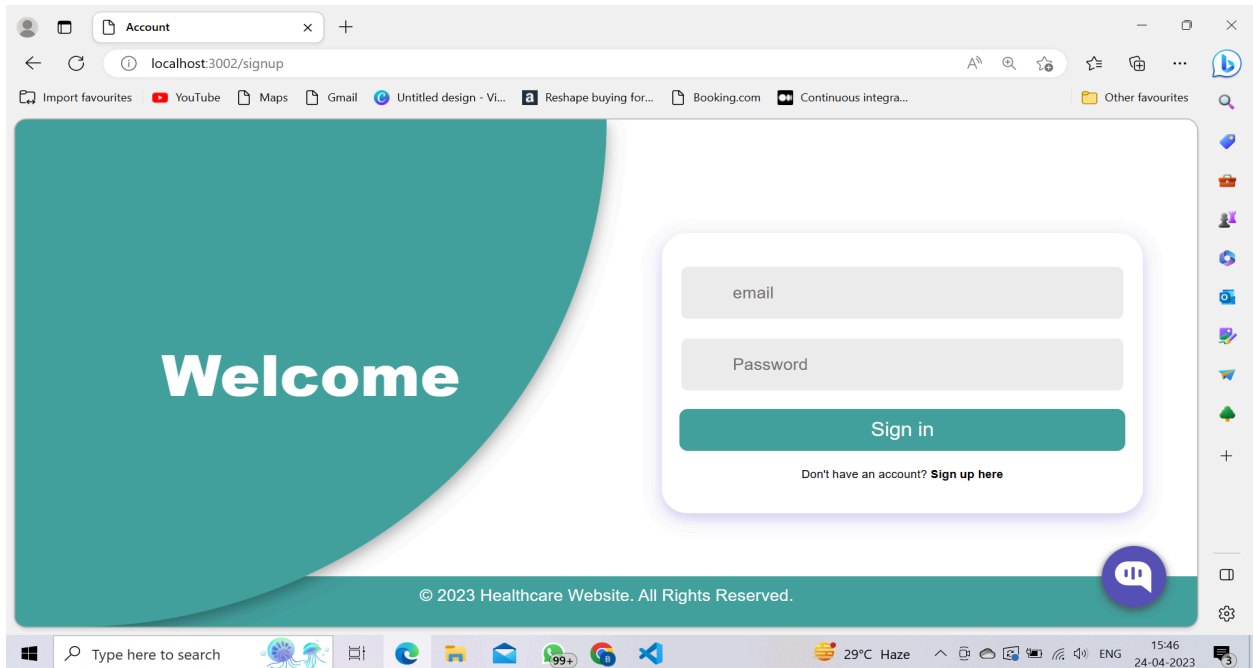
Our sensory kit provides accurate and reliable readings, which are then displayed on our website's dashboard. Users can monitor their vital signs over time and track any changes that may indicate a potential health problem. This allows them to take proactive steps to maintain their health and prevent any potential health issues from escalating.

HEALTH BOT

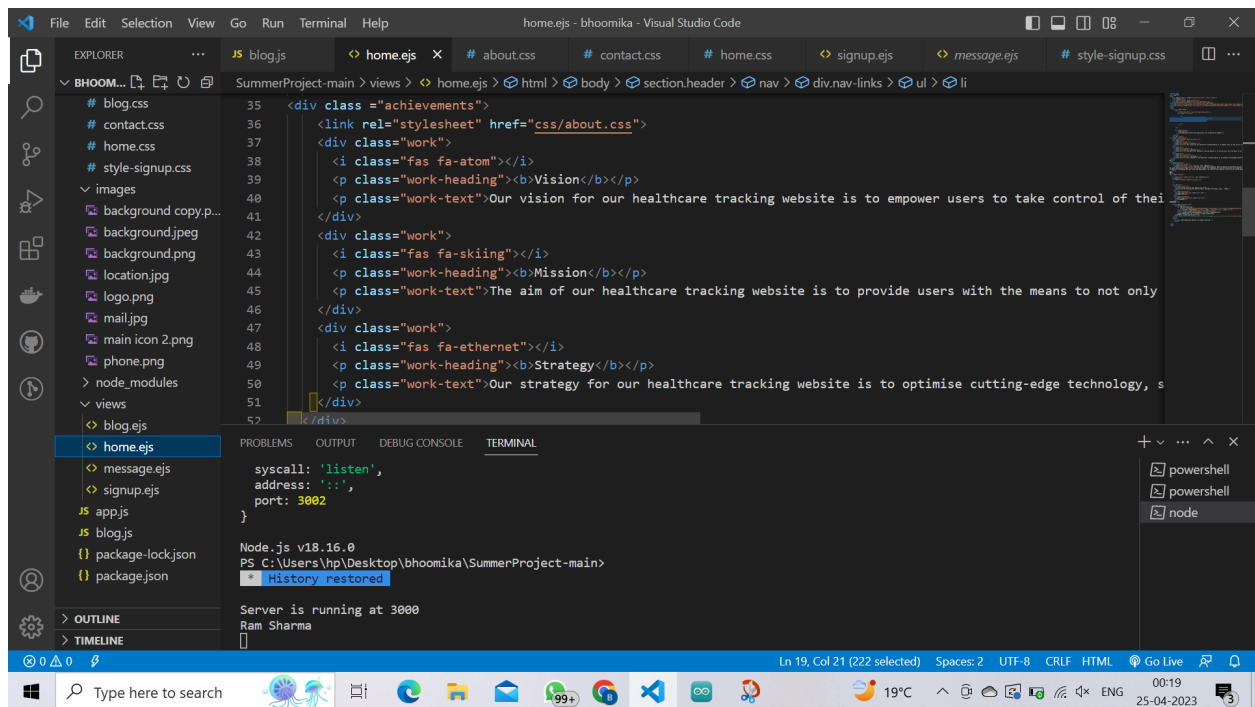
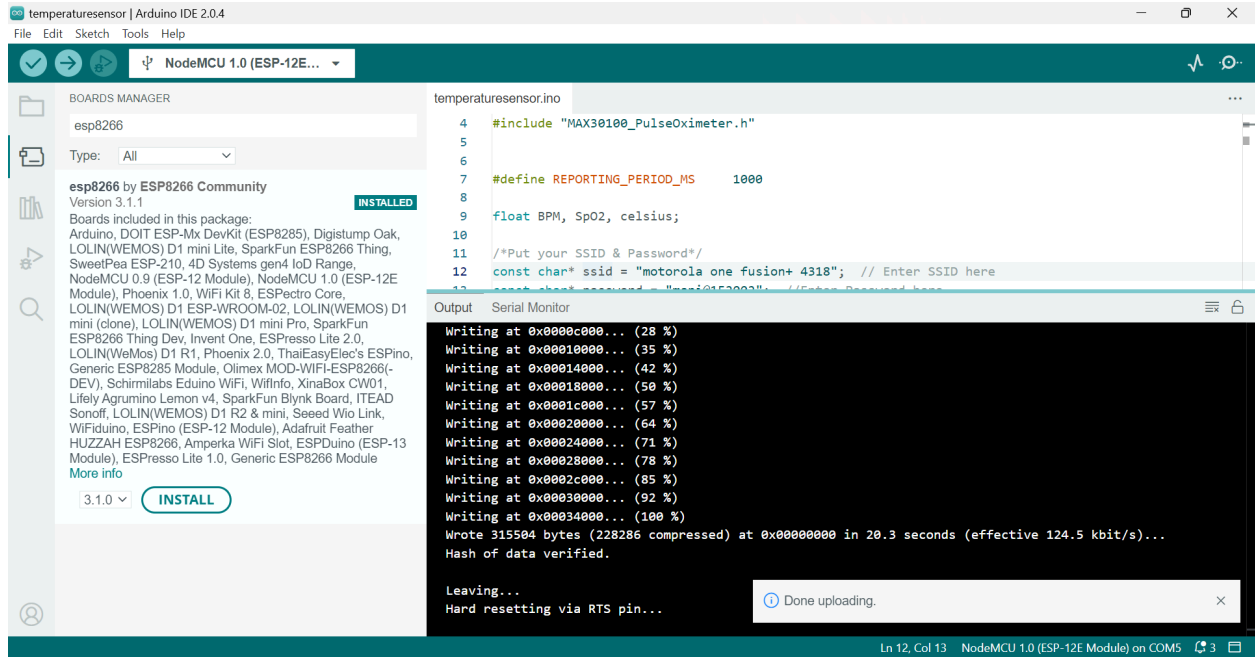
With the help of Dialog Flow, a like-life conversational AI to the websites, applications, messaging platforms, and contact center with an intuitive, advanced virtual agent, this project helps the users interact with the website much more easily. The chatbot uses intents and entities for implementing a smooth conversation and then leading to a final diagnosis by an effective text-based diagnostic technique.

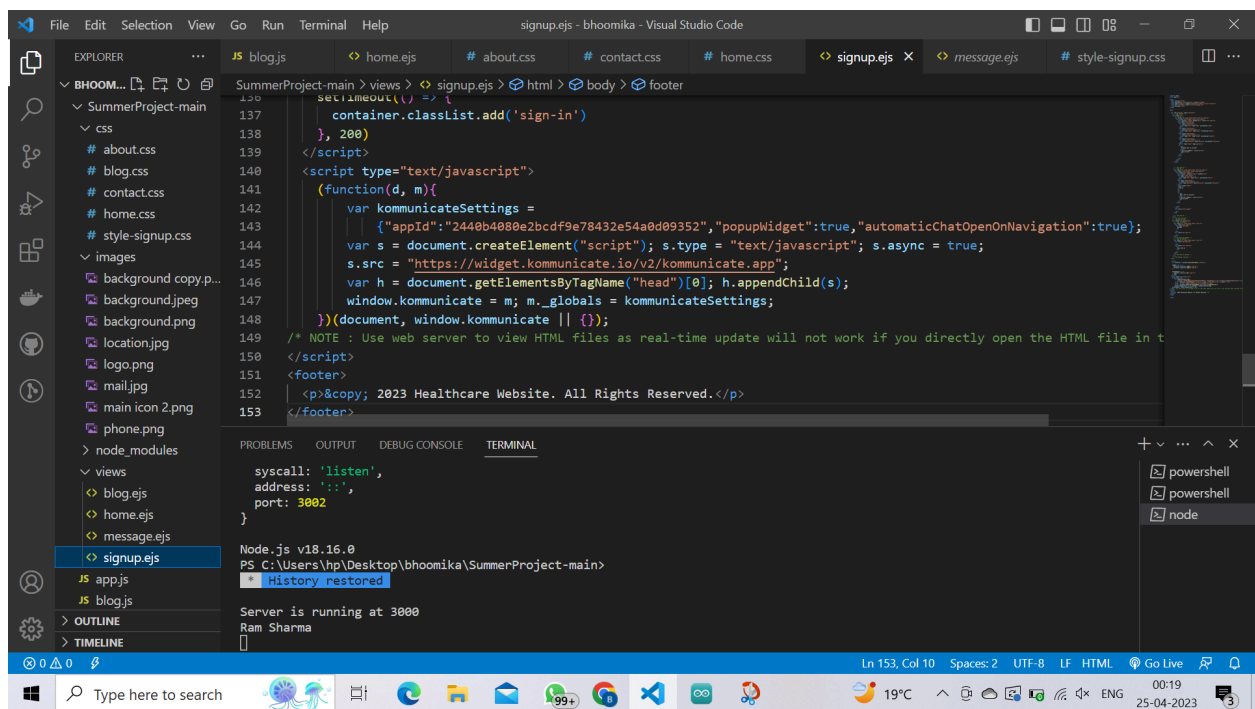
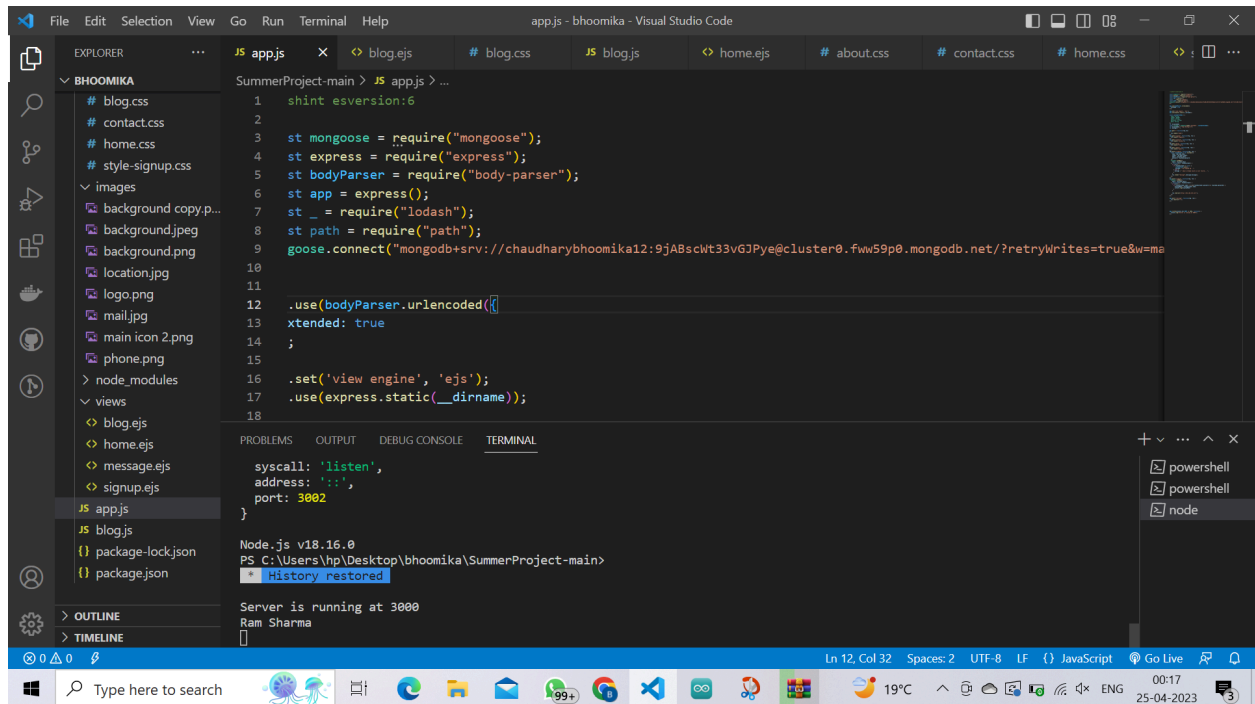
8.) Output Screenshot

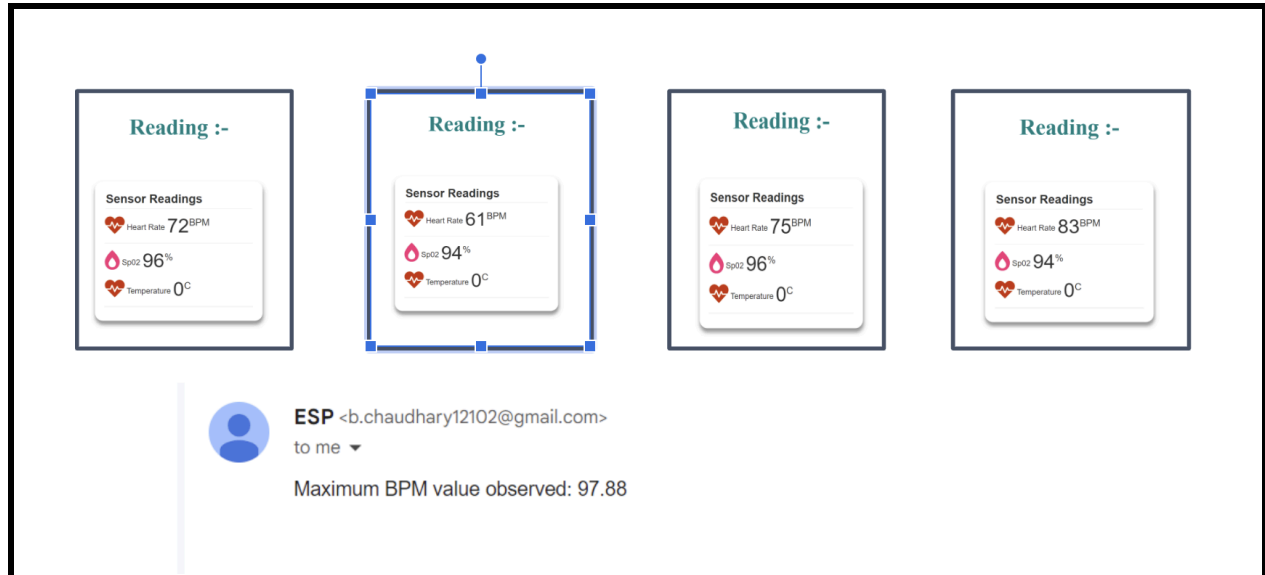




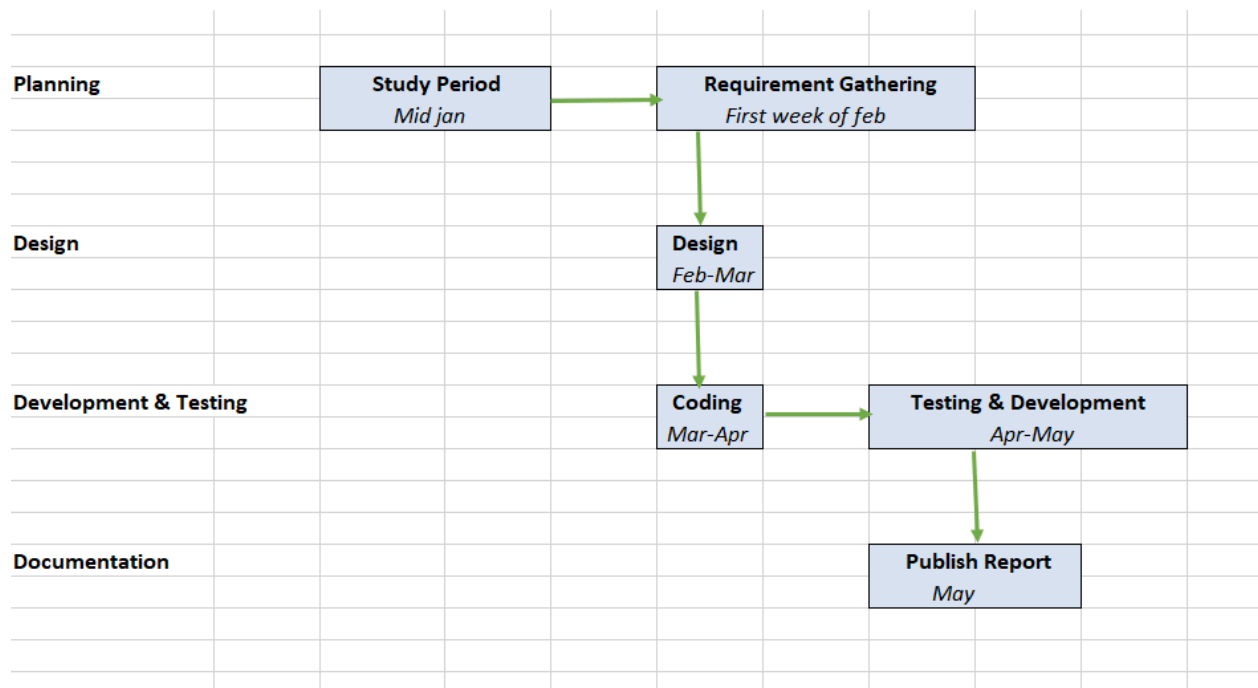
Code:







9.) PERT Chart:



10.) Conclusion

The proposed system provides healthcare solutions at any time and from any location. It will mostly benefit people who live in rural areas, as well as the old and disabled.

Our technology collects real-time medical information about a patient and stores it in the MongoDB cloud. It also aids in patient self-diagnosis by merging medical databases. This results in a better comprehension of medical terminology and a more personalized service for patients via our Healthbot. Our web application can contribute to generic accessibility to the masses as it can be used by rural people through mobile phones. We intend to provide virtual support to doctors, patients, and workers in order to improve and connect healthcare for society.

11.) References

- [1] S. Bhutada, A. Singh, K. Upadhyaya and P. Gaikar, "Ru-Urb IoT-AI powered Healthcare Kit," *2021 5th International Conference on Intelligent Computing and Control Systems (ICICCS)*, Madurai, India, 2021, pp. 417-422, doi: 10.1109/ICICCS51141.2021.9432257.
- [2] Katariya, Vivek & Vitthal, Shinde & Gutte, & Devare, Manoj. (2019). IntelligentHealthbotforTransformingHealthcare.
- [3] P. Gupta, D. Agrawal, J. Chhabra and P. K. Dhir, "IoT-based smart healthcare kit," *2016 International Conference on Computational Techniques in Information and Communication Technologies (ICCTICT)*, New Delhi, India, 2016, pp. 237-242, doi: 10.1109/ICCTICT.2016.7514585.
- [4] M. U. Ahmed, M. Björkman, A. Čaušević H. Fotouhi, and M. Lindén, "An overview on the internet of things for Health Monitoring Systems," SpringerLink, 01-Jan-1970. Available: https://link.springer.com/chapter/10.1007/978-3-319-47063-4_44.