MINI KASHAYAM VENDING MACHINE

A PROJECT REPORT

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BONAFIDE CERTIFICATE

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INTERNAL EXAMINER   **EXTERNAL EXAMINER**

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ABSTRACT

The goal of process streamlining in the modern business environment is to reduce time, effort, and costs. This is made simple by combining machinery and software. The goal of this project is to create Kashaya vending machines that can sell Kashaya. Ayurvedic decoctions are frequently made by hand, which takes a lot of time. This project helps make kashaya preparation efficient and portable. The author of this essay primarily focuses on how technology helps to improve the convenience of our daily lives. Vending machines have gained popularity recently, and customers are progressively coming to embrace them. Compared to conventional methods of purchasing, these devices are more dependable, accessible, and practical.This project's objective is to build a vending machine for herbal infusions (Kashaya). The contribution of this project is to develop a portable kashaya machine that brews and serves the beverage using a certain plant. The goal of this project is to create a portable Kashaya device that can be used and transported anywhere and alert the user of the temperature and amount level. The goal of this project is to meet the specific needs of the consumer, particularly in the small-scale sector, in order to give the consumer the choice of selecting the kinds of tea or coffee he or she desires.

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CHAPTER 1

INTRODUCTION

A vending machine is an automated machine that provides items such

as snacks, beverages, cigarettes, and lottery tickets to consumers after cash, a credit

card, or other forms of payment are inserted into the machine or otherwise made. The

first modern vending machines were developed in England in the early 1880s and

dispensed postcards. Vending machines exist in many countries and, in more recent

times, specialized vending machines that provide less common products compared to

traditional vending machine items have been created.

Similar to the development of traditional mobile phones into smartphones, vending

machines have also progressively, though at a much slower pace, evolved into smart

vending machines. Newer technologies at a lower cost of adoption, such as the large

digital touch display, internet connectivity, cameras and various types of sensors, more

cost-effective embedded computing power, digital signage, various advanced payment

systems, and a wide range of identification technology (NFC, RFID, etc.) have

contributed to this development. These smart vending machines enable a more

interactive user experience, and reduce operating costs while improving the efficiency

of the vending operations through remote manageability and intelligent back-

end analytic. Integrated sensors and cameras also represent a source of such data as

customer demographics, purchase trends, and other locality-specific information. It

also enables better customer-engagement for the brands through interactive multimedia and social media connectivity. Smart vending machines were No.79 by JWT Intelligence on its list of 100 Things to Watch in 2014. According to market research by Frost & Sullivan, global shipments of smart vending machines are forecasted to reach around 2 million units by 2018, and further to 3.6 million units by 2020 with penetration rate of 20.3 percent.

From 2000 to 2010, the specialization of vending machines became more common. Vending extended increasingly into non-traditional areas like electronics, or even artwork or short stories. Machines of this new category are generally called Automated retail kiosks. When using an automated retail machine, consumers select products, sometimes using a touchscreen interface, pay for purchases using a credit or debit card and then the product is dispensed, sometimes via an internal robotic arm in the machine.

Kashayam have become engrained in people's daily lives all around the world during this epidemic. Given the pandemic situation, MNCs or small-scale firms opt to respect their employees' health by giving them kashayam rather than coffee or tea.Depending on the individual's preferences and condition of health, there are numerous different types of kashayam, and because they require substantial preparation, the time it takes for them to be administered is crucial. It may take the Kashayam 10 to 15 minutes to reach the client in busy workplaces where every second counts. Kashayam vending machines can assist with this problem.

TYPES OF VENDING MACHINE

CHANGE MACHINE

A change machine is a vending machine that accepts large

denominations of currency and returns an equal amount of

currency in smaller bills or coins.

Typically these machines are used to provide coins in exchange for paper currency, in

which case they are also often known as bill changers.

Newspaper vending machine

A newspaper vending machine or newspaper rack is a

vending machine designed to distribute

newspapers. Newspaper vending machines are used

worldwide, and they can be one of the main distribution

methods for newspaper publishers. According to the Newspaper Association of

America, in recent times in the United States, circulation via newspaper vending

machines has dropped significantly: in 1996, around 46% of single-sale newspapers

were sold in newspaper boxes, and in 2014, only 20% of newspapers were sold in the

boxes

Ticket Machine

A ticket machine is a vending machine that produces tickets. For instance, ticket

machines dispense train tickets at railway stations, transit tickets at metro stations and

tram tickets at some tram stops and in some trams

CHAPTER 2

LITERATURE SURVEY

SuthagarS,K.S.Tamilselvan, et, all[1]

In this Paper the author provided a RFID tag to each Farmer, which has a unique code. The code is shown on the RFID card reader LCD when the RFID tag is punched. The milk is dumped in the tank, which determines its quality and quantity. A pH sensor was used to assess the quality of the milk, and an ultrasonic sensor was used to calculate its quantity. According to its quality, milk is divided into three categories: first quality, second quality, and rejection. To separate the components, three solenoid valves are used. Based on its quality, milk is segregated into different tanks. PC receives data about the price, quality, and quantity of milk.The cash note is deposited by the consumer.They employed a web camera to record the image of the money note, which was then compared to a database on the computer. For quality selection based on client preference, they employed a switch. Milk is sold based on the amount of rupees placed and the quality chosen by the buyer. A 4°C refrigeration temperature is maintained throughout the system.

P.Pradeepa,et, all [2]

When a coin is inserted, vending machines dispense little amounts of various things. Microcontroller and FPGA boards can be used to implement these machines in a variety of ways. In this research, we present an efficient technique for vending machine implementation using an FPGA board. FPGA-based vending machines respond quickly and consume less power than microcontroller-based vending machines. Four goods and three coins are supported by the FPGA-based vending machine. The vending machine accepts coins in any order as inputs and provides products when the required amount is placed. If the entered amount is larger than the price of the product, the change is returned.It also has a cancellation feature, which allows the user to cancel the request at any time and have the money refunded to them without any merchandise. The proposed algorithm is written in Verilog HDL and tested with the Xilinx ISE simulator. On the Xilinx Spartan-3A FPGA development board, the design is implemented.

Kwangsoo Kim, et, all [3]

In this paper the author mainly focuses on how technologies contribute to make our daily life more convenient. Many individuals buy coffee from vending machines without understanding whether or not they are clean. They created a sensor and actuator network and installed it inside a vending machine to track their cleaning state. The network keeps track of the machine's indoor environment and adapts the coffee's flavour

to the customer's preferences. A consumer uses a smartphone to view environmental data and regulate the amount of coffee, sugar, and powdered coffee creamer added to a cup of coffee. The phone and the machine communicate via Bluetooth. Better tailored service is supported by the established system.

Aditya Parulekar, et, all [4]

The goal of this project is to meet the specific needs of the consumer, particularly in the small-scale sector, by giving them the option of selecting the types of tea/coffee they want, as well as a suitable reservoir of water, such as a 1 litre mineral water bottle, thereby going one step beyond the machines currently available in the market for small scale organizations/industries/offices.

Ana Monga, Balwinder Singh [5]

A new technique to designing an FSM-based vending machine [3] with auto-billing functionalities is proposed in this study. The machine also has a cancel feature, which allows the user to cancel the request and have the money returned to them. The user will receive a bill detailing the total quantity of products delivered as well as the overall cost. This equipment is suitable for usage in hotels, restaurants, and food markets. This saves time and money

CHAPTER 3

KASHAYAM

Kashayam, also known as Kwath or decoction, is a type of herbal preparation in Ayurvedic and Siddha medicine. It is made by boiling a combination of herbs and water until the water is reduced to a concentrated decoction.

Kashayam is believed to have a range of health benefits due to the medicinal properties of the herbs used in the preparation. Depending on the specific herbs used, kashayam can be used to treat a variety of health conditions, including fever, cough, cold, digestive disorders, skin problems, and more.

Kashayam is usually consumed orally, and can be taken alone or mixed with honey or other natural sweeteners to make it more palatable. It is typically recommended to be taken on an empty stomach or before meals for best results.

It's important to note that while kashayam is a natural and traditional remedy, you should always consult with a qualified healthcare practitioner before using any herbal remedy to ensure it's safe and appropriate for your individual needs

OBJECTIVE

The objective of the project is to design and develop a Kashayam making machine, which dispenses the Kashayam of required quality in less time. The machine uses readily available Kashayam premix powder to prepare the Kashayam.

3.1 TYPES OF KASHAYAM AND ITS USES

- Nilavembu
- Aavarai

- Kabasura
- Arugampul

3.1.1 Kabasura Kudineer

Kabasura Kudineer is made of Chukku – Shunti – Ginger – Zingiber officinale – 6.66 % .It improves taste and digestion strength. Useful in treatment of asthma and chronic respiratory disorders and helps to boosting the lungs, improving respiratory mechanism and treating infectious conditions like cough, cold, fever and other respiratory infections

3.1.2 Nilavembu

Nilavembu Kashayam powder contains various herbs like nilavembu, vetiver, vilamichai ver, korai kizhangu, black peppercorn, ginger and sandal powder. Nilavembu helps to manage blood sugar levels and is useful for people suffering from diabetes. It also helps fight cancer and detoxifies the liver. Its rich

source of antimicrobial and antiviral properties help manage all kinds of fever including dengue, typhoid, influenza, malaria and chikungunya

3.1.3 Aavarai

Aavaram Poo also called Avarampoo in Tamil is a very popular shrub here Tamil Nadu. Avarampoo has wide health benefits, medicinal uses, and skin and hair care benefits. Avarampoo is traditionally used for treating diabetes and hair care benefits. Avarampoo is traditionally used for treating diabetes and problems.

3.1.4 Arugampul

Bermuda grass, scientifically termed as Cynodon dactylon, is a highly prized

ayurvedic plant for its impressive medicinal properties. Bermuda grass is highly esteemed and used extensively in Ayurveda and Siddha medicine for more than a thousand years for its impressive medicinal properties. The strong anti-viral and anti-bacterial properties of Bermuda grass is used in traditional medicine for treating various ailments like piles, skin and eye problems, bleeding disorder and other gynaecological problems.

CHAPTER 4

SIMULATION EXPLANATION
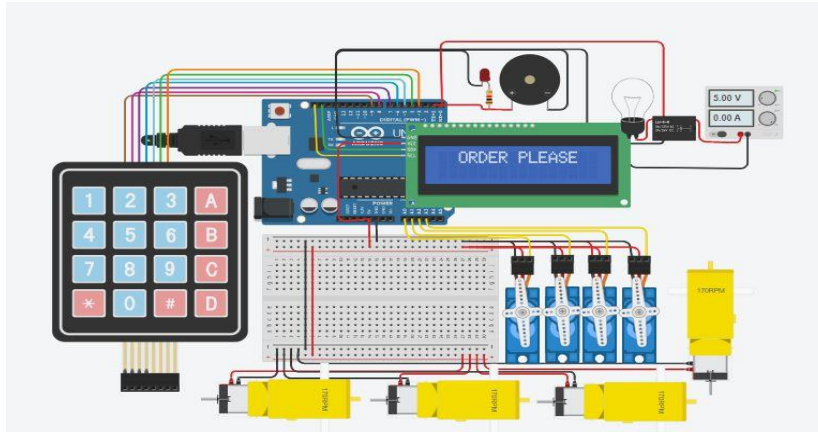
A relay and rectifier are linked to a 230 volt input in the circuit schematic. The Arduino board is provided a 5 volt power.This consists of 4 servo motors attached to the Arduino's A0, A1, A2, and A3 pins. The heater and input voltage are connected by the relay.The Arduino transmits an electrical signal to the relay.This 4 x 4 matrix keyboard is attached to pins 4, 5, 6, 8 and 9 in turn.

It has a connection to an LED display, four motors for vibration, and an adaptor that supplies an Arduino with 5 volts of power. The buzzer is wired up to the first and zeroth pins of the Arduino crosswise with an LED. The zero pin is connected to the relay.

The breadboard serves as the common input supply for the entire circuit and is connected to ground and 5V from the Arduino. The keyboard is linked to the Arduino from pins 3 to 9.
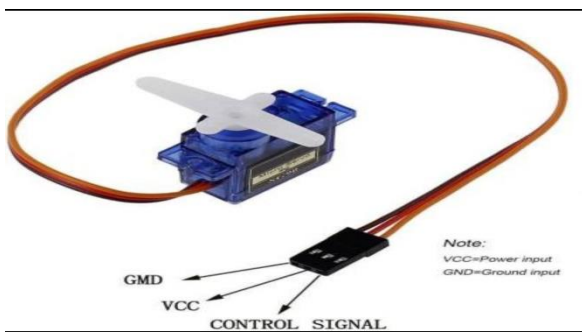
CHAPTER 5

MACHINE COMPONENTS

### 5.1 Electronic Component

5.1.1 Servo Motor

A servomotor is a rotary actuator or linear actuator that allows for precise control of

angular or linear position, velocity and acceleration. It consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated

controller, often a dedicated module designed specifically for use with servo motors

5.1.2 Arduino Uno Microcontroller
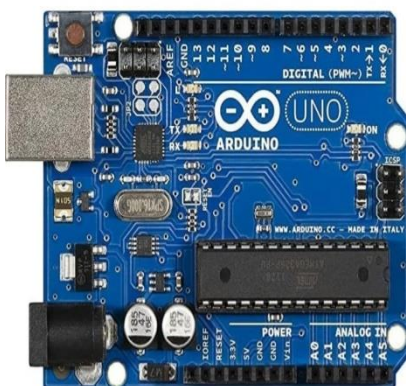
The ArduinoUno is a microcontroller board based on the ATmega328P.It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything

needed to support themicrocontroller; simply connect it to a computer with a USB

cable or power it with a AC-to-DC adapter or a battery to get started.

5.1.3 Container

Container can be made of food grade plastic . The container is provided with an arrangement for controlling the quantity of premix, which will fall in the cup. In the mechanism, Twist and turn mechanism is used for controlling the quantity with the help of servo . The quantity of premix powder that can be stored in the container is 200gms.

5.1.4 Appliance Body

The body is made of wood and acrylic sheet sheet which provides a structure on which all the components can be mounted and also provides support.

5.1.5 Inter-Integrated Circuit (I2C)
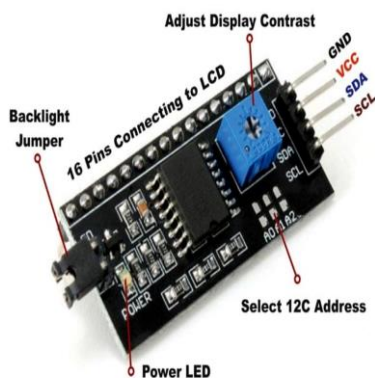
The I2C communication bus is very popular and broadly used by many electronic devices because it can be easily implemented in many electronic designs which require communication between a master and multiple slave devices or even multiple master devices. The easy implementations comes with the fact that only two wires are required for communication between up to almost 128 (112) devices when using 7 bits addressing and up to almost 1024 (1008) devices when using 10 bits addressing.

5.1.6 Water Heater

Water heating element works on the principle of resistive heating. It consists of a heating coil which gets heated when an electric current passes through it. Water from the bottle gets heated due to the coil. A solenoid operated valve ensures that the hot water reaches the cup in the required quantity by timing the opening and closing of the valve

5.1.7 Relay
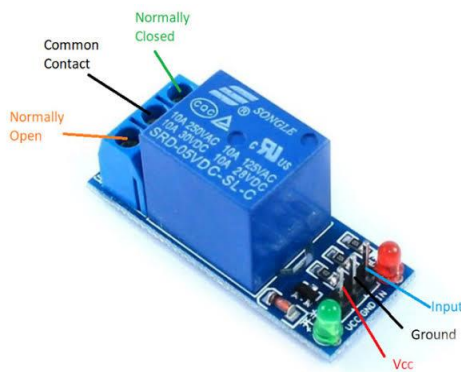
A relay is a device that controls the operation of other devices in an electric circuit by changing its electrical or physical state. A protective relay is a relay with the primary purpose of protecting service from interruption or preventing or limiting damage to apparatus. A protective relay is an electrical device that is meant to trip a circuit breaker when a malfunction is detected

5.1.8 Keypad
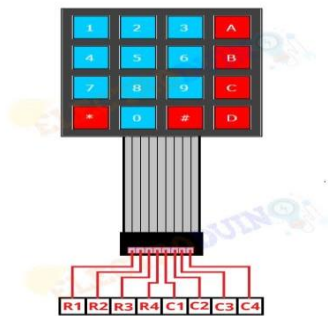
A 4x4 keypad contains 8 connections in total, 4 of which are connected to the column and the other rows of the switch matrix. One of the rows and columns are connected to another when a specific button is pressed 16 built-in pushbutton contacts that are coupled to the row and column lines make up this 4x4 matrix keypad. These lines can be scanned for a button-pressed status by a microcontroller. The Propeller sets all of the column lines and all of the row lines to input in the keypad library.

5.1.9 LCD Display
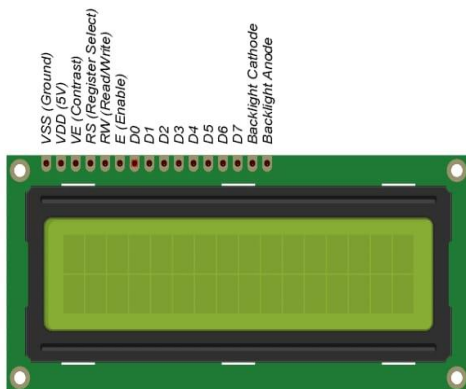
A 16x2 LCD display is a type of alphanumeric liquid crystal display (LCD) that can display 16 characters per line and has 2 lines. It is commonly used in electronic devices such as calculators, digital clocks, and small appliances for displaying text information.The 16x2 LCD display typically has a backlight for visibility in low light conditions and can be controlled by a microcontroller or other electronic device through a communication protocol such as the HD44780 protocol.

5.2 Explanation Of Mechanism

• Step 1 represents the initial condition when both the separation blade are in closed position.

• In step 2 the uppermost separation blade opens up due to which the Kashayam powder falls down in the space between upper and lower blade, thereby separating 1 teaspoon of powder which is represented by step 3.

• In step 4, the lower most separation blade opens due to which 1 teaspoon of powder falls into the cup.

• The same 4 steps are repeated depending on the selection of type of Kashayam by the user.

• The separation blades are controlled with the help of a servo motor which is driven by an Arduino microcontroller circuit.

• Once the desired quantity of powder falls into the cup, the water heater delivers the hot water into the cup at a temperature of 700C-850C.

• The contents in the cup are stirred with a spoon and the beverage is ready to be served.

CHAPTER 6

SOFTWARE DETAILS

6.1 Arduino Uno

The Arduino Uno is an open-source microcontroller board based on

the Microchip ATmega328P microcontroller and developed by Arduino.cc and

initially released in 2010. 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. 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. It can be powered by a USB cable or a barrel connector that accepts

voltages between 7 and 20 volts, such as a rectangular 9-volt battery. It is

similar to the Arduino Nano and Leonardo. 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

6.2 EMBEDDED C

Embedded C is a set of language extensions for the C programming language by the C Standards Committee to address commonality issues that exist between C extensions for different embedded systems.

Embedded C programming typically requires nonstandard extensions to the C language in order to support enhanced microprocessor features such as fixed-point arithmetic, multiple distinct memory banks, and basic I/O operations. The C Standards Committee produced a Technical Report, most recently revised in 2008 and reviewed in 2013, providing a common standard for all implementations to adhere to. It includes a number of features not available in normal C, such as fixed-point arithmetic, named address spaces and basic I/O hardwareaddressing. Embedded C uses most of the syntax and semantics of standard C, e.g., main() function, variable definition, datatype declaration, conditional statements (if, switch case), loops (while, for), functions, arrays and strings, structures and union, bit operations, macros, etc

CHAPTER 7

CONCLUSION

In this project, we have designed and developed a mini Kashayam making machine which is capable of dispensing the required quality of Kashayam in less time. The powder separation mechanism used in this machine has certain advantages over the presently used screw extruder mechanism. For instance, it is less complex and is consistent in operation. The heating unit consumes less power, thereby reducing operating costs.

There does not seem to be a commonly used or commercialised "kashayam machine" as of my knowledge's cutoff date in 2021. However, if such a device were to be created in the future, it would be dependent on a number of variables, including its efficiency, price, usability, and demand.

People who like natural therapies might start using the kashayam machine if it produced high-quality herbal extracts efficiently and at a fair price. It might also be helpful in countries like India where traditional Ayurvedic therapy is practised.

It is crucial to remember that the efficacy and safety of herbal treatments depend on a variety of elements, including the type and quantity of herbs used, the extraction technique, and the health of the individual.

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APPENDIX

CODE FOR PROTOTYPE

```
#include <Keypad.h>

#include <Servo.h>

#include <LiquidCrystal.h>

Servo bp1;

Servo bp2;

Servo bp3;

Servo bp4;

LiquidCrystal lcd(A5, A4, 13, 12, 11, 10);

int buzzer = 1;

int tonePin = 1;

int led = 1;

int led1 = 0;

int pos = 0;

const byte ROWS = 4;
```

```
const byte COLS = 4;

char hexaKeys[ROWS][COLS] =

{

  {'1','2','3','A'},

  {'4','5','6','B'},

  {'7','8','9','C'},

  {'*','0','#','D'}

};

byte rowPins[ROWS] = {9, 8, 7, 6};

byte colPins[COLS] = {5, 4, 3, 2};

Keypad customKeypad = Keypad( makeKeymap(hexaKeys), rowPins, colPins,

ROWS, COLS);

void setup()

{

  bp1.attach(A3);

  bp2.attach(A2);

  bp3.attach(A1);

  bp4.attach(A0);
```

```
bp1.write(0);

bp2.write(0);

bp3.write(0);

bp4.write(0);

lcd.begin(16, 2);

lcd.print("ORDER PLEASE..");

pinMode(1,OUTPUT);

pinMode(0,OUTPUT);

}

void loop()

{

 char customKey = customKeypad.getKey();

  if (customKey){

  Serial.println(customKey);

  if(customKey == '1')

  {

   lcd.setCursor(0, 0);
```

```
lcd.print(" WELCOME BP!!");

delay(2000);

lcd.clear();

bp1.write(90);

delay(1000);

bp1.write(0);

delay(2000);

digitalWrite(led1,HIGH);

delay(200);

digitalWrite(led1,HIGH);

delay(200);

lcd.setCursor(0, 0);

lcd.print(" Preparing your");

lcd.setCursor(0, 1);

lcd.print("    Drink 2");

delay(10000);

lcd.clear();
```

```arduino
   digitalWrite(led1,LOW);

   delay(2000);

   digitalWrite(led,HIGH);

   tone(buzzer,1000);

   lcd.setCursor(0, 0);

   lcd.print("STAY HEALTHY!!!!");

   delay(2000);

   digitalWrite(led,LOW);

   delay(2000);

   noTone(buzzer);

 delay(2000);

  lcd.clear();

  lcd.print("ORDER PLEASE..");

}

else if(customKey == '3')

{

  lcd.setCursor(0, 0);
```

```
lcd.print(" WELCOME BP!!");

delay(2000);

lcd.clear();

bp3.write(90);

delay(2000);

bp3.write(0);

delay(2000);

digitalWrite(led1,HIGH);

delay(200);

lcd.setCursor(0, 0);

lcd.print(" Preparing your");

lcd.setCursor(0, 1);

lcd.print("    Drink 3");

delay(10000);

lcd.clear();

digitalWrite(led1,LOW);

delay(2000);
```

```arduino
  digitalWrite(led,HIGH);

  tone(buzzer,1000);

   lcd.setCursor(0, 0);

  lcd.print("STAY HEALTHY!!!!");

  delay(2000);

  digitalWrite(led,LOW);

  delay(2000);

   noTone(buzzer);

 delay(2000);

  lcd.clear();

  lcd.print("ORDER PLEASE..");

 }

 else if(customKey == '4')

 {

  lcd.setCursor(0, 0);

  lcd.print(" WELCOME BP!!");

  delay(2000);
```

```
lcd.clear();

bp4.write(90);

delay(2000);

bp4.write(0);

delay(2000);

digitalWrite(led1,HIGH);

delay(200);

lcd.setCursor(0, 0);

lcd.print(" Preparing your");

lcd.setCursor(0, 1);

lcd.print("    Drink 4");

delay(10000);

lcd.clear();

digitalWrite(led1,LOW);

delay(2000);

digitalWrite(led,HIGH);

tone(buzzer,1000);
```

```
lcd.setCursor(0, 0);

lcd.print("STAY HEALTHY!!!!");

delay(2000);

digitalWrite(led,LOW);

delay(2000);

noTone(buzzer);

delay(2000);

lcd.clear();

lcd.print("ORDER PLEASE..");

}

else if(customKey == '5')

{

lcd.setCursor(0, 0);

lcd.print(" WELCOME BP!!");

delay(2000);

lcd.clear();

bp1.write(90);
```

```
bp2.write(90);

delay(2000);

bp1.write(0);

bp2.write(0);

delay(2000);

digitalWrite(led1,HIGH);

delay(200);

lcd.setCursor(0, 0);

lcd.print(" Preparing your");

lcd.setCursor(0, 1);

lcd.print("    Drink 5");

delay(10000);

lcd.clear();

digitalWrite(led1,LOW);

delay(2000);

digitalWrite(led,HIGH);

tone(buzzer,1000);
```

```
    lcd.setCursor(0, 0);

    lcd.print("STAY HEALTHY!!!!");

    delay(2000);

    digitalWrite(led,LOW);

    delay(2000);

    noTone(buzzer);

    delay(2000);

    lcd.clear();

    lcd.print("ORDER PLEASE..");

  }

 else if(customKey == '6')

 {

    lcd.setCursor(0, 0);

    lcd.print(" WELCOME BP!!");

    delay(2000);

    lcd.clear();

    bp1.write(90);
```

```
bp3.write(90);

delay(2000);

bp1.write(0);

bp3.write(0);

delay(2000);

digitalWrite(led1,HIGH);

delay(200);

lcd.setCursor(0, 0);

lcd.print(" Preparing your");

lcd.setCursor(0, 1);

lcd.print("    Drink 6");

delay(10000);

lcd.clear();

digitalWrite(led1,LOW);

delay(2000);

digitalWrite(led,HIGH);

tone(buzzer,1000);
```

```
  lcd.setCursor(0, 0);

 lcd.print("STAY HEALTHY!!!!");

 delay(2000);

digitalWrite(led,LOW);

 delay(2000);

 noTone(buzzer);

delay(2000);

 lcd.clear();

 lcd.print("ORDER PLEASE..");

}

else if(customKey == '7')

{

 lcd.setCursor(0, 0);

 lcd.print(" WELCOME BP!!");

 delay(2000);

 lcd.clear();

 bp1.write(90);
```

```
lcd.setCursor(0, 0);

lcd.print(" Preparing your");

lcd.setCursor(0, 1);

lcd.print("    Drink 9");

delay(10000);

lcd.clear();

digitalWrite(led1,LOW);

delay(2000);

digitalWrite(led,HIGH);

tone(buzzer,1000);

lcd.setCursor(0, 0);

lcd.print("STAY HEALTHY!!!!");

delay(2000);

delay(2000);

lcd.clear();

lcd.print("ORDER PLEASE..");

lcd.print(" Preparing your");
```

```
  lcd.print("    Drink 8");

 delay(10000);

 lcd.clear();

digitalWrite(led1,LOW);

 delay(2000);

 digitalWrite(led,HIGH);

 tone(buzzer,1000);

 lcd.setCursor(0, 0);

 lcd.print("STAY HEALTHY!!!!");

 delay(2000);

 digitalWrite(led,LOW);

 delay(2000);

 noTone(buzzer);

 delay(2000);

 lcd.clear();

}

}}
```