CHAPTER: 1

INTRODUCTION

1.1 INTRODUCTION:

Alzheimer's disease is the most common form of dementia and may contribute to 60-70% of cases. Dementia is currently the seventh leading cause of death among all diseases and one of the major causes of disability and dependency among older people globally The most common severe risk can be when an individual who requires their walking aid forgets it when walking. The risk may increase drastically when the individual is suffering from Dementia or Alzheimer's. An elderly individual who is suffering from Dementia or Alzheimer's disease is most likely to be under the care of family or a home nurse in case individual is at their own residence. Growing prevalence of dementia presents a major challenge to global health at different levels. Hurd and colleagues estimated at the financial level that dementia and specifically, AD are among the diseases that are most expensive for the western region with a $160 billion per year. Alzheimer's is a kind of disease that typically and slowly progresses in three main stages such as early, middle and moderate or late.

This project provides easy assistance for Alzheimer patients. Provides alarm to remind the patient what work to do. Assistive technology is the term that is used to define systems or devices that enable individuals with physical or communication and cognitive disabilities to improve the quality and capabilities of their life. , advent of wearable technology in recent years has motivated and allowed professionals in the healthcare sector to look beyond the clinic or office to help in identifying and detecting health risks, tracking or monitoring the development of diseases, for instance, patient with Alzheimer Disease (AD)and offer therapy or guidance.

1.2 PROBLEM DEFINITION:

Dementia is currently the largest cause of death among all diseases and one of the major causes of disability and dependency among older people globally. Currently theirs no cure for the Alzheimer's disease and in order to avoid the growth of the disease within the patient, the only way to control it is, through proper medication. The medication involves regular check-up and regular intake of tablets. Since, the patient suffers from memory loss the patient needs a caretaker. It becomes a hectic job for caretaker to monitor the patient all the time.

CHAPTER: 2

LITERARTURE SURVEY

[1] Many healthcare patients are required to be assisted residential facilities because they cannot manage complex drug modalities without active support from nurses. In some cases, people need nothing more than occasional visits from a home nurse, some light housekeeping, meals on wheels, and visitors willing to talk and notify about pills. While there is a movement to make aging at home possible for more people, it is not always an option. Dementia and other illnesses can require around the clock medical care and monitoring, things often more easily given in a professional facility than at home. On the other end, increasing number of smart systems opens area where medical treatment can be utilized to completely new level. The designed system works on both physical reminders and digital reminders for patients, which is useful for all ages of people and specially for geriatric patients to take their pills. The designed system utilizes real time clock (RTC) module, LCD display, Arduino, buzzer system to intimidate the patient by taking the exact dose as prescribed at the mentioned time.

[2] Individuals who have memory disabilities often sometimes suffer with their inability to recognize loved ones and close friends. The proposed device is a wearable device specifically targeted to individuals with Alzheimer's disease, aiding their ability to recognize people using a face recognition model which matches the facial features of a person with stored pictures of known people. Along with face detection the proposed model also provides additional features such as GPS for tracking, alarms and music's of their choice in order to keep reminding their past. The device is implemented using Raspberry Pi 3. The Raspberry Pi used here has a BCM2837 ARM Cortex A53 Quad Core 1.2GHz processor and 1GB of RAM. The processor is paired with a Raspberry Pi Camera V2 with a resolution of 320x240 to capture images. The Pi-camera used in this system is a 5-megapixel spy camera.

[3] Taking care of elderly people is uneasy task, especially when they are diagnosed with Alzheimer's disease. They need a permanent and particular type of care. Therefore, Alzheimer's caregivers have huge burden on them. This project aims to get the benefit of the Internet of Things (IoT) concept along with a mobile application to facilitate Alzheimer's care giving and avoid burnout. The proposed solution basically focuses on services such as tracking the steps of the patient through GPS, medication, and food timing notifications through "ALZ Caretaker". The Mind Mate application and Balance: Alzheimer's Care giving both are applications that offer same services for Alzheimer's patients and their caregivers. The most important and common features are reminder list to organize

daily tasks, tips and notifications. Overall, the solution is proposed by means of an web application with involvement of IoT.

[4] Zeal College of Engineering and Research Alzheimer an unrepeatable and continuous growing brain disorder which can slowly demolish the memory and thinking skills. First symptoms can appear for most of the people in their mid-60s and most common cause in adults which has the loss of cognitive operating, memorizing and thinking. As we all know life for any disabled/elderly person can become very miserable since they are constantly dependent on others to reduce their dependability, we have come up with the idea of GPS based disabled/elderly healthcare and security system. Which can keep tracking a location, and we have attached

biomedical sensors which will give his/her health status body temperature and pulse rate to the concerned authorities via SMS/Android Application. ARM LPC2138 is used as the main controller to which other peripherals such as GPS, GSM, LCD, Buzzer are connected. EEPROM is used as the main memory element for data storage.

[5] Since the patient needs to be monitored 24*7, it also significantly makes it difficult for the caretakers who need surrender their methods for vocation to administer the patient. . Wearable technology eases things for both patients whose safety is threatened and loved ones who could do with a helping hand. . Wearable technology eases things for both patients whose safety is threatened and loved ones who could do with a helping hand. Most of the devices available today largely focus on Global Positioning System (GPS) for tracking patients; it also alerts the caregivers if the patient wanders outside a predefined zone.

[6] People need occasional visits from a home nurse, some light housekeeping, meals on wheels, and visitors willing to talk and notify about pills. Dementia and other illnesses can require around the clock medical care and monitoring, things often more easily given in a professional facility than at home. On the other end, increasing number of smart systems opens area where medical treatment can be utilized to completely new level. In this paper we show a working solution how a smart home can be utilized to help people with medication related remainders. Proposed flow starts when a new medication prescription is taken from the doctor. E-Health system generates QR code which is then delivered as part of prescription, holding set of information, such as medications treatment, duration, and next visit and similar. This set of information is used by the expert system which handles all the notifications generated by prescription. In used system, three types of notifications are used, smart phone notifications, home voice and video notifications.

[7] Near 48% of Medicare beneficiaries aged 65 years or older had at least three chronic medical conditions, and 21% had 5 or more. Multiple medications increased the risk for adverse drug events. Hospital statistics in Taiwan also show that the elderly also suffer from a variety of chronic diseases, a high proportion of different drugs mixed and misuse may cause danger. Drugs kits provided by the hospital have own packaging tablets for preservation with a separate bag. If patient relocates the drug using personal drug packages, removing medications information may cause mixing and cross-interference. The design was implemented by clipping the bag directly, the subjects classified by illness with medicine clip folder. For categories of medicine: design easy-to-understand graphics icon, which helps seniors with low vision. Portability: Chronic diseases identified by the colour of the LED on medicine clipper. Bag clip designed to accommodate a variety of chronic drugs. Further Remote Care: Through the App, one can pre-set the prompt (usually caregiver). Through detecting interconnected switches, the caregiver receives elder medication status remotely. Through the bottom of the medicine bag rack with hooks and magnetic, the stand can install in living space. The magnetic force also enables drug bags to firmly fixed.

[8] In this study, the author has proposed to build applications with the support of sensor technology and GPS, involving the coordinates of the child's location as input data and parents as users. The input target of this app is the coordinates of the child's location. To facilitate the input data, a tool was developed as a location information provider for the children. Here we use a GPS Module that sent the coordinates of the location of the child. Furthermore, data will be sent to the server by GSM shield and processed into new information for the user. Then, a notification will also be sent to the user if the marked object exits the secure area marked on the app that the user will know the movement of the monitoring object. Locations marked by the user can be saved and reused by the user. One of the advantages of this application that user can define a place in real-time and looks like using Google Maps. Location monitoring has been done a lot now, but objects and users must have mobile phones that have GPS facilities as data transfer co-ordinate's location. For children, using a mobile phone is not an easy thing. Therefore, it is necessary to provide a sensor tool for the object. Sensors will be installed within the child so that the presence of the child can be monitored. Sensors will send the coordinates of the child to the server and will then be processed by the application system and displayed in the form of Google Maps.

[9] As already known, one among the fatal problems which causes the death of humans is respiratory disease. On the off chance that checking our wellbeing consistently, at that point various sicknesses can be identified by recognizing them well in advance. Many individuals have lost their lives to coronary syndromes. Especially at this point time (Corona virus period) doctors cannot physically meet

and treat the patients until and unless the situation is critical. The project "Heart pulse monitoring and notification system using Arduino mainly concentrates on the communication gap between the patient and the concerned doctor. The author has tried to reduce the gap between them by introducing the concept of notification system to the already proposed model. For this purpose, with the help of the knowledge we gained from the IoT course, they have used TWILIO as their online SMS service to send notification regarding the heart pulse of the patient. They have used the similar sensor to detect the heart pulse of the patients which is the pulse sensor. When a finger is put on pulse sensor there is an LED which emits ultraviolet light onto the finger and detects the vein in the finger whenever there is any change blood flow change in the vein that value is sensed by the ambient light sensor. According to which the heartbeat is calculated.

[10] In a quite large number of health care facilities, devices are put out of service after having a serious damage without taking into account making use of their accessories. This paper presents a design of an interfacing circuit that uses a pulse oximeter probe in order to obtain heart rate and oxygen saturation. Two important clinical measurements that indicate the state of a patient's vital functions are blood oxygen saturation and pulse rate. Pulse oximetry is a non-invasive method for measuring the percentage of oxy-haemoglobin in arterial blood. Pulse oximeters are formed using two light emitting diodes (LEDs) with different wavelengths (a red LED at around 660 nm and an infrared LED at 880 nm - 940 nm) and a photodetector (photodiode, phototransistor) [6,7]. According to the path of light from the LEDs to the photodetector pulse oximeters are mainly classified into two main types transmittance pulse oximeters at which the LEDs are directly on the opposite side of the photodetector.

CHAPTER: 3

METHODOLOGY AND IMPLEMENTAION

3.1. BLOCK DIAGRAM:

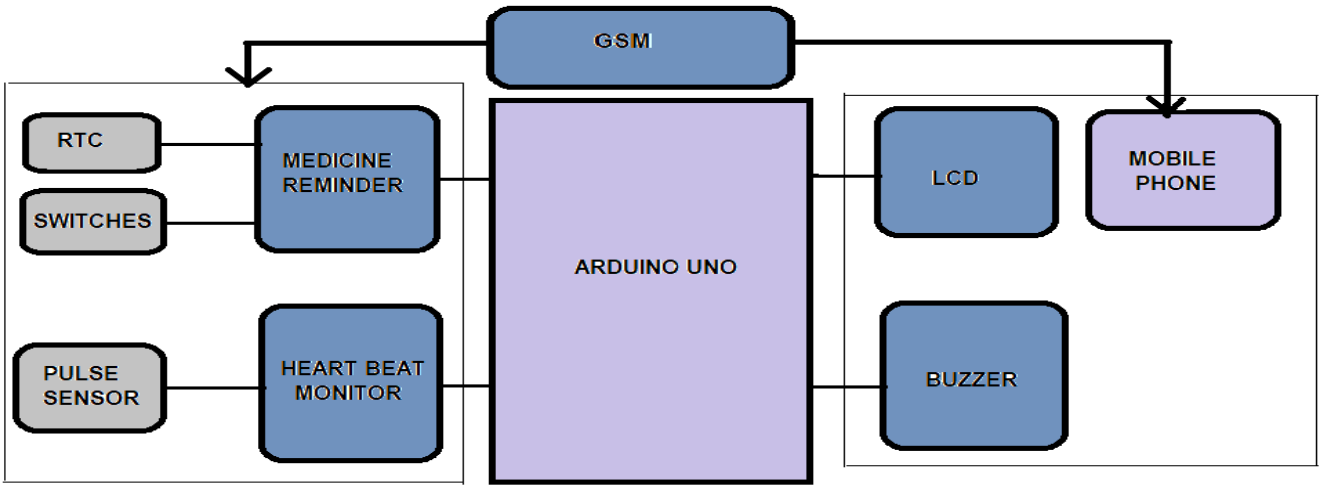

Fig:3.1

3.2 PROJECT FLOW:

MEDICINE REMINDER:

Alzheimer's patients might forget to take their medicines on time. Thus, continuous monitoring of patient's medication is another vital thing. Whenever the patient will take medication, smart medicine box will activate buzzer and indicate through LCD. Then a text alert will be sent to the concerned person/nurse.

HEARTBEAT MONITOR:

The heart monitoring device allows to monitor the heart rate of the patient and notify the concerned person in case of irregular heart rate. If the heart rate of the patient rises above a threshold value, the nurse/concerned person will be informed about the patient's condition. Based on the situation the nurse will take first aid measures and call on doctor in case of emergency.

3.3. DETAILED CIRCUIT DIAGRAM

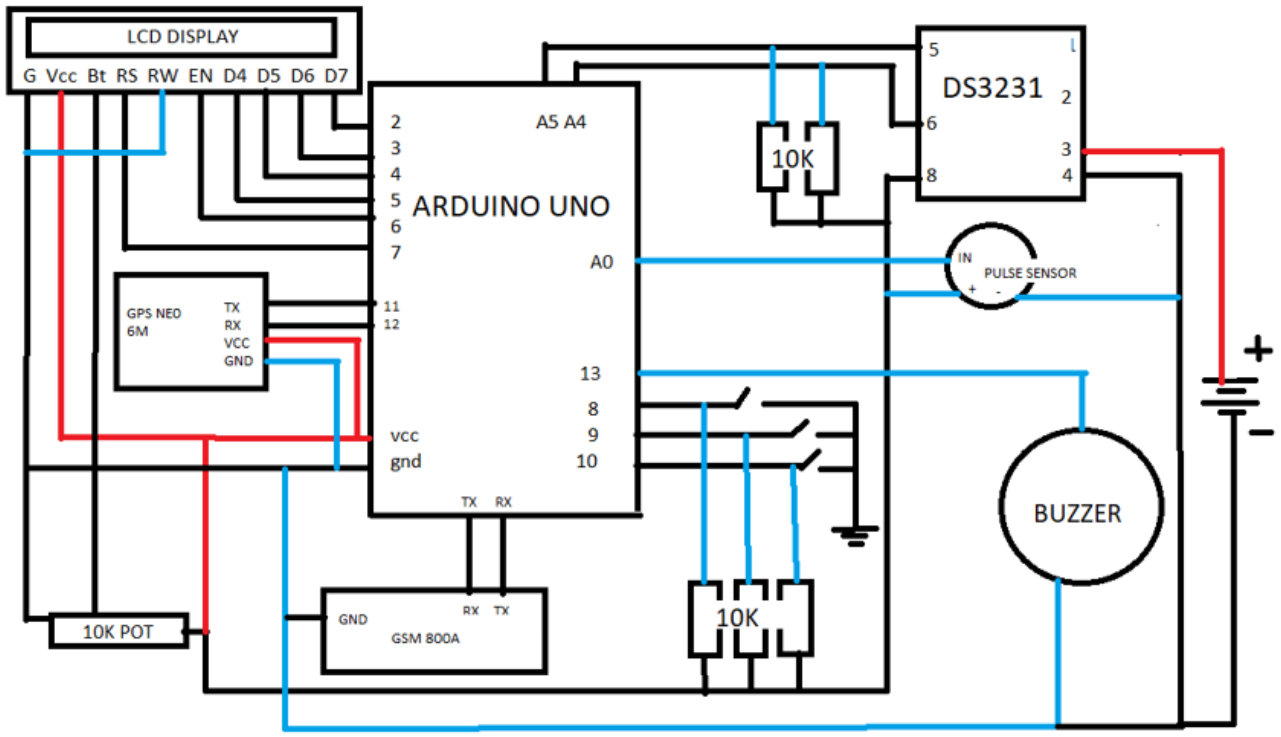

Fig:3.3

3.4 HARDWARE ARCHITECTURE

3.4.1 COMPONENTS DESCRIPTION

1. Arduino Uno
2. RTC DS3231
3. GSM SIM800A
4. Push Buttons
5. LEDs
6. Resistor
7. Power supply
8. Buzzer
9. 16x2 LCD
10. Pulse sensor

3.4.1.1. ARDUINO UNO:

Arduino is open source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc.[2][3] The board is equipped with sets of digital and Analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.[1] The board has 14 digital I/O pins (six capable of PWM output), 6 Analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable.[4] It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is similar to the Arduino Nano and Leonardo.[5][6] The hardware reference design is distributed under a Creative Commons Attribution Share-Alike 2.5 license and is available on the Arduino website. Layout and production files for some versions of the hardware are also available

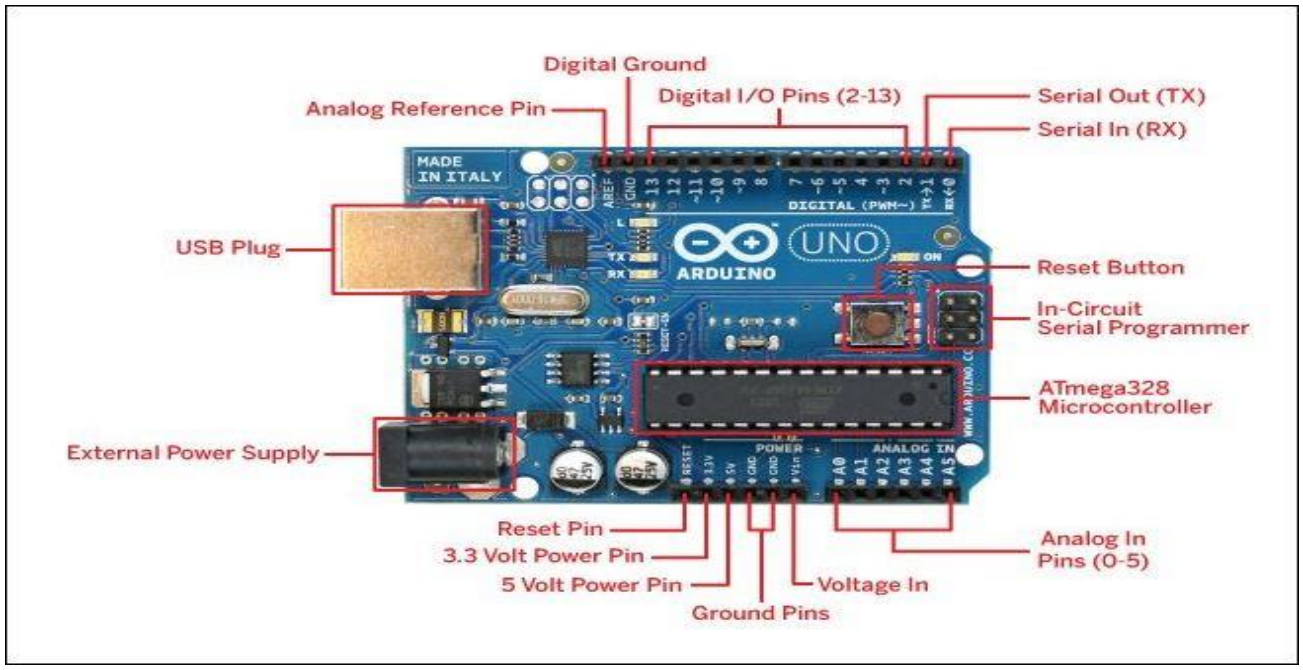

Fig:3.4.1

- Microcontroller: Microchip ATmega328P[7]
- Operating Voltage: 5 Volts
- Input Voltage: 7 to 20 Volts
- Digital I/O Pins: 14 (of which 6 can provide PWM output)
- PWM Pins: 6 (Pin # 3, 5, 6, 9, 10 and 11)
- UART: 1
- I2C: 1

- SPI: 1
- Analog Input Pins: 6
- DC Current per I/O Pin: 20 mA
- DC Current for 3.3V Pin: 50 mA
- Flash Memory: 32 KB of which 0.5 KB used by bootloader
- SRAM: 2 KB
- EEPROM: 1 KB
- Clock Speed: 16 MHz

3.4.1.2.RTC DS3231

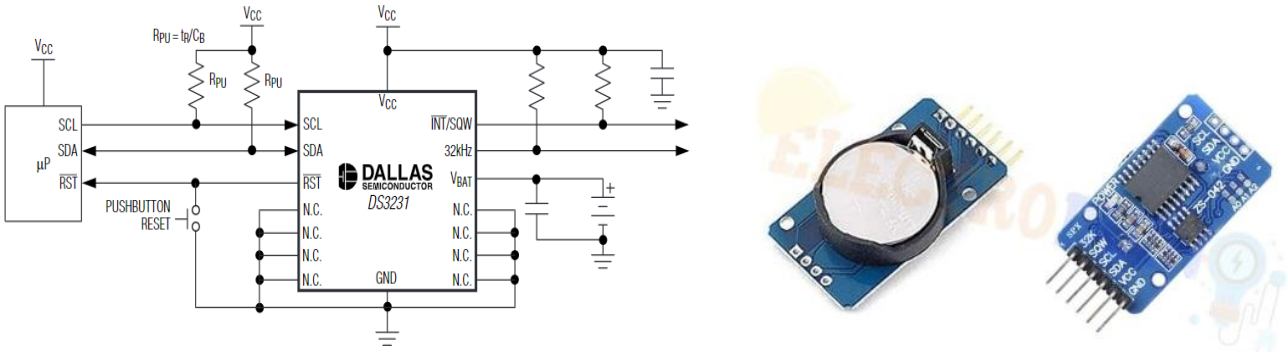

Fig:3.4.2

The DS3231 is a low-cost. Has 6 pins in which 4 pins are used in this project, they are SDA, SCA, VCC, GND. These are available in commercial and industrial temperature ranges, and is offered in a 16-pin, 300-mil SO package. The RTC maintains seconds, minutes, hours, day, date, month, and year information. The date at the end of the month is automatically adjusted for months with fewer than 31 days, including corrections for leap year. The clock operates in either the 24-hour or 12-hour format with an AM/PM indicator.

Two programmable time-of-day alarms and a programmable square-wave output are provided. Address and data are transferred serially through an I2C bidirectional bus. A precision temperature-compensated voltage reference and comparator circuit monitors the status of VCC to detect power failures, to provide a reset output, and to automatically switch to the backup supply when necessary. Additionally, the RST pin is monitored as a pushbutton input for generating a µP reset.

3.4.1.3.GSM SIM800A

Fig:3.4.3

The SIM800A Quad-Band GSM/GPRS Module with RS232 Interface is a complete Quad-band GSM/GPRS solution in an LGA (Land grid array) type which can be embedded in the customer applications. SIM800A support Quad-band 850/900/1800/1900 MHz, it can transmit Voice, SMS and data information with low power consumption. With a tiny size, it can fit into slim and compact demands of custom design. Featuring and Embedded AT, it allows total cost savings and fast time-to-market for customer applications.

The SIM800A modem has a SIM800A GSM chip and RS232 interface while enables easy connection with the computer or laptop using the USB to the Serial connector or to the micro-controller using the RS232 to TTL converter. Once you connect the SIM800A modem using the USB to RS232 connector, you need to find the correct COM port from the Device Manager of the USB to Serial Adapter.

Then you can open Putty or any other terminal software and open a connection to that COM port at 9600 baud rate, which is the default baud rate of this modem. Once a serial connection is open through the computer or your micro-controller you can start sending the AT commands. When you send AT commands for example "AT\r" you should receive back a reply from the SIM800A modem saying "OK" or other response depending on the command sent.

3.4.1.4. PUSH BUTTONS

Fig:3.4.4

A push-button (also spelled pushbutton) or simply button is a simple switch mechanism to control some aspect of a machine or a process. Buttons are typically made out of hard material, usually plastic or metal. The surface is usually flat or shaped to accommodate the human finger or hand, to be easily depressed or pushed. Buttons are most often biased switches, although many un-biased buttons (due to their physical nature) still require a spring to return to their un-pushed state, include pressing, depressing, mashing, slapping, hitting, and punching.

3.4.1.5.LED

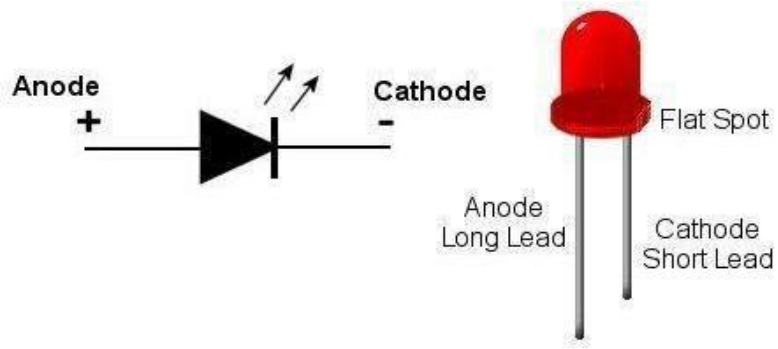

Fig:3.4.5

Light Emitting Diodes (LED) is the most used elements for displaying pins digital states. It is as shown in Fig. The LED are used to indicate which medicine has to be taken at a particular time.

3.4.1.6. RESISTOR

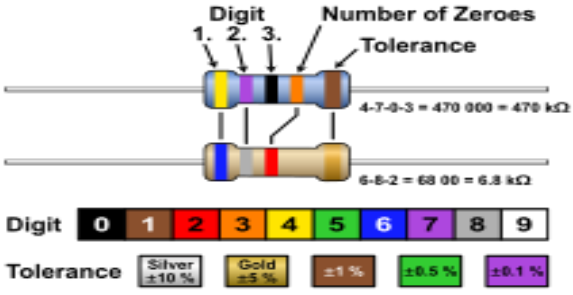

Fig:3.4.6

A resistor is a passive two terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses. High-power resistors that can dissipate many watts of electrical power as heat may be used as part of motor controls, in power distribution systems, or as test loads for generators. Fixed resistors have resistances that only change slightly with temperature, time or operating voltage. Variable resistors can be used to

adjust circuit elements (such as a volume control or a lamp dimmer), or as sensing devices for heat, light, humidity, force, or chemical activity.

3.4.1.7. POWER SUPPLY

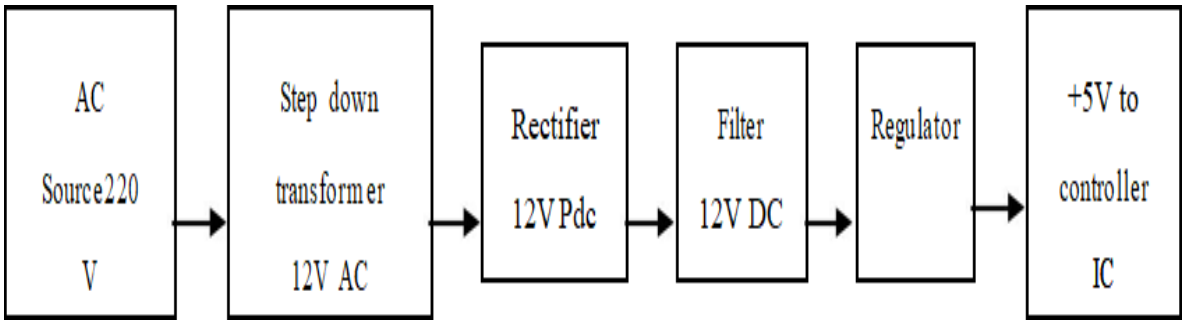

Fig:3.4.7

The power supply can be considered as providing an electrical signal to the circuit. There are many varieties of power supply units. The greater part of them is intended to convert a fitting low voltage supply from high voltage power to circuits and specific gadgets.

In this project 5 volts power supply is used for the Arduino board and the GSM, GPS require 5v power supply. The RTC and the pulse sensor require 3.3v power supply for the operation.

3.4.1.8. BUZZER

Fig:3.4.8

Buzzer/beeper is an audio signing device. It is as shown in Fig. In this project buzzer beeps to indicate which medicine to take. A buzzer is an audio waving device, which can be present automated, electro mechanicals. Representative uses of beepers and beeper consist the unease devices, regulators, and user input1 such as a mouse click. Piezoelectric beeper, were developed by Japanese manufacture ring and baggy into a wide collection of produces during the 1970s to1980s. This growth was mostly due to cooperative hard work by Japanese construction businesses. In 1951, here cognized the "Barium

Titan Request Research Committee", which permitted corporations to bring on many piezoelectric innovations and inventions.

3.4.1.9. 16X2 CD DISPLAY

Fig:3.4.9

The LCD can add a load to the current app about providing a customer's accommodation, investigating the application or actually giving it a "professional" look. The most popular type of LCD is the Hitachi 44780 which has a similar size. Inexperienced designers do not try to use this approach a program manager because it is tricky to seek intelligent displays at the border, implementing this boundary can be problematic and therefore the protests themselves are expensive. After dumping the program, the information will be displayed on the LCD. LCD has single, double- and four-line displays. Every line has 16 characters. In this project Two-line display is used i.e., 16*2 LCD. 8 pins of LCD are connected to P89V51RD2 for transmitting data and one pin is connected to both registers select and enable. The LCD displays the time, date and guides the patient to take a particular medicine.

Pin no.	Symbol	External connection	Function
1	Vss	Power supply	Signal ground for LCM
2	V_{DD}		Power supply for logic for LCM
3	V_0		Contrast adjust
4	RS	MPU	Register select signal
5	R/W	MPU	Read/write select signal
6	E	MPU	Operation (data read/write) enable signal
7~10	DB0~DB3	MPU	Four low order bi-directional three-state data bus lines. Used for data transfer between the MPU and the LCM. These four are not used during 4-bit operation.
11~14	DB4~DB7	MPU	Four high order bi-directional three-state data bus lines. Used for data transfer between the MPU
15	LED+	LED BKL power supply	Power supply for BKL
16	LED-		Power supply for BKL

Table:3.1

3.4.1.10. PULSE SENSOR

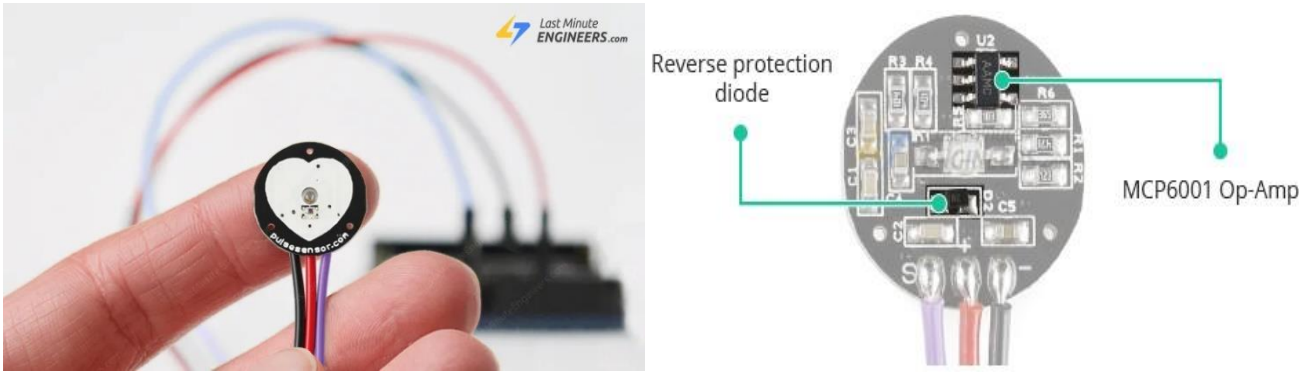

Fig:3.4.10

The Pulse Sensor is a well-designed low-power plug-and-play heart-rate sensor for the Arduino. The module requires a DC power supply ranging from 3.3 to 5V and draws less than 4mA of current. works by shining a green light (~ 550nm) on the finger and measuring the amount of reflected light with a photosensor. This optical pulse detection technique is known as a Photoplethysmogram.

3.5. SOFTWARE DESCRIPTION

It is an operating system on top of which each application necessary for the undertaken project has been cleared. By installing operating system into computer and following the software instructions, can reach software requirements.

Software Used: Arduino IDE

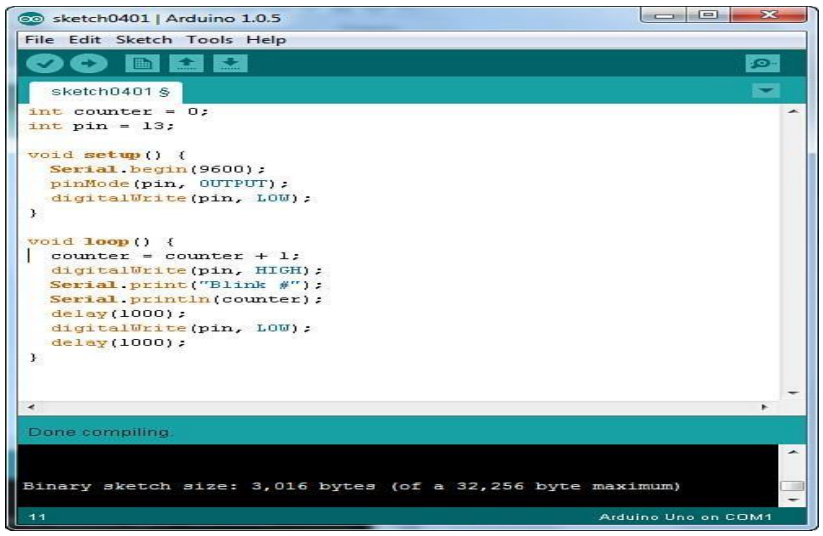

Fig:3.5

Arduino has Integrated Expansion Environment (IDE) as an IT software package. This package covers a window as text publishing manager for writing the code, text console, message space and toolbars with oft buttons for performing general functions. The transfer of programs and its communication with other interfaces.

CHAPTER: 4

RESULTS AND DISCUSSION

4.1 RESULTS

System reminds the patients to take medicines at doctor prescribed time and helps the caretaker to know the location of the patient. Easy to monitor the heartbeat of the patient.

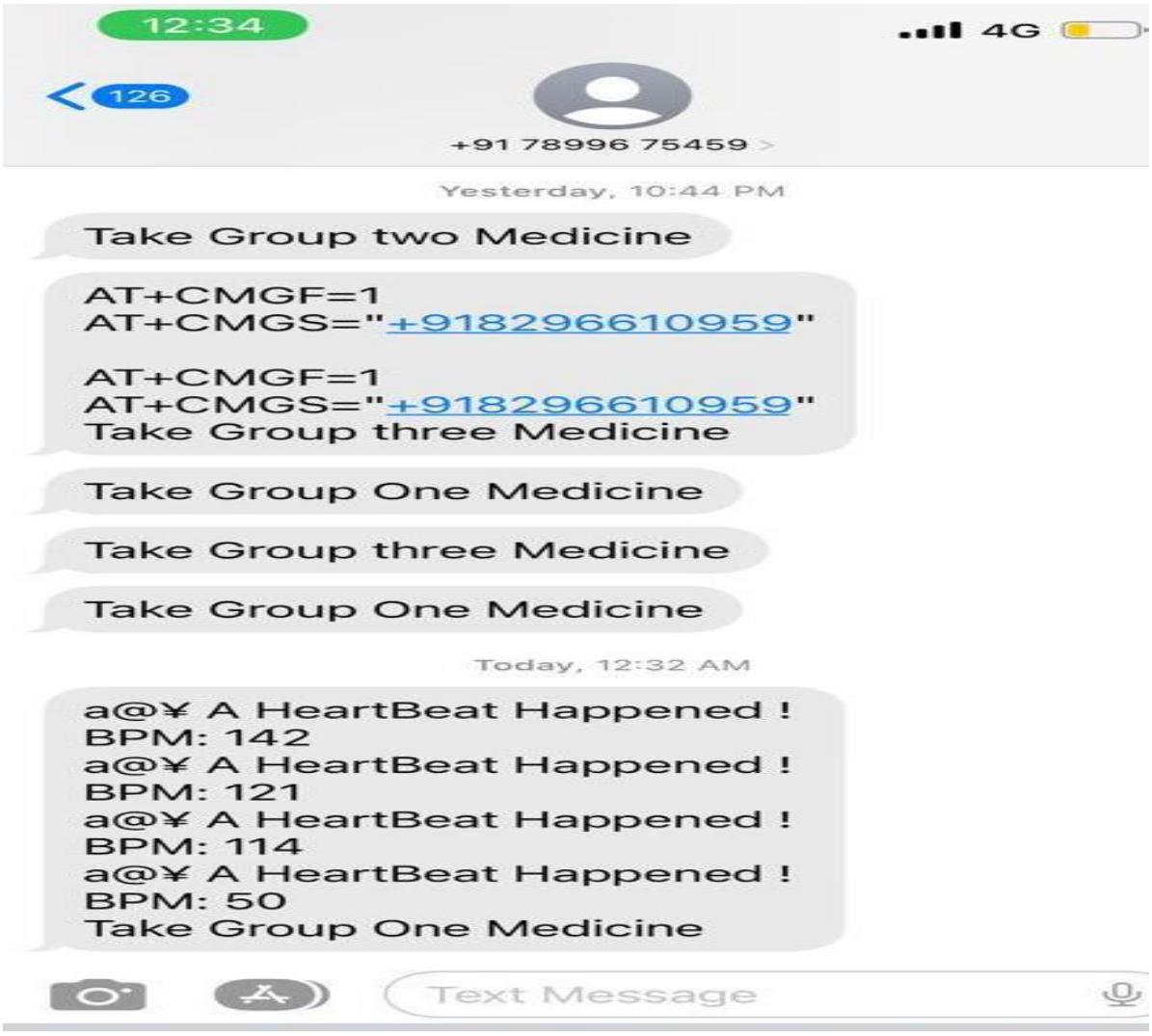

Fig:5.1

Figure 5.1 shows the update of the patient information to the caretaker. This module frequently senses the heartbeat and notifies to the caretaker if the patient heartbeat is abnormal .

Fig:5.2

Figure 5.2 shows the time and date display, this is the main screen that is display in the device.

4.2. ADVANTAGES

- It is a portable system as it can be implemented as a smart watch.
- It is very cost effective, as it is implemented with less complexities.
- As it is implemented for the Alzheimer's patients it is made user friendly.
- This system is compatible with old keypad phones, it doesn't require the smart phone for its operation.
- It eliminates the requirement of caretaker.

4.3. APPLICATION

- This system provide assistance for elderly people, who wants to take medicines at the prescribed time.
- System monitors the patients location, and provide the location message to the care taker.

CHAPTER: 5

CONCLUSION

With increased development in the technology and with increasing number of smart systems opens area where medical treatment can be utilized to completely new level. Here we are making an attempt in providing smart assistance for the people suffering with Alzheimer's disease and also helps in reducing work pressure of the care takers.

5.2 FUTURE SCOPE

- In the further implementation by using speech assistance and face recognition instead of the buzzers, alarms, and display.
- As the GPS module is most useful to identify the patient movement only at the outside environment. To identify the patients in an apartment, a Wi-fi module can be used. when the device of the patient is connected to Wi-fi module at home. this says that the patient is inside to home. if his module is disconnected then he is outside the home.
- This project can be future implemented with medicine dispatcher device.

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CODE:

```
#include <Wire.h>
#include<EEPROM.h>
#include <RTClib.h>
#define USE_ARDUINO_INTERRUPTS true
#include <PulseSensorPlayground.h>
#include <LiquidCrystal.h>
#include <SoftwareSerial.h>
SoftwareSerial serial(0, 1);

LiquidCrystal lcd(7, 6, 5, 4, 3, 2);
RTC_DS1307 RTC;
int temp,inc,hours1,minut,add=11;
int next=10;
int INC=9;
int set_mad=8;
const int PulseWire = 0; // PulseSensor PURPLE WIRE connected to ANALOG PIN 0
int Threshold = 550;
PulseSensorPlayground pulseSensor;



#define buzzer 13


int HOUR,MINUT,SECOND;


void setup()
{
  Serial.begin(9600);
  lcd.begin(20,4);
pulseSensor.analogInput(PulseWire);
//pulseSensor.blinkOnPulse(LED13); //auto-magically blink Arduino's LED with heartbeat.
pulseSensor.setThreshold(Threshold);
if (pulseSensor.begin())
{
//Serial.println("We created a pulseSensor Object !"); //This prints one time at Arduino power-up, or on Arduino
reset.
```

```
}

 Serial.print("\r");
 delay(1000);
 Serial.print("AT+CMGF=1\r");
 delay(1000);
 Serial.print("AT+CMGS=\"+918296610959\"\r");
 delay(1000);
Wire.begin();
RTC.begin();
lcd.begin(16,2);
pinMode(INC, INPUT);
pinMode(next, INPUT);
pinMode(set_mad, INPUT);
pinMode(buzzer, OUTPUT);

  lcd.setCursor(0,0);
  lcd.print("Automated assist");
  lcd.setCursor(0,1);
  lcd.print("Alzhemeir patients");
   delay(2000);


if(!RTC.isrunning())
{
RTC.adjust(DateTime(__DATE__,__TIME__));
}
}

void loop()
{
int myBPM = pulseSensor.getBeatsPerMinute();
if (pulseSensor.sawStartOfBeat()) { // Constantly test to see if "a beat happened".
Serial.println("♥ A HeartBeat Happened ! "); // If test is "true", print a message "a heartbeat happened".
Serial.print("BPM: "); // Print phrase "BPM: "
Serial.println(myBPM); // Print the value inside of myBPM.
```

```
lcd.setCursor(0,0);
lcd.print("HeartBeat Happened !"); // If test is "true", print a message "a heartbeat happened".
lcd.setCursor(0,1);
lcd.print("BPM: "); // Print phrase "BPM: "
lcd.print(myBPM);
}
delay(20);
  int temp=0,val=1,temp4;
  DateTime now = RTC.now();
  if(digitalRead(set_mad) == 0)      //set medicine time
  {
    lcd.setCursor(0,0);
  lcd.print("  Set Medicine  ");
  lcd.setCursor(0,1);
  lcd.print("  Reminder time ");
   delay(2000);
   lcd.clear();
   lcd.setCursor(0,0);
   lcd.print("Enter Time 1");
   defualt();
   time(1);
   delay(1000);
   lcd.clear();
   lcd.setCursor(0,0);
   lcd.print("Enter Time 2");
   defualt();
   delay(1000);
   time(2);
   lcd.clear();
   lcd.setCursor(0,0);
   lcd.print("Enter Time 3");
   defualt();
time(3);
    lcd.setCursor(0,0);
  lcd.print("Medicin reminder");
  lcd.setCursor(0,1);
```

```
   lcd.print("  time has set  ");
    delay(2000);
 }
 lcd.clear();
 lcd.setCursor(0,0);
 lcd.print("Time:");
 lcd.setCursor(6,0);
 lcd.print(HOUR=now.hour(),DEC);
 lcd.print(":");
 lcd.print(MINUT=now.minute(),DEC);
 lcd.print(" "); // Print phrase "BPM: "
 lcd.print(myBPM);
 lcd.setCursor(0,1);
 lcd.print("Date: ");
 lcd.print(now.day(),DEC);
 lcd.print("/");
 lcd.print(now.month(),DEC);
 lcd.print("/");
 lcd.print(now.year(),DEC);
 match();
 delay(200);
lcd.print(" "); // Print phrase "BPM: "
lcd.print(myBPM);
}

void defualt()
{
  lcd.setCursor(0,1);
  lcd.print(HOUR);
  lcd.print(":");
  lcd.print(MINUT);
  lcd.print(":");
  lcd.print(SECOND);
}

//Function to set alarm time and feed time
```

```
void time(int x)
{
  int temp=1,minuts=0,hours=0,seconds=0;
    while(temp==1)
    {
     if(digitalRead(INC)==0)
     {
      HOUR++;
      if(HOUR==24)
      {
       HOUR=0;
      }
      while(digitalRead(INC)==0);
     }
lcd.clear();
      lcd.setCursor(0,0);
    lcd.print("Enter Time ");
   lcd.print(x);
    lcd.setCursor(0,1);
    lcd.print(HOUR);
    lcd.print(":");
    lcd.print(MINUT);
    lcd.print(":");
    lcd.print(SECOND);
    delay(100);
    if(digitalRead(next)==0)
    {
      hours1=HOUR;
      EEPROM.write(add++,hours1);
     temp=2;
     while(digitalRead(next)==0);
    }
    }
    while(temp==2)
    {
```

```
if(digitalRead(INC)==0)
     {
      MINUT++;
      if(MINUT==60)
      {MINUT=0;}
      while(digitalRead(INC)==0);
     }
      lcd.clear();
      lcd.setCursor(0,0);
    lcd.print("Enter Time ");
   lcd.print(x);
    lcd.setCursor(0,1);
    lcd.print(HOUR);
    lcd.print(":");
    lcd.print(MINUT);
    lcd.print(":");
    lcd.print(SECOND);
    delay(100);
      if(digitalRead(next)==0)
      {
       minut=MINUT;
       EEPROM.write(add++, minut);
       temp=0;
       while(digitalRead(next)==0);
      }
    }
    delay(1000);
}



/* Function to chack medication time */


void match()
{
  int tem[17];
  for(int i=11;i<17;i++)
```

```
 {
   tem[i]=EEPROM.read(i);
}
 if(HOUR == tem[11] && MINUT == tem[12])
 {
 beep();
 beep();
 beep();
 beep();
 lcd.setCursor(0,0);
 lcd.print("  Take Group One  ");
 lcd.setCursor(0,1);
 lcd.print("     Medicine     ");
 beep();
 beep();
 beep();
 beep();
 Serial.print("Take Group One Medicine");
delay(1000);
Serial.write(0x1A);
delay(1000);
 }

 if(HOUR == tem[13] && MINUT == tem[14])
 {
    beep();
 beep();
 beep();
 beep();
  lcd.setCursor(0,0);
 lcd.print("  Take Group Two  ");
 lcd.setCursor(0,1);
 lcd.print("     Medicine     ");
  beep();
 beep();
 beep();
```

```
  beep();
  Serial.print("Take Group two Medicine");
 delay(1000);
 Serial.write(0x1A);
 delay(1000);
  }


  if(HOUR == tem[15] && MINUT == tem[16] )
  {
    beep();
  beep();
  beep();
  beep();
   lcd.setCursor(0,0);
  lcd.print("Take Group Three ");
  lcd.setCursor(0,1);
  lcd.print("     Medicine    ");
  beep();
  beep();
  beep();
  beep();
  Serial.print("Take Group three Medicine");
 delay(1000);
 Serial.write(0x1A);
 delay(1000);
  }
}

/* function to buzzer indication */

void beep()
{
  digitalWrite(buzzer,HIGH);
  delay(500);
  digitalWrite(buzzer, LOW);
```

```
  delay(500);
}
```