

IOT BASED SMART SHOPPING CART USING RFID FOR THE BLIND PEOPLE

Submitted in partial fulfillment of the requirements for the award of

Bachelor of Engineering Degree in
Electrical and Electronics Engineering

By

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SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

Accredited with Grade "A" by NAAC

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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the Bonafide work of **AJITHKUMAR A** (Register No.37140004) & **BALASHANKAR M** (Register No. 37140013) who carried out the project entitled "**IOT BASED SMART SHOPPING CART USING RFID FOR THE BLIND PEOPLE**" under our supervision from December 2020 to April 2021.

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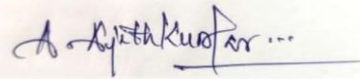
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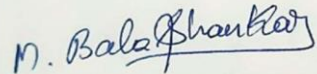
DECLARATION

We **AJITHKUMAR A** (Register No. **37140004**) & **BALASHANKAR M** (Register No. **37140013**) hereby declare that the Project Report entitled “**IOT BASED SMART SHOPPING CART USING RFID FOR THE BLIND PEOPLE**” done by us under the guidance of **Dr. V. SENTHIL NAYAGAM** is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in Electrical and Electronics Engineering.

1.



2.



SIGNATURE OF THE CANDIDATES

DATE:14.4.2021

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ABSTRACT

- This project helps the visually impaired people in collecting their groceries.
- Raspberry pi is deployed in the robot module(trolley) along with RFID reader, headset, motors.
- The voice of the person (section where the person wants to go) is taken as input and this input is communicated via Bluetooth to Raspberry pi.
- According to the requirement, the Raspberry will provide the command to driver IC, which in turn will drive the motors to that direction.
- In the section, all items will have RFID tags. Whenever an item is picked and dropped into the trolley, the RFID reader will detect (read) the tag. This will be communicated to Raspberry Pi and the Raspberry Pi will provide audio output (item name and its price) through headset to the person.
- Also, all the items that are in trolley are recorded in list and are printed at the bill section.

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CHAPTER 1

INTRODUCTION

GENERAL INTRODUCTION:

Every shopping center provides searching trolley car to the shoppers to pick the merchandise from the shop and place that product within the streetcar. Additionally, they have to maneuver towards asking counter for the asking purpose and client have to be compelled to wait inside the long queue for his flip. the good streetcar that consists of raspberry pi device, barcode scanner and digital display bit screen can facilitate the client to avoid wasting his time throughout the bill payment at the bill counter. normally as modish of currently searching has become associate integral a part of today's society. we'll see a vast rush at the mall and supermarkets throughout weekends, holiday's and sales. Major concern for the client at mall and market happens once there's a protracted waiting queue at the asking counter. client tends to go away the queue instead of standing for hours at the asking counter this seems to be a hassle for the mall and market owner. So, the machine-controlled searching streetcar that shut with a Universal Product Code scanner and slightly screen show is meant which could facilitate the client to shop for their merchandise inside the mall and market while not being served by a sales associate.

each product within the market can have a Universal Product Code the client can decide the merchandise scan the barcode with the assistance of barcode scanner connected to the searching streetcar. once scanning the barcode, the main points and also the worth of the merchandise are showed on the bit screen display at the side of the whole bill of the things purchased. This technique would even be helpful for the client with bound budget limit and saves long waiting time at the asking counter.

LITERATURE SURVEY:

- [1] K P Vidya, K.M Swathi, D Chaitra, S.H Jayalakshmi, M V Manoj Kumar, H R Sneha, Likewin Thomas, **"Virtual Cart: Novel Approach for Revamping Smart Shopping Experience"** . This paper proposes smartphone application named Virtual Cart for facilitating a straightforward and convenient technique

for buying in searching malls. Nowadays, because of the life-style and demands, majority of persons have become more and more occupied, want of the hour is to induce all personal works done simply with minimum effort and time-consumption. searching at malls could be a often dispensed activity in. There is an enormous rush at malls on holidays, weekends particularly throughout special offers and discounts. distinction to searching in malls, individuals like on-line searching to induce needed things through Amazon, Flipkart and Snapdeal etc., wherever they can not have the planning and feel of things unless they receive the delivery. So, to unravel this downside we've planned Virtual Cart, victimisation that, one will overcome the complications of on-line and offline searching by guaranteeing a far better searching expertise.

[2] Ria Singh, Satyam Verma, Ms. Krit, **"RFID and IR based Smart Shopping Mart Management System"**. This paper outlines the event of good looking complicated that deals with the position and extraction of product within the handiest approach within the rural areas of India. {the goods|the product} placement relies on effective area and value management that helps for each on-time and on-line looking of products that eliminates the standard manual system of purchase in India looking centers. The image uses associate extended shelf system which will be used for on-time looking at one facet and another facet for stock filling and takes up for on-line looking booking. RFID code system is employed to present identity to every product that defines its placement coordinate. product area unit placed on a conveyer and also the 3 motors get the mathematician command from the RFID code scan and move the merchandise to the outlined position.

[3] Stephanie Van Hove, Anissa All, Lieven De Marez, **"Short on Time? Context-Aware Shopping Lists to the Rescue: an Experimental Evaluation of a Smart Shopping Cart"**. Grocery searching is taken into account a task-oriented and rather unexciting activity. However, the experiential potential of grocery stores continues to be not absolutely exploited. The introduction of in-store technologies, like sensible searching carts, caters to dynamical client behavior. Through an experiment in an exceedingly demo grocery (N = 60), this study investigates the epicurean and utilitarian searching worth of a

context-aware searching list and its perceived quality. The results incontestable that employing a context-aware searching list leads to higher epicurean and utilitarian worth compared to searching with a paper searching list. This study conjointly wanted to see whether or not system latency impacts product quality perception of the sensible go-cart. Product quality perception didn't take issue considerably by level of system latency. These insights imply that the investment in in-store technologies is effective because it leads to period gratification.

- [4] Tharindu Athauda, Juan Carlos Lugo Marin, Jonathan Lee, Nemai Chandra Karmakar, **“Robust Low-Cost Passive UHF RFID Based Smart Shopping Trolley”**. Retailers are usually curious about cheap mechanisms to take care of stocks similarly as for tracing product across the availability chain in AN economical and effective manner. additionally, theft is another concern long-faced owing to the dearth of effectiveness in product tracing technique like “barcode” employed in retail super markets. “AmazonGo” a wise retail layout that was introduced by Amazon, to handle on top of problems was found to be inefficient thanks to the over dependency of system supported historical purchased patterns of shoppers.
- [5] Himani Pangasa, Shipra Aggarwal, **“An Analysis of Li-Fi based Prevalent Automated Billing Systems in Shopping Malls”**. At mega malls, for grocery looking and buy of daily wants artefacts, customers should wait in extended queues for the asking resulting in wastage of their precious time. to unravel this downside, totally different researchers have projected automation in asking system. once patron picks up an object and drops it into the cart, the scanner scans the artefact's distinctive code and its worth, that is flaunted on the video display of the tram. once client has consummated with the acquisition, patron goes to the asking counter and pay the full bill that was shown on the video display incorporated on the cart. during this paper, a trial has been created to analyse the connected works dole out by varied researchers during this field supported the most elements of good cart like microcontroller, transmission medium and scanning system.

- [6] Thomas Arciuolo, Abdel-shakour Abuzneid, “**Simultaneously Shop, Bag, and Checkout (2SBC-Cart): A Smart Cart for Expedited Supermarket Shopping**”. Currently food market searching is incredibly labour-intensive, with recurrent loading and unloading of products in and out of the pushcart. the most plan of the work bestowed during this paper is to outline a radically new methodology for food market searching, eliminating all recurrent handling of product, within the method of loading product in and out of the pushcart, for the needs of product searching, bagging, and cashier checkout.
- [7] Ashutosh Walimbe, Vikrant Pagnis, Akshit Alva, ASidhesh Balapure, Madhuri Karnik, “**A Survey Paper on Smart Trolley Using RFID Technology**”. Bharat is one amongst the quickest growing economies within the world and aspires to become a five trillion greenback economy. E-commerce has for sure unfold itself and there are several advancements during this field. The socio-economic class and most of our community prefers to travel to malls or supermarkets and acquire their looking done. because of increasing populations, looking may be a cumbersome method collectively should wait in long queues to urge their process done. Clearly, it's a waste of your time and a tedious affair. the most important drawback lies with the system of barcodes wherever each item is being scanned on an individual basis that makes the method slow and time intense. RFID primarily based go-cart may be a new manner of looking and avoiding long queues. the article would be labeled with a novel reader tag, which can be known by the RFID reader hooked up to the self-propelled vehicle because the object is supplementary to the cart. because the scanning is completed the value of the merchandise can mechanically be displayed on the screen hooked up to the cart. The bill worth changes dynamically because the objects ar supplementary and deducted.
- [8] Srinidhi Karjol, Anusha K. Holla, C. B. Abhilash, “**An IOT Based Smart Shopping Cart for Smart Shopping**”. Today's world incorporates a aggressive population with a good vary of demand from a range of domains.

Customers World Health Organization have to be compelled to purchase totally different merchandise in Walmart or supermarkets wants several time and patience in coordinating among them self for productive searching. we'd like to deal with this downside by efficiently victimization our technologies. within the advancement of technologies, the globe is obtaining automatic in several aspects. during this Paper, we tend to depict affordable and cost-efficient sensible handcart utilizing IoT (Internet of Things) innovations. Such a framework is acceptable to be used in spots like Walmart & supermarkets, wherever it will facilitate in alteration work and in creating a superior searching data for the purchasers. instead of instead of purchasers to take a seat tight during a long line for watching their shopped things, this framework helps in mechanizing the simple and cozy charge method. The searching is processed with 2 aspects, with a predefined list and random searching. Our projected system provides the closest route to pick-up the listed things gift in several racks of the Walmart. Also, with the superimposed feature we've got Associate in Nursing approach wherever Cart-to-Cart communication is changed that permits a client to share their searching list with co-shopper to enable parallel searching victimization 2 or additional carts. These options save time and create searching simple. along side these talents, this method style is additionally capable of detection stealing by shoplifters. additionally, the Walmart or grocery management are going to be able to analyze the searching behaviors of assorted customers to make valuable business insights. These are going to be are going to be for the retail stores. consequently, the management team can have the flexibility to predict the speed of sales of all individual merchandise and create the stock out there is predicated on the continued client needs. Overall, this method can make sure that the shoppers can have the simplest searching expertise and extremely typically, they visit the Walmart for the look.

- [9] Dipayan Sinha, Dipayan Sinha, Keerthan Bhat H, Guruprasad C, Badari Nath K, “**Automated Billing System using RFID and Cloud**”. The hassle of queues in retailers, human errors in manually generated bills and also the wastage of your time within the packaging of merchandise once searching creates

inconvenience to shoppers and eventually ends up in lower client satisfaction levels. This paper discusses the look of a searching system wherever the purchasers drop merchandise into a tram that has Associate in Nursing RFID reader to scan the RFID tags related to merchandise. once completion of searching, customers will exit the search with their bills subtracted mechanically from their e-Wallet. RFID technology has been incorporated with IR sensors to be able to accurately find and verify whether or not a product has entered the cart or not. A Django internet Application is hosted on Associate in Nursing AWS EC2 instance to permit customers to stay track of their transactions. The RFID system is connected to a Raspberry Pi with intrinsic Wi-Fi to speak with Associate in Nursing Amazon RDS MySQL instance that stores the inventory of the business establishment alongside the costs of the merchandise. It conjointly stores this thing within the cart and also the history of previous transactions of each client. Associate in Nursing elaborate discussion of the present system, the design of the enforced system, and results has been enclosed during this paper. A future style employing a ring-based RFID reader to hide the complete cart and make sure that any RFID tag among the region is scanned has been mentioned. This style is integrated with a weight mat as an extra validation mechanism.

- [10] Ravindra Jogekar, Ruchita Ghodeswar, Payal Kadu, “**Automated Shopping Trolley System Using Raspberry Pi Device**”. As the technology is developing day by day, searching malls ought to be capable of handling the group neatly. each store provides searching trolley car to the shoppers to pick out the merchandise from the shop and place that product within the trolley car. more they need to maneuver towards request counter for the request purpose and client got to wait within the long queue for his flip. the good trolley car that carries with it raspberry pi device, barcode scanner and LCD bit screen can facilitate the client to save lots of his time throughout the bill payment at the bill counter.
- [11] Priyanka S. Sahare, Anup Gade, Jayant Rohankar, “**Automated Smart Trolley System Using Raspberry PI Device**”. Regardless of the distance of E-business people generally purchase varied things simply from markets and

looking centers for the aim of their own fulfilment. Among the troubles baby-faced by the purchasers one downside is to pursue line through the asking procedure. though their goal is solely to urge a handful of things, holding on to beaked things devours time. consistent with our review money and traditional time spent on each consumer is high, notably in packed grocery stores. The business individuals ar ready to welcome any machines that mechanize the asking procedure to decrease labour and time spent for that procedure. The principle purpose is to fulfil the wants of the consumer and moreover scale back the time spent on the asking procedure that is to complete the asking method within the tram rather than waiting in a very line for a handful of things.

[12] R.N. Jogekar, A. Kadav, R. Ghodeswar, P. Chavhan, P. Kadu, M. Paunikar, **“Automated Shopping Trolley Using Raspberry Pi Device”**. With the event of wireless technology their square measure numerous fields whereby we will use this technology and use of wireless technology is favorable currently a day. during this paper we have a tendency to gift our views on an automatic looking self-propelled vehicle victimization raspberry pi device combined with code scanner and LCD display. As we all know that in sales and holidays, we have a tendency to observe rush at supermarkets and thanks to this asking method becomes longer overwhelming and client cannot indicate too long in an exceedingly queue for asking purpose therefore, here we will make use of the automatic looking self-propelled vehicle that has barcode scanner, raspberry pi and LCD display. victimization this self-propelled vehicle the client can self-scan the merchandise by himself and prepare the bill. Hence, there'll be no long queue within the grocery at asking counter for asking purpose.

[13] M.Banusundareswari, R.Santosh Vishnu, G.Gowshik, S.Prakash, S.Aravinth, **“Automation Of Shopping Cart Using Raspberry Pi”**. Specially, it becomes a lot of jammed on holidays. individuals purchase totally different things within the malls and puts them within the self-propelled vehicle. At the money counter request method is completed exploitation code scanner. this is often terribly long method. To avoid this, we tend to ar developed a system that is named as Automation of pushcart exploitation Smartphone. during this system we tend to ar exploitation RFID tags rather than barcodes. This RFID

tags are going to be on the merchandise. Whenever the client puts a product into self-propelled vehicle it'll get scanned by RFID reader and products value and price are going to be show on LCD display. Like this the method goes on. The self-propelled vehicle follows United States of America with none human effort. We are employing a GSM transmitter which can be at self-propelled vehicle that is employed to transfer the information to Mobile. In sensible self-propelled vehicle app, the number are going to be sent and therefore the payment is going to be done exploitation mobile. If someone interrupts apart from the user there's collision detector to point.

- [14] Sakorn Mekruksavanich, **“Design and Implementation of the Smart Shopping Basket Based on IoT Technology”**. Currently, throughout holidays and weekends in urban areas, a large range of shoppers will be seen situation into searching malls and supermarkets. once there ar special offers and large discounts, the quantity of individuals will increase even additional. In supermarkets of late, shoppers want a cart or basket once creating their purchases of varied things. additionally, the method of procuring the merchandise is very sophisticated because the shoppers should carry a basket anytime anytime the merchandise they need and place them into the basket, followed by desirous to modify the calculation of the expenses. when finishing their searching list, the shoppers should wait in a very long line so they'll check up on and pay the bill. As a result, to unravel this drawback, this analysis presents the event of a wise basket that's used for searching. All the merchandise within the grocery ordinarily have a barcode tag. Therefore, a barcode reader of golem sensible phone are going to be enclosed on the sensible basket. during this approach, the name and also the value of every item are going to be shown on the show of the itinerant once the client scans and places the merchandise within the basket. the whole bill are going to be intercalary up to allow the whole value of all the purchases and hold on to the memory of the microcontroller. the merchandise data concerning the things contained within the basket are going to be transferred to the most laptop via a transmitter. Moreover, validation of the accuracy of the searching method are going to be performed by a weight sensing element system designed into the

basket. Thus, waiting in line to examine out and pay the bill whereas having to estimate the whole value are going to be avoided.

[15] Akindele E. Ayoola, IAENG Awodeyi I. Afolabi, Victoria W. Oguntosin, Olaitan A. Alashiri, Victor O. Matthews, IAENG, Odunayo O. Akande, **“Development of an Intelligent Smart Shopping Cart System”**. It has been determined that Supermarkets witness long queues throughout the height of searching amount. These long queues have resulted within the loss of your time each for the patrons and therefore the mall attendants. Hence, the goal of this paper is to style Associate in Nursing develop an Intelligent sensible pushcart with the only objectives of minimizing searching time and to maximize searching expertise in a very grocery store. This paper presents Associate in Nursing Intelligent sensible pushcart System wherever the entire quantity the consumer desires to pay is imputed into the mini system embedded within the sensible pushcart. every product picked has Associate in Nursing RFID tag that has Associate in Nursing appointed value. once the merchandise born within the sensible pushcart reaches the utmost input quantity or exceeds the utmost input quantity, the red visual indicator starts to blink and therefore the buzzer beeps to apprise the patrons of Olympian the worth limits whereas searching. The inexperienced visual indicator additionally blinks once a consumer outlet below the imputed quantity. If any product is far from the sensible pushcart, the number is subtracted from the developed mini system embedded within the sensible pushcart {and Theban therefore the and additionally the} buzzer also beeps to apprise the consumer of the deduction. The elements used for this analysis area unit RFID Tag, RFID Reader, liquid show (LCD), Push buttons/Switch, button, Visual Indicator, Wi-Fi module, and a PIC microcontroller.

[16] Mr. K. Raj Thilak, Mr.W. Rajan Babu, Ms.J. Anupama, Ms.P. Pradeepa, Ms.K. Roshini, Ms. Swetha Ashok, **“IntCart for Easy Shopping in Supermarkets using Raspberry Pi and RFID”**. Int cart is associate degree economical technique, as a result of looking is rarely thought-about to be a straightforward task instead of waiting during a request counter that could be a tedious task. Preparation of bill victimization barcode scanner by a cashier is

time overwhelming thus employing a RFID scanner within the cart itself that's interfaced with method|the method}or allows the technology to ease the process. because the shopper adds a lot of things it's detected by scanner module and worth keeps increasing. If the client doesn't wish any product other already, the value is subtracted. once the looking is complete, shopper presses the button, and every one the costs square measure other, and bill is communicated to the itinerant. So, either on-line payment or money payment is created victimization the bill that has been generated. Hence, this technique is appropriate to be used in places like market wherever it will facilitate in reducing hands and a more robust looking expertise for its customers.

- [17] Hiba Sadia, Shubhansu Jee, Krishnendu Pal, Shikhar Singh, Mebansharai Marbaniang, **"Iot Application Based Advanced Shopping Trolley"**. Reducing the time consumed whereas waiting in long queues throughout the checkout method in an exceedingly market is one in every of the core objectives in up the looking expertise of shoppers. during this paper we have a tendency to propose the employment of RFID embedded with the handcart to style a wise looking system. All the looking carts within the mall are plus RFID tags. once a product that conjointly has associate degree RFID, tag is placed within the cart the asking data with relation to that cart is updated by reading the small print of the several products. the shops are put in with good shelves that also are plus RFID readers. this may facilitate in maintaining a list of all the merchandise within the mall and therefore improve stock maintenance. additionally, to the current setting, associate degree LCD display is additionally put in within the cart that displays the small print of obtainable merchandise in this cart and therefore the overall value of all the things. A mobile purpose of Sale is maintained within the cart so the client will build the payment while not having to attend in an exceedingly long queue for the checkout method. All the processed data is maintained in an exceedingly info so or not it's used for analytical functions within the future.

- [18] Dhavale Shraddha D, DhokaneTrupti J, Shinde Priyanka S, **"IOT Based Intelligent Trolley for Shopping Mall"**Now a day's searching at massive malls may be a daily activity in underground cities. One will see immense rush at

malls on holidays and on special discounts days. individuals purchase completely different things and place them in trolley car & attend asking counter for payments. At the asking counter the cashier prepares the bill victimization Universal Product Code reader. Aim of this task is to develop a system that may be used solve the above-named challenge. The system with RFID tags are going to be placed all told the trolleys. All the product within the mall is going to be equipped with RFID tags. once someone puts any product within the trolley car, its code is going to be detected and also the value of these product is going to be hold on in memory, its name and value are going to be displayed on LCD and can be sent to asking Counter by wireless modules. Also, this whole info is going to be sent through LAN module to web. Also, we tend to use psychic phenomenon methodology that is useful to owner.

- [19] Mobeen Shahroz, Muhammad Faheem Mushtaq, Maqsood Ahmad, Saleem Ullah, Ar If Mehmood, And Gyu Sang Choi, **“IoT-Based Smart Shopping Cart Using Radio Frequency Identification”**. The modern age of technology during which most of the client has to wait within the grocery store for searching as a result of it's a extremely long method. an enormous crowd within the grocery store at the time of discount offers or weekends makes hassle to attend in long queues as a result of a barcode-based asking method. during this regard, the web of Things (IoT) based mostly sensible cart is projected that consists of oftenness Identification (RFID) sensors, Arduino microcontroller, Bluetooth module, and Mobile application. RFID sensors depend upon wireless communication. One half is that the RFID tag connected to every product and therefore the alternative is RFID reader that reads the merchandise the merchandise. After this, every product data shows within the Mobile application. The client simply manages the searching list in Mobile application in keeping with preferences. Then searching data sends to the server wirelessly and mechanically generates asking. This experimental image is meant to eliminate long searching method and quality of services problems. The projected system will simply be enforced and tested at an advertisement scale beneath the important situation within the future. that's why the projected model is additional competitive as compared to others.

[20] Akshay Kumar, Abhinav Gupta, S Balamurugan, S Balaji and Marimuthu R, “**Smart Shopping Cart**”. This paper targeted to cut back the Queue at a charge counter in a very looking complicated. The system will a similar by displaying the full worth of the merchandise unbroken within the cart. during this method the client will directly pay the quantity at the charge counter and leave with the commodities he/she has bought. It eliminates the normal scanning of merchandise at the counter and successively races the complete method of looking, additionally with this technique the client shall apprehend the full quantity to be paid and thus will consequently arrange his looking solely shopping for the essential commodities leading to increased savings. Since the complete method of charge is machine-driven it reduces the chance of human error well. Also, the system contains a feature to delete the scanned merchandise to additional optimize the looking expertise of the client. The hardware for the take a look at run relies on the Arduino platform and Xbee modules, as each area unit vastly in style in small-scale analysis and wireless automation resolution.

SCOPE OF THE PROJECT:

This project helps the visually impaired people in collecting their groceries. Raspberry pi is deployed in the robot module(trolley) along with RFID reader, headset, motors. The voice of the person (section where the person wants to go) is taken as input and this input is communicated via Bluetooth to Raspberry pi. According to the requirement, the Raspberry will provide the command to driver IC, which in turn will drive the motors to that particular direction. In the section, all things can have RFID tags. Whenever item is picked and kept into the trolley, the RFID reader can find (read) the tag. This will be communicated to Raspberry Pi and the Raspberry Pi will provide audio output (item name and its price) through headset to the person. Also, all the items that are in trolley are recorded in IOT and are printed at the bill section.

ADVANTAGES OF PROPOSED SYSTEM:

Accurate, complete data collection and Better utilization of employee's time.

There are five major areas where RFID can be effectively used in a port cargo terminal:

1. Access Control
2. Container Security
3. Container Identification and Location
4. Activity Tracking
5. Regulatory Compliance
6. Low cost
7. Maintenance is easy no need of human interference.

It can do its job automatically and shopping is made easy. To provide an easy and comfortable way for the visually impaired people to shop at the supermarkets.

APPLICATION OF THE PROPOSED TECHNIQUE:

- ❖ Super Market's
- ❖ Shopping Centre's

CHAPTER 2

PROJECT DESCRIPTION

CONCEPT EXPLANATION OF EXISTING SYSTEM:

The process in malls with facilitate of barcode scanner. Merchandiser scan the merchandise through the barcode scanner. this is often to be a slow method and client needs to await long queues. the present system uses the fast Response code (QR code) technology is enforced to spot the merchandise. The audio directions will assist them inside the food market supported real-time things. this technique is to eliminate others support for visually impaired people in searching and provide them a convenient and complex atmosphere. On implementing this technique, it facilitates blind individuals searching, saves the customer's time and promotes business sales.

CONCEPT EXPLANATION OF PROPOSED SYSTEM:

The planned methodology is that the automated charge for a consumer throughout looking supported RFID supported with completely different straightforward technologies. In searching malls or supermarkets, the product area unit equipped RFID tags instead of barcodes.

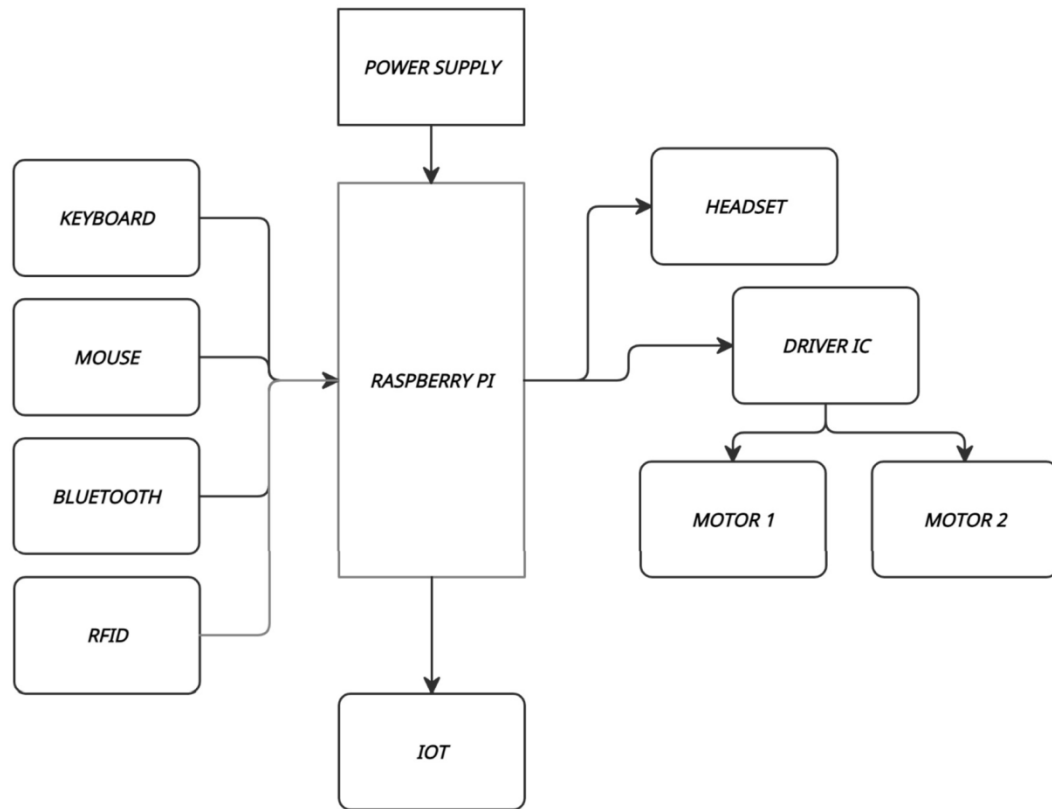


FIG 2.1 BLOCK DIAGRAM OF IOT BASED SMART SHOPPING CART USING RFID FOR THE BLIND PEOPLE'S

HARDWARE REQUIREMENTS:

- Raspberry pi
- Bluetooth
- RFID reader
- IOT (node mcu)
- Driver ic
- Motor

RASPBERRY PI:

The Raspberry Pi may even be a low price, credit-card sized laptop that plugs into a laptop computer monitor or TV and uses a typical keyboard and mouse. It's a capable very little device that allows individuals of all ages to explore computing, and to hunt out the due to program in languages like Scratch and Python. It is going to do everything you'd expect a personal computer to try to to and do, from browsing Infobahn and enjoying high-definition video, to creating spreadsheets, word-processing, and enjoying games.

central process unit - Quad-core 64-bit ARM Cortex A53 clocked at one.2 GHz, GPU - 400MHz Video Core IV transmission, Memory - 1GB LPDDR2-900 SDRAM (i.e., 900MHz), USB ports is four, Video outputs - HDMI, composite video (PAL and NTSC) via three.5 mm jack, Network - 10/100Mbps native space network and 802.11n Wireless native space network, Peripherals - seventeen GPIO and specific functions, and HAT ID bus, Bluetooth - four.1, Power provide is five V via little USB or GPIO header and therefore the size is eighty five.60mm × 56.5mm and weight is regarding 45g (1.6 oz)



FIG 2.2 RASPBERRY PI

BLUETOOTH:

- The Bluetooth Module is that the newest Bluetooth wireless serial cable! This version of the popular Bluetooth uses the HC – 05 / 06 modules.
- Any serial stream from 9600 to 115200 bits per second square measure usually passed seamlessly from your microcontroller to your target. The remote unit is also high-powered from 3.3 V up to 5 V for straightforward battery attachment.
- All signal pins on the remote unit square measure 3 V – 5 V tolerant. No level shifting is required. do not attach this device on to a interface.
- You will wish associate RS232 to TTL converter circuit or Arduino XBee USB Adapter if you'd prefer to connect this to a portable computer. you will be able to either solder a 6-pin header or individual wires. Please see connected male and female pins below.

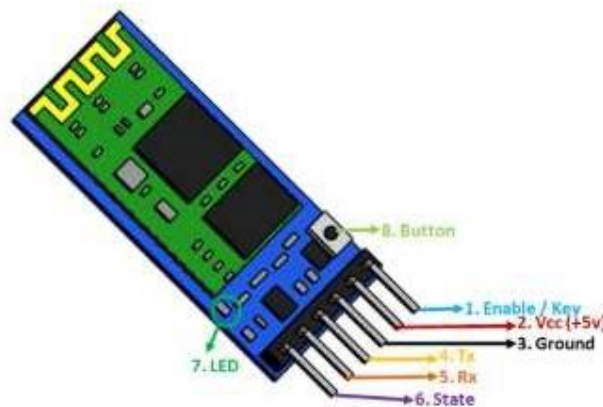


FIG 2.3 BLUETOOTH MODULE

Specification:

1. Bluetooth protocol: Bluetooth Specification v2.0+EDR
2. Power supply: +3.3V-5V DC 50mA

3. Profiles: Bluetooth serial port TTL out
4. Frequency: 2.4GHz ISM band
5. Modulation: GFSK (Gaussian Frequency Shift Keying)
6. Sensitivity: $\leq -84\text{dBm}$ at 0.1% BER
7. Security: Authentication and encryption
8. Working temperature: $-20 \sim +75$ Centigrade
9. Dimension: 26.9mm x 13mm x 2.2 mm

RFID Reader:

- i. Radio frequency identification (RFID) has been utilized in a number of sensible applications, like rising offer chain management, following home pets, accessing workplace buildings, and dashing up toll assortment on roadways..
- ii. RFID is employed to mechanically determine folks, objects mistreatment short vary radio technology to speak digital info between a stationary location(reader) and a movable object(tag).
- iii. RFID technology is accustomed track merchandise in an exceedingly manner just like mistreatment bar codes for product identification, however RFID conjointly carries further edges.
- iv. It doesn't need line of sight to browse the tag, features a longer browse vary than Universal Product Code reader, and tags will store a lot of knowledge than bar codes.
- v. Reader will at the same time communicate with multiple tags.

- vi. This feature might permit customers to pass foodstuff checkout counters. whereas a reader identifies all things in an exceedingly cart at a similar time, rather than scanning every Universal Product Code one by one.



FIG 2.4 AN RFID READER

IOT (node mcu):

- i. ESP8266 offers a complete and self-contained Wi-Fi networking resolution, allowing it to either host the appliance or to dump all Wi-Fi networking functions from another application processor.
- ii. Once ESP8266 hosts the appliance, and once it is the sole application processor among the device, it's able to boot up directly from associate external flash.
- iii. It's integrated cache to reinforce the performance of the system in such applications, and to scale back the memory wants.
- iv. Alternately, serving as a Wi-Fi adapter, wireless net access is also superimposed to any microcontroller-based style with property property through UART interface or the processor AHB bridge interface.

Features:

- i. SDIO 2.0, SPI, UART
- ii. 32-pin QFN package

- iii. Integrated RF switch, balun, 24dBm PA, DCXO, and PMU
- iv. Integrated RISC processor, on-chip memory and external memory interfaces
- v. Integrated MAC/baseband processors
- vi. Quality of Service management
- vii. I2S interface for high fidelity audio applications
- viii. On-chip low-dropout linear regulators for all internal supplies
- ix. Proprietary spurious-free clock generation architecture
- x. Integrated WEP, TKIP, AES, and WAPI engines

Driver IC



FIG 2.5 L293D DRIVER IC

- i. The L293D motor driver is accessible for providing User with ease and easy interfacing for embedded application.
- ii. The pins of L293D motor driver IC are unit connected to connectors for simple access to the motive force IC's pin functions.
- iii. The L293D may be a twin Full Bridge driver that may draw close to 1Amp per bridge with provide voltage up to 24V.
- iv. It will drive 2 DC motors, relays, solenoids, etc. The device is TTL compatible.

- v. 2 H bridges of L293D is connected in parallel to extend its current capability to a pair of Amp.

Features:

- i. Easily compatible with any of the system.
- ii. Easy interfacing through FRC.
- iii. External Power offer pin for Motors supported.
- iv. Onboard H-Bridge base Motor Driver IC (L293D).
- v. Onboard PWM choice switch.
- vi. 2pin Terminal Block (Phoenix Connectors) for simple Motors affiliation

Motor:

- i. Straightforward to use affordable motor for AI application. Nut for mounting motor firmly on body/chassis of mechanism. Internally rib hole on shaft for simple mounting of wheels by using screws.
- ii. A DC motor is any of a category of rotary electrical machines that converts DC power into mechanical energy.
- iii. The foremost common varieties believe the forces made by magnetic fields.
- iv. Nearly all kinds of DC motors have some internal mechanism, either mechanical device or electronic, to sporadically amendment the direction of current partially of the motor.
- v. DC motors were the primary kind of motor wide used, as they may be high-powered from existing direct-current lighting power distribution systems.
- vi. A DC motor's speed are often controlled over a good vary, using either a variable supply voltage or by changing the strength of current in its field windings.

CHAPTER 3

EMBEDDED SYSTEM

INTRODUCTION

An embedded system is a controller programmed and controlled by a real-time operating system (RTOS) with a zealous perform among a bigger mechanical or electrical system, typically with real-time consumption of embedded systems computing constraints. It is embedded as a part of a whole device typically as well as hardware and mechanical parts.

Embedded systems management several devices in common use these days. Cardinal percent of all microprocessors are factory-made to function embedded system component.

Examples of properties of typical embedded computers compared with general-purpose counter parts are low power consumption, small size, rugged operational ranges, and low per-unit value. This comes at the value of restricted process resources, which make them considerably tougher to program and to act with.

However, by building intelligence mechanisms on prime of the hardware, taking advantage of doable existing sensors and also the existence of a network of embedded units, one can both optimally manage out there resources at the unit and network levels likewise as provide increased functions, well on the far side those out there. For example, intelligent techniques is designed to manage power.

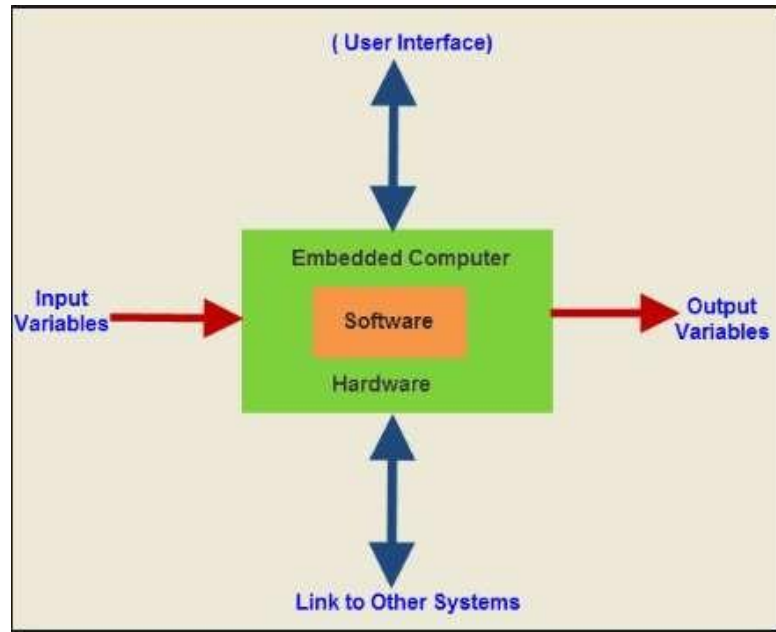


FIG 3.1 GENERAL CONCEPT OF EMBEDDED SYSTEM

Embedded computer assembly for Electronic mechanical device.

Embedded systems voting machine usually found in shopper, industrial, automotive, medical, industrial and military applications.

Telecommunications systems use varied embedded systems from telephone switches for the network to cell phones at the tip user. pc networking uses dedicated routers and network bridges to route information.

Consumer electronics include MP3 players, mobile phones, computer game consoles, digital cameras, GPS receivers, and printers. family appliances, such as microwave ovens, laundry machines and dishwashers, embrace embedded systems to supply flexibility, potency and options.

CLASSIFICATION OF EMBEDDED SYSTEM

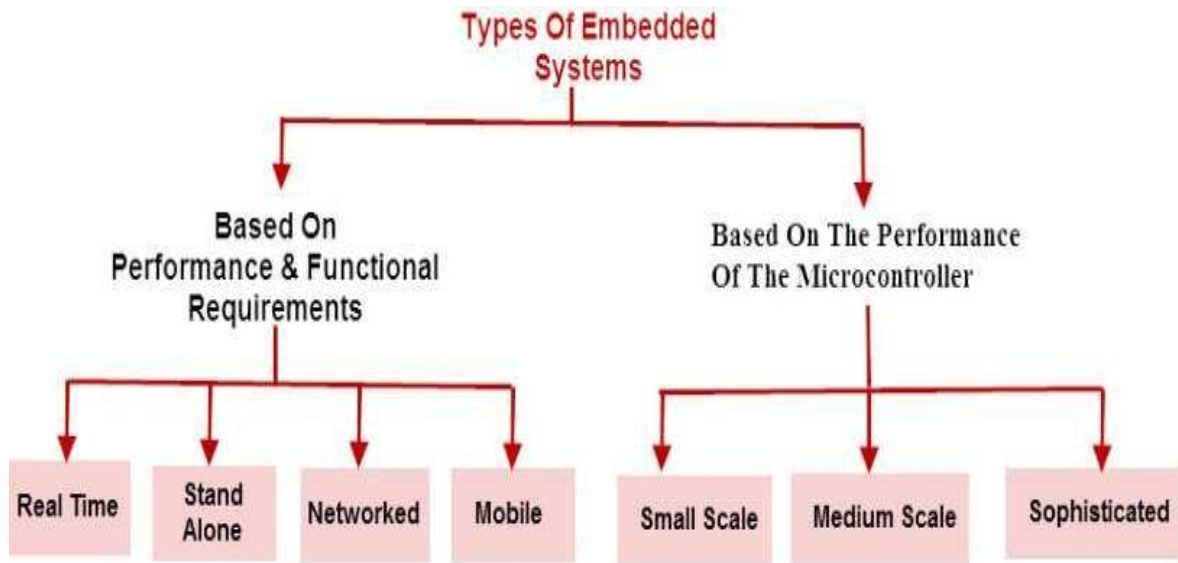


FIG 3.2 CLASSIFICATION OF EMBEDDED SYSTEM

Advanced HVAC systems use networked thermostats to additionally and expeditiously control temperature that may be amended by time of day and season. Home automation uses wired- and wireless-networking that may be used to manage lights, climate, security, audio/visual, police work, etc., all of which use embedded devices for sensing and controlling.

Like traffic lights, works controllers, and mostly complicated systems like hybrid vehicles, MRI, and avionics Embedded systems vary from moveable devices such as digital watches and MP3 players, to giant stationary installations. complexity varies from low, with a single microcontroller.

BLOCK DIAGRAM OF AN EMBEDDED SYSTEM:

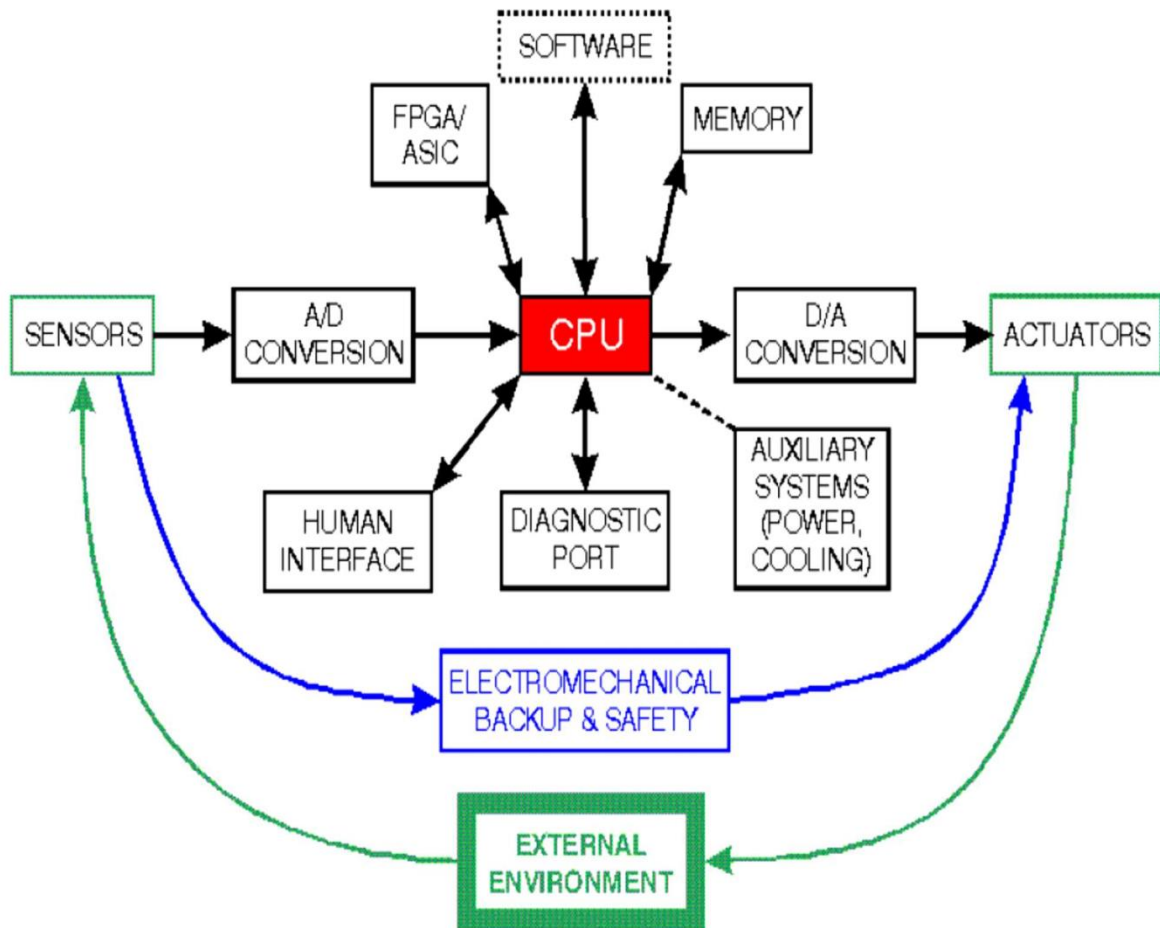


FIG 3.3 BLOCK DIAGRAM OF AN EMBEDDED SYSTEM

An embedded system sometimes contains an embedded processor. Many appliances that have a digital interface microwaves, VCRs, cars utilize embedded systems. Some embedded systems embrace an software package. Others are unit terribly specialized leading to the whole logic being enforced as one program. These systems are unit embedded into some device for a few specific Purpose apart from to provide general purpose computing.

APPLICATIONS:

- Embedded systems in cars embrace control, control, body safety,
- engine safety, artificial intelligence in associate production line, automotive transmission, automotive amusement,
- E-com access, mobiles etc.
- Embedded systems in telecommunications embrace networking, mobile computing,
- and wireless communications, etc.
- Embedded systems in sensible cards include banking, phone and security systems.
- Embedded Systems in satellites and missiles embrace defense, communication, and aerospace.
- Embedded systems in laptop networking & peripherals embrace image process,
- networking systems, printers, network cards, monitors and displays.
- Embedded Systems in digital client physics embrace set-top boxes, DVDs, high-definition TVs, and digital cameras.

CHAPTER 4

HARDWARE DESCRIPTION

HARDWARE KIT

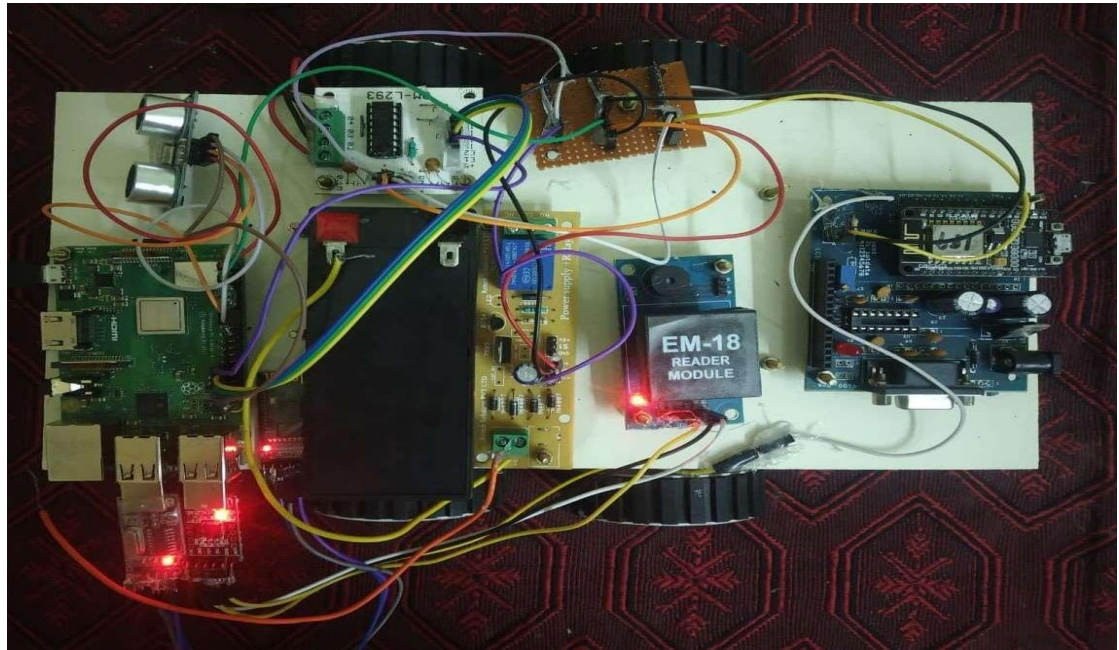
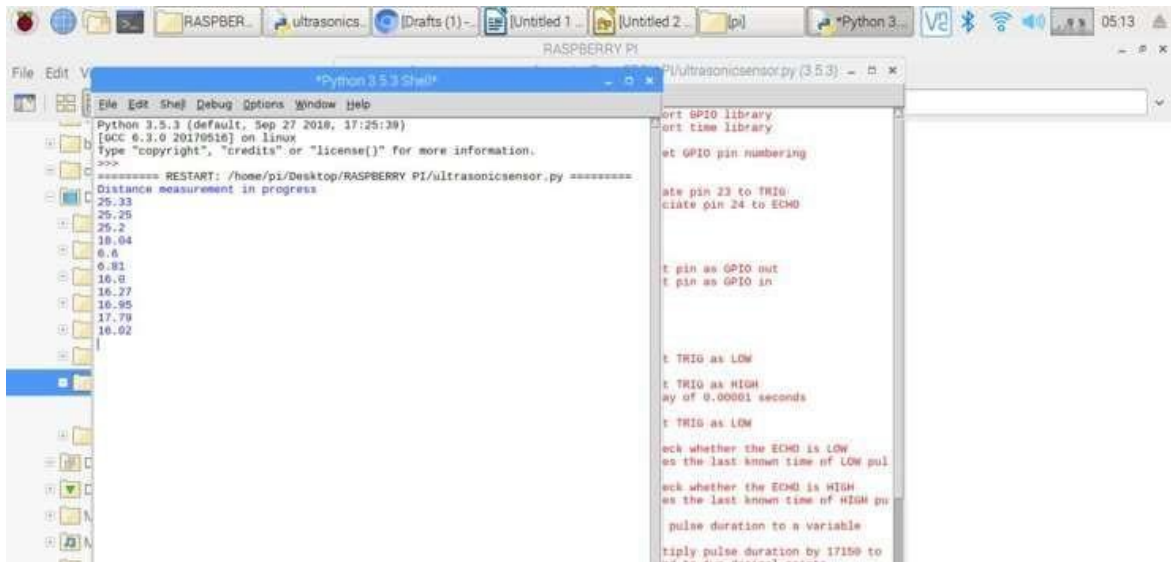


FIG 4.1 PHOTOCOPY OF HARDWARE CIRCUIT

This project work was ingrained with the on top of fig.4.1 shown hardware modules. The outputs obtained because the results of the higher than setup ar given as follows. The higher than diagram fig.4.1 shows the hardware kit illustration of IoT primarily based good pushcart victimization RFID for the Blind People's. during this fig 4.1, it explains regarding the hardware elements layout and affiliation diagram.

VARIOUS STAGES OF OUTPUT:



```
Python 3.5.3 (default, Sep 27 2018, 17:25:39)
[GCC 6.3.0 20170516] on linux
Type "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: /home/pi/Desktop/RASPBERRY PI/ultrasonicsensor.py =====
Distance measurement in progress
25.33
25.25
25.2
18.04
0.6
0.31
16.8
16.27
16.95
17.79
18.02

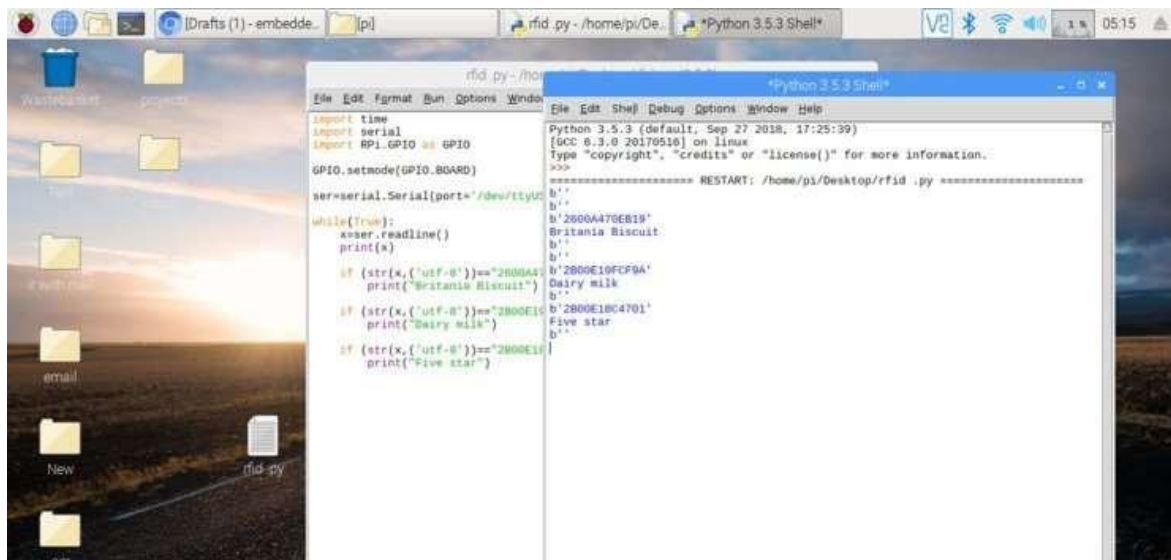
import GPIO library
import time library
set GPIO pin numbering
set pin 23 to TRIG
set pin 24 to ECHO

set pin as GPIO out
set pin as GPIO in

set TRIG as LOW
set TRIG as HIGH
delay of 0.0001 seconds
set TRIG as LOW

check whether the ECHO is LOW
as the last known time of LOW pulse
check whether the ECHO is HIGH
as the last known time of HIGH pulse
pulse duration to a variable
multiply pulse duration by 17150 to
```

FIG 4.2 OUTPUT OF ULTRASONIC SENSOR



```
import time
import serial
import RPi.GPIO as GPIO

GPIO.setmode(GPIO.BOARD)

ser=serial.Serial(port="/dev/ttyUSB0")

while(True):
    a=ser.readline()
    print(a)

    if (str(x,'utf-8'))=="2800A5":
        print("Britania Biscuit")

    if (str(x,'utf-8'))=="2800E1C":
        print("Dairy milk")

    if (str(x,'utf-8'))=="2800E1B":
        print("Five star")

b''
b'2600A470EB19'
Britania Biscuit
b''
b'2800E10FCF9A'
Dairy milk
b''
b'2800E1BC4701'
Five star
b''
```

FIG 4.3 OUTPUT OF RFID READER

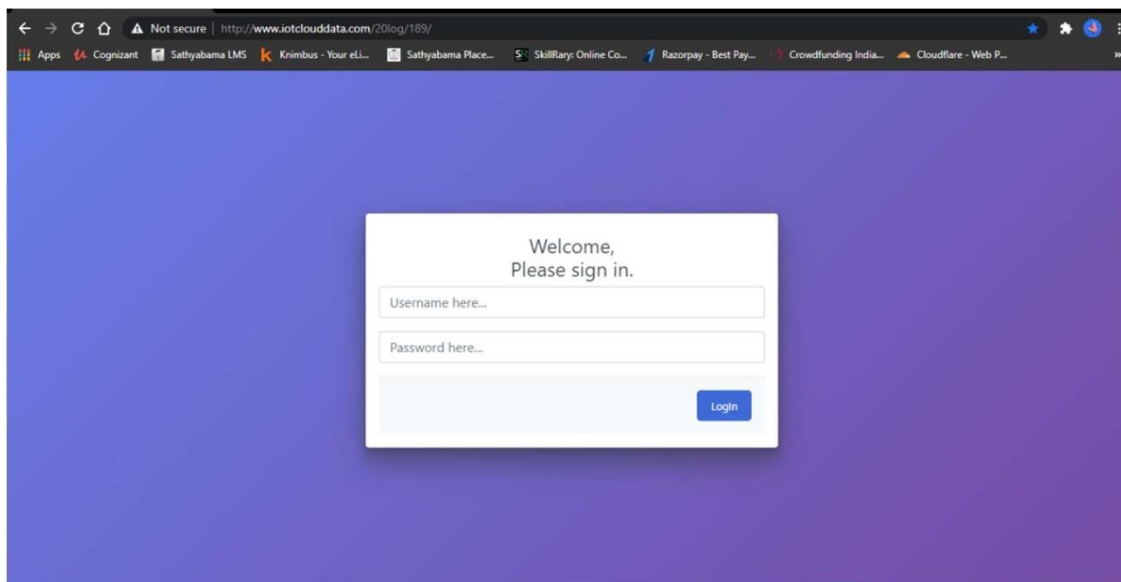


FIG 4.4 LOGIN SCREEN OF DATA STORED IN WEBSITE

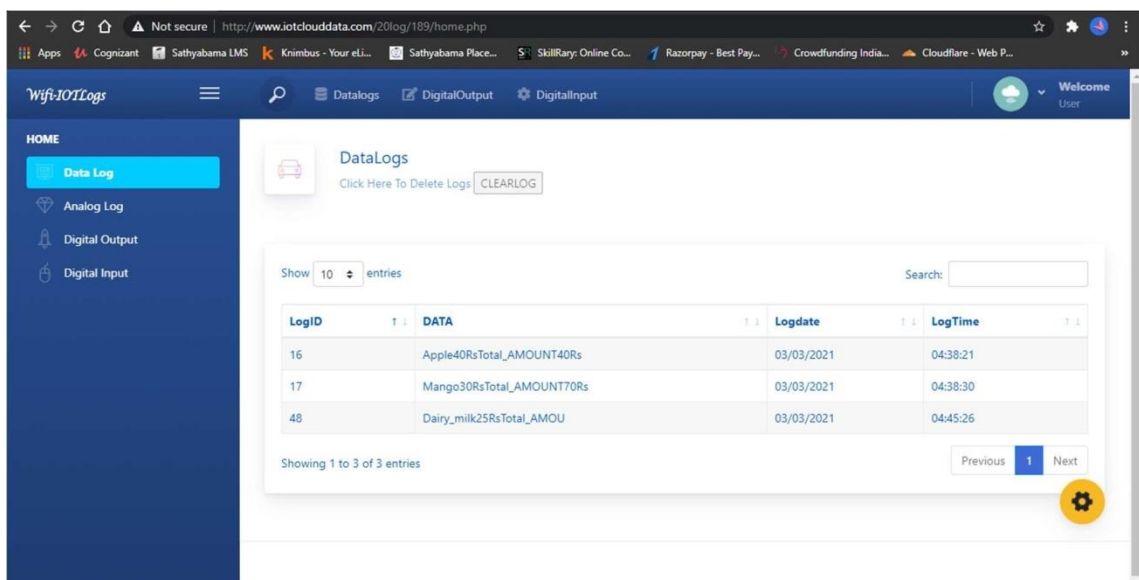


FIG 4.5 PRODUCT DETAILS STORED IN WEBSITE – 1st SCREEN

Wifi-IOTLogs

HOME

- Data Log
- Analog Log
- Digital Output
- Digital Input

DataLogs

Click Here To Delete Logs [CLEARLOG](#)

Show 10 entries

Search:

LogID	DATA	Logdate	LogTime
16	Apple40RsTotal_AMOUNT40Rs	03/03/2021	04:38:21
17	Mango30RsTotal_AMOUNT70Rs	03/03/2021	04:38:30
48	Dairy_milk25RsTotal_AMOU	03/03/2021	04:45:26
363	Apple30RsTotal_AMOUNT30Rs	03/03/2021	20:31:52
364	Mango0RsTotal_AMOUNT0Rs	03/03/2021	20:32:00
366	Apple40RsTotal_AMOUNT40Rs	03/03/2021	20:32:14
367	Mango70RsTotal_AMOUNT70Rs	03/03/2021	20:32:23

FIG 4.6 PRODUCT DETAILS STORED IN WEBSITE – 2nd SCREEN

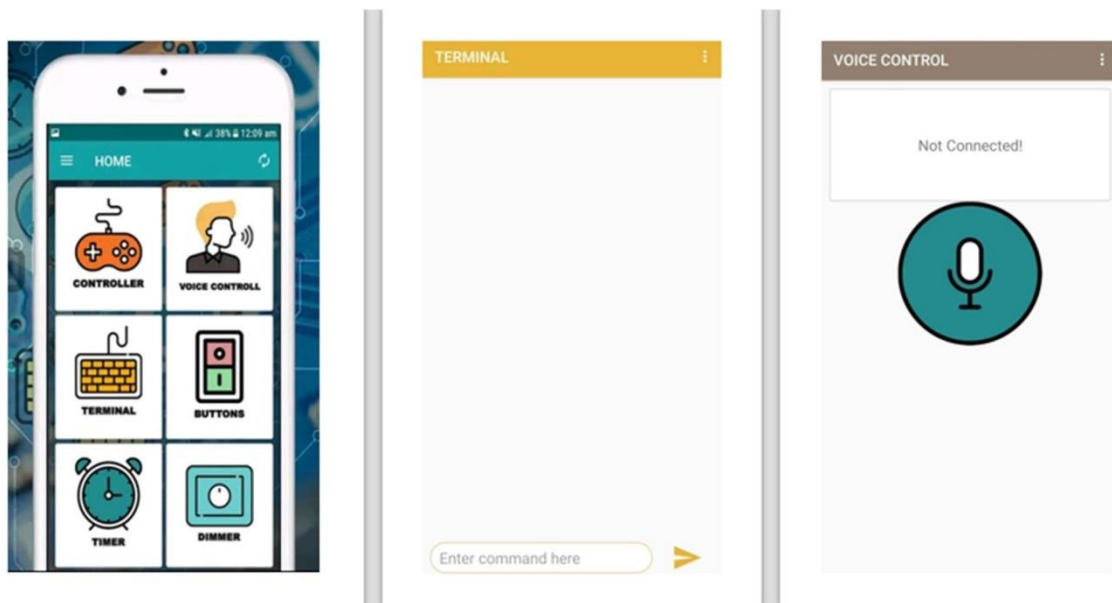


FIG 4.7 APPLICATION SCREEN USED FOR GIVING INPUTS

RASPBERRY PI:

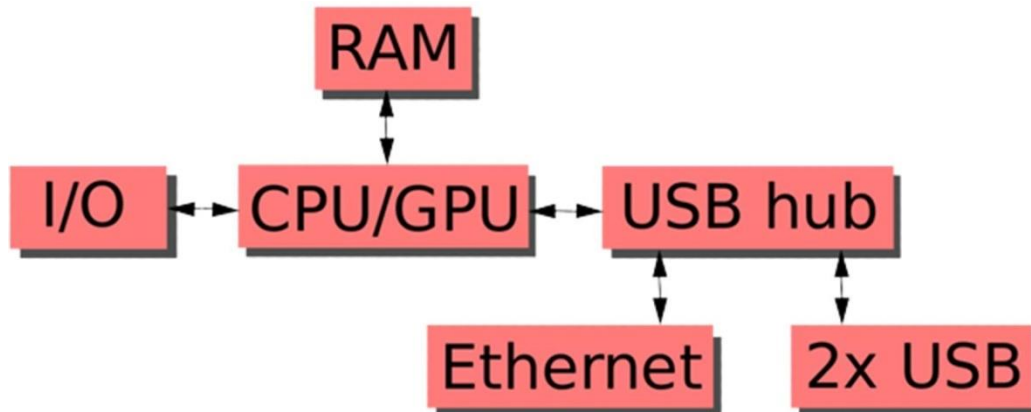


FIG 4.8 BLOCK DIAGRAM OF MODEL B AND B+

The Raspberry Pi hardware has evolved through many versions that feature variations in memory capability and peripheral-device support. This diagram describes Model B and B+; Model A, A+, and also the Pi Zero are similar, however lack the local area network and USB hub parts. The local area network adapter is internally connected to an extra USB port. In Model A, A+, and also the Pi Zero, the USB port is connected on to the system on a chip (SoC). On the Pi one Model B+ and later models the USB/Ethernet chip contains a five-port USB hub, of that four ports are obtainable, whereas the Pi 1 Model B solely provides 2. On the Pi Zero, the USB port is additionally connected on to the SoC, however it uses a small USB (OTG) port.

Processor:

- The Broadcom BCM2835 SoC used within the primary generation Raspberry Pi includes a 700 MHz ARM11 76JZF-S processor, Video core IV graphics process unit (GPU), and RAM. It's grade one (L1) cache of sixteen KB and grade a combine of (L2) cache of 128 KB.
- The earlier V1.1 model of the Raspberry Pi 2 used a Broadcom BCM2836 SoC with a 900 megahertz 32-bit, quad-core ARM Cortex-A7 processor, with 256 KB shared L2 cache. The Raspberry Pi 2 V1.2 was upgraded to a Broadcom BCM2837 SoC with a 1.2 Gc 64-bit quad-core ARM Cortex-A53 processor,

identical SoC that is used on the Raspberry Pi three, however underclocked (by default) to identical 900 megahertz per second processor clock speed as a results of the V1.1. The BCM2836 SoC is no a lot of in production recently 2016.

- The Raspberry Pi above 3 - Broadcom BCM2837B0 SoC with a 1.4 GHz, 64-bit 4-core ARM Cortex-A53 processor, 512 Kb - L2 cache.

Performance:

- While operational at 700 megacycle per second by default, the first generation Raspberry Pi provided a real-world performance roughly such as zero.041 GFLOPS. On the central process unit level the performance is analogous to a three hundred megacycle per second Pentium II of 1997-99. The GPU provides one Giga Pixel/s or one.5 Giga Texel/s of graphics method or twenty four GFLOPS of general computing performance. The graphical capabilities of the Raspberry Pi unit of measurement roughly such as the performance of the Xbox of 2001.
- Raspberry Pi a pair of V1.1 enclosed a quad-core Cortex-A7 electronic equipment running at 900 megahertz and one GB RAM. it absolutely was delineate as 4-6 times additional powerful than its precursor. The GPU was clone of the initial. In parallelized benchmarks, the Raspberry Pi a pair of V1.1 can be up to 14 times quicker than a Raspberry Pi one Model B+.
- The Raspberry Pi 3, with a quad-core ARM Cortex-A53 processor, is delineate as having 10 times the performance of a Raspberry Pi one. This was steered to be extremely dependent upon task threading and instruction set use. Benchmarks showed the Raspberry Pi three to be roughly eightieth quicker than the Raspberry Pi a pair of in parallelized tasks.

Overclocking

- Most Raspberry Pi systems-on-chip will be overclocked to 800 megacycle per second per second, and many to one thousand MHz's There ar reports the Raspberry Pi a try of is also equally overclocked, in extreme cases, even to 1500 megacycle per second per second (discarding all safety choices and over-voltage limitations). at intervals the Raspbian UNIX software distro the overclocking decisions on boot is also done by a software command running "sudo raspi-config" whereas not excretion the reassurance. In those cases the Pi automatically shuts

the overclocking down if the chip temperature reaches eighty five °C (185 °F), but it's achievable to override automatic over-voltage associated degreed overclocking settings (voiding the warranty); associated befittingly sized sink is needed to defend the chip from serious warming.

- Newer versions of the microcode contain the choice to settle on between 5 overclock ("turbo") presets that once used, arrange to maximize the performance of the SoC while not impairing the period of time of the board. this can be done by observance the core temperature of the chip and therefore the mainframe load, and dynamically adjusting clock speeds and therefore the core voltage. once the demand is low on the mainframe or it's running too hot the performance is throttled, however if the mainframe has a lot of to try and do and therefore the chip's temperature is suitable, performance is quickly accumulated with clock speeds of up to one rate, betting on the individual board and on that of the turbo settings is employed.

L293D MOTOR DRIVER:

L293D will be a 2 H-bridge motor driver IC. Motor drivers - current amplifiers, take a low current management signal & provide a higher current signal. This higher current signal is utilized to drive the motors.

L293D contains 2 constitutional H-bridge driver circuits. In its common mode of operation, 2 DC motors may be driven at the same time, each in forward and reverse direction. The motor operations of 2 motors may be controlled by input logic at pins two & seven and ten & fifteen. logic 00 or eleven as input will stop the particular motor. Logic 01 and 10 can rotate it in right-handed and anticlockwise directions, severally.

change pins one and nine (corresponding to the 2 motors) should be high for motors to start out operative. once an change input is high, the associated driver gets enabled. As a final result, the outputs becomes active & add section with their inputs. Similarly, once the change input is low, that driver is disabled, and their outputs are off and within the high-impedance state.

PIN DIAGRAM:

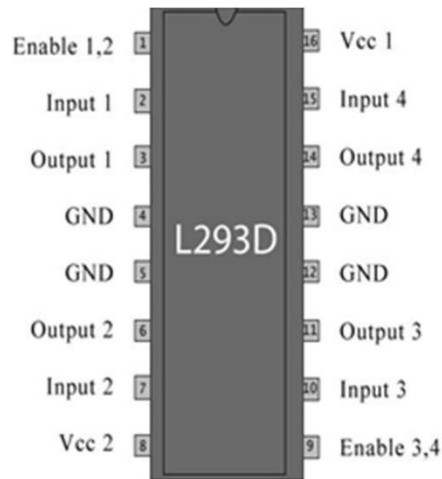


FIG 4.9 PIN DIAGRAM OF L293D DRIVER

Common DC gear head motors want current higher than 250mA. Integrated circuits like ATmega16, 555 timer IC. However IC seventy four series cannot provide this quantity of current. once the motor is directly connected to the o/p of the on top of ICs then, they could harm. To overcome this issue, a control circuit for motor is required, which act as a bridge between the motors and IC's (integrated circuits). Using transistor, relays and L293D/L298, we can make h-bridge control circuit for motor.

H-Bridge Circuit

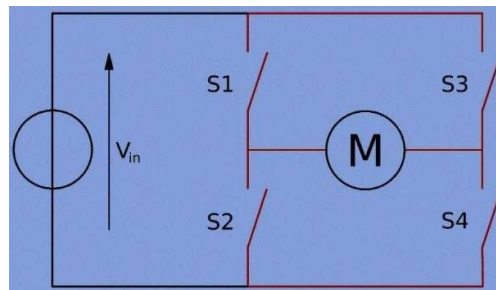


FIG 4.10 H-BRIDGE CIRCUIT

A H-bridge is fictitious with four switches like S1, S2, S3 and S4. once the S1 and S4 switches are closed, then a '+ve voltage are going to be applied across the motor. By gap

the switches S1 and S4 and shutting the switches S2 and S3, this voltage is inverted, permitting invert operation of the motor. Generally, the H-bridge motor driver circuit is employed to reverse the direction of the motor and to interrupt the motor. once the motor involves a unforeseen stop, because the terminals of the motor area unit shorted. Or let the motor run absolve to a stop, once the motor is detached from the circuit. The table below offers the various operations with the four switches adore the higher than circuit.



FIG 4.11 L293 MOTOR DRIVER

L293D Motor Driver IC

L293D IC may be a typical Motor Driver IC that permits the DC motor to drive on any direction. This IC consists of 16-pins that area unit accustomed management a group of 2 DC motors in a flash in any direction. It means, by employing a L293D IC we will management 2 DC motors. As well, this IC will drive little and quiet massive motors.

This L293D IC works on the essential principle of H-bridge, this control circuit permits the voltage to be flowing in any direction. As we all know that the voltage should be modification the direction of having the ability to rotate the DC motor in each the directions. Hence, H-bridge circuit exploitation L293D ICs area unit good for driving a motor. Single L293D IC consists of 2 H-bridge circuits within which may rotate 2 DC

motors individually. Generally, these circuits are unit employed in artificial intelligence thanks to its size for dominant DC motors..

MOTOR:

Motor could be a device that manufacture mechanical output. The operating of motor is given as follows: One is to use a sort of electrical current that sporadically reverses direction, that is thought as AN electrical energy (AC). within the reasonably tiny, powered motors we have a tendency to use round the home, an improved resolution is to feature a element referred to as an electrical switch to the ends of the coil. In its simplest type, the electrical switch could be a metal ring divided into 2 separate halves and its job is to reverse the electrical current within the coil anytime the coil rotates through half a flip. One finish of the coil is hooked up to every 1/2 the electrical switch. Battery which supplies electric current connects to the motor's terminals. These feed wattage through a combine of loose connectors referred as brushes, created either from the items of carbon (soft carbon - pencil "lead") or skinny lengths of resilient metal, that (as the name suggests) "brush" against the electrical switch. With the electrical switch in situ, once electricity flows through the circuit, the coil can rotate frequently within the same direction.

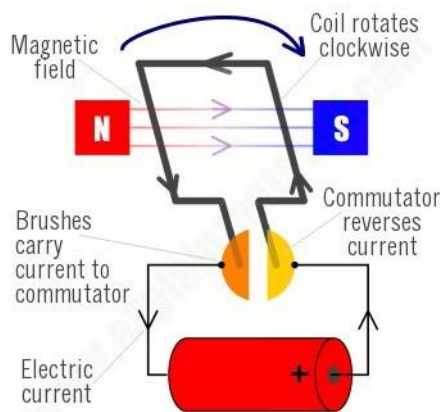


FIG 4.12 DIAGRAMATIC REPRESENTATION OF MOTOR

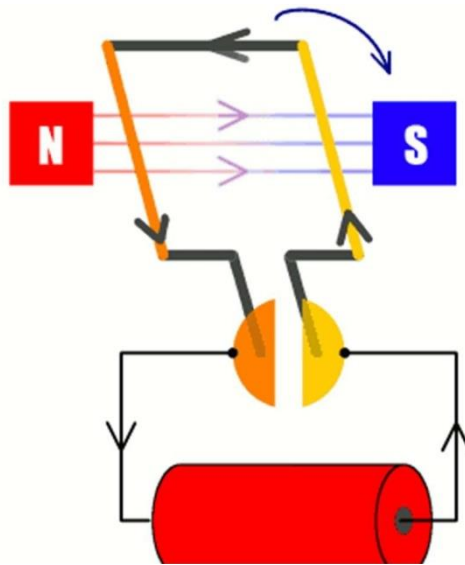


FIG 4.13 WORKING REPRESENTATION OF MOTOR

COMPONENTS



FIG 4.14 COMPONENTS OF MOTOR

ROTOR

In AN electrical motor, the moving 0.5 is that the rotor, that turns the shaft to deliver the mechanical power. The rotor generally has conductors ordered into it that carry currents, that act with the sphere of force of the machine to come back up with the forces that flip

the shaft. or else, some rotors carry permanent magnets, and so the stator holds the conductors.

BEARINGS

Bearings Supported the rotor, allows the rotor to indicate on its axis. The bearings unit of measurement in turn supported by the motor housing. The motor shaft extends through the bearings to the surface of the motor, where the load is applied. as a results of the forces of the load square measure exerted on the so much facet the outermost bearing, the load is claimed to be bearings.

STATOR

The mechanical device is that the stationary a region of the motor's magnetism circuit and often consists of either windings or permanent magnets. The mechanical device core is made of many skinny metal sheets, remarked as laminations. Laminations unit accustomed cut back energy losses that may result if a solid core were used.

Air gap

The distance between the rotor and mechanical device is named the air gap. The air gap has necessary effects, and is usually as small as potential, as an oversized gap encompasses a robust negative impact on performance. it's the most supply of the low power issue at that motors operate. The magnetizing current will increase with the air gap. For this reason, the air gap ought to be negligible. ridiculously little gaps could create mechanical issues additionally to noise and losses.

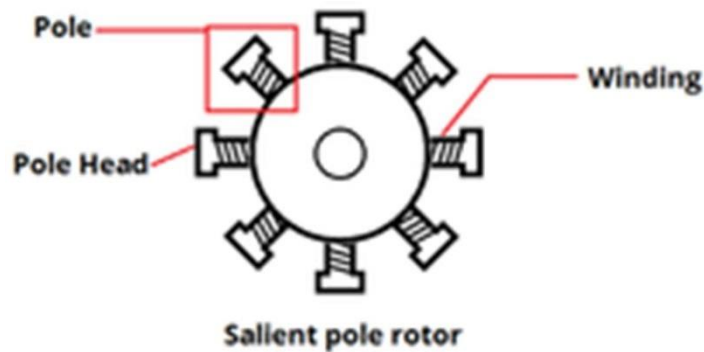


FIG 4.15 SALIENT POLE ROTOR

WINDINGS

Windings are wires that are unit ordered in coils, typically wrapped around a laminated thereforeft iron magnetic core so on kind magnetic poles once energized with current.

Electric machines are available 2 basic magnet field pole configurations: salient- and non-salient-pole configurations. within the salient-pole machine the pole's flux is made by a winding wound round the pole below the pole face. within the non-salient-pole, or distributed field, or round-rotor, machine, the winding is distributed in pole face slots. A shaded-pole motor contains a winding around a part of the pole that delays the section of the flux for that pole.

Some motors have conductors that accommodates thicker metal, like bars or sheets of metal, typically copper, instead aluminium. These area unit typically steam-powered by magnetic attraction induction

COMMUTATOR

A electrical switch may be a mechanism accustomed switch the input of most DC machines and bound AC machines. It consists of slip-ring segments insulated from one another and from the shaft. The motor's coil current is provided through stationary brushes connected with the revolving electrical switch, that causes needed current reversal, Associate in Nursingd applies power to the machine in an optimum manner because the rotor rotates from pole to pole. In absence of reversal current, the motor will stop. In lightweight of improved technologies within the electronic-controller, detector less-control, induction-motor, and permanent-magnet-motor fields, externally-commutated induction and permanent-magnet motors area unit displacing electromechanically-commutated motors.



FIG 4.16 A SMALL TOY'S COMMUTATOR

A DC motor is typically provided through connector commutator as delineate on top of. AC motor's commutation will be either connector electrical switch or outwardly commutated kind, will be fixed-speed or variable-speed type kind, and might be synchronous or asynchronous kind. We will use AC or DC to run universal motors.

Motor control

AC motors which is controlled by fixed speed provided with direct online otherwise soft start starters.

Variable-speed controlled AC motors are supplied with a variety of various power electrical converter, variable-frequency drive or electronic electric switch technologies.

The term electronic electric switch is sometimes related to self-commutated brushless DC motor and switched reluctance motor applications.

BLUETOOTH MODULE

Fixed-speed controlled AC motors are supplied with direct-on-line or soft-start starters.

Variable-speed controlled AC motors are supplied with a variety of various power electrical converter, variable-frequency drive or electronic electric switch technologies.

The term electronic electric switch is sometimes related to self-commutated brushless DC motor and switched reluctance motor applications.

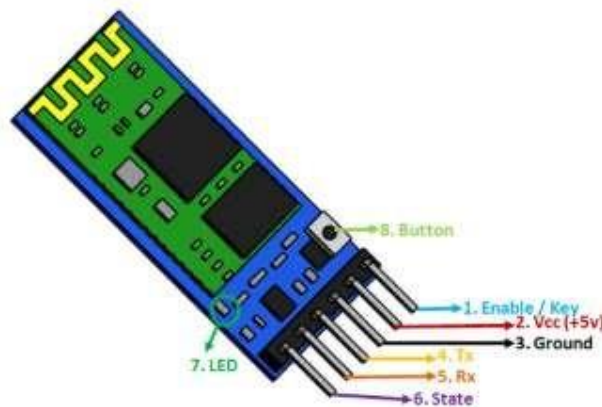


FIG 4.17 BLUETOOTH MODULE

Hardware Features

- Typical -80dBm sensitivity
- Up to +4dBm RF transmit power
- Low Power one.8V Operation ,1.8 to 3.6V I/O

- PIO management
- UART interface with programmable information measure
- With integrated antenna
- With edge instrumentation

Software Features

- Information measure rate: 38400, knowledge bits:8, Stop bit:1, Parity type: No parity, knowledge control: Supported information measure rate: 9600,19200 etc.,
- Given a rising pulse in PIO0, device are disconnected.
- Status instruction port PIO1: low-disconnected, high-connected.
- PIO10 and PIO11 is connected to Red, and blue light-emitting diode individually.

PIN CONFIGURATION

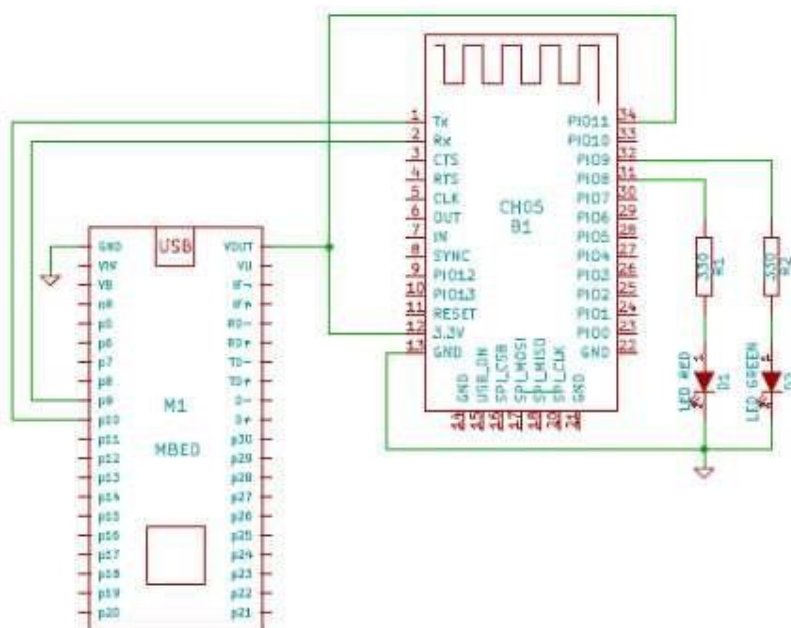


FIG 4.18 PIN CONFIGURATION

When slave and master are paired, red and blue semiconductor diode blinks 1time er 2 seconds in interval, whereas disconnected separately blue semiconductor diode blinks 2times per seconds.

- Auto-connect to device which is present at last as default.

- It Permits pairing device to attach.
- As default, Auto-pairing PINCODE is :”0000”
- Auto-reconnect in thirty minutes - once disconnected as a result of on the far side the vary of association.

The HC-05 has 2 operative modes, one is that the information mode within which it will send and receive information from alternative Bluetooth devices and also the alternative is that the AT Command mode wherever the default device settings will be modified. we are able to operate the device in either of those 2 modes by mistreatment the key pin as explained within the pin description.

It is terribly simple to combine the HC-05 module with microcontrollers as a result of it operates mistreatment the interface Protocol (SPP). merely power the module with +5V and connect the Rx pin of the module to the American state of MCU and American state pin of module to Rx of MCU

During power up the key pin will be grounded to run into Command mode, if left free it will automatically enter into the info mode. As presently because the module is power-driven you must be ready to discover the Bluetooth device as “HC-05” then connect with it mistreatment the default secret 1234 and begin communication with it.

APPLICATIONS

1. Wireless communication between 2 microcontrollers.
2. Communicate with portable computer, Desktops, and mobile phones.
3. information work application.
4. shopper applications.
5. Used in Wireless Robots.
6. Used in home Automation.

RFID – RADIO FREQUENCY IDENTIFICATION

RFID is an form for “radio-frequency identification” and refers to a technology whereby digital information encoded in RFID tags or sensible labels (defined below) square

measure captured by a reader via radio waves. RFID is analogous to barcoding therein information from a tag or label square measure captured by a tool that stores the information in a very information. RFID, however, has many blessings over systems that use barcode plus pursuit package. the foremost notable is that RFID tag information are often scan outside the line-of-sight, whereas barcodes should be aligned with AN optical scanner.

WORKING

RFID belongs to a gaggle of technologies noted as Automatic Identification and information Capture (AIDC). RFID ways utilize radio waves to accomplish this.

At a straightforward level, RFID systems contains 3 components: an RFID tag or sensible label, an RFID reader, and an antenna.

RFID tags contain a microcircuit and an antenna, that are accustomed transmit information to the RFID reader (also known as associate degree interrogator). The reader then converts the radio waves to a lot of usable style of information. info collected from the tags is then transferred through a communications interface to a bunch computing system, wherever the information is hold on during an information and analyzed later.

Defining RFID

RFID or frequency Identification System may be a Technology based mostly identification system that helps distinguishing objects simply through the tags hooked up to them, while not requiring any lightweight of sight between the tags and therefore the tag reader. All that's required is radio communication between the tag and therefore the reader.

A Basic RFID System

- Radio frequency identification consists of a Si conductor connected to a touch associate degreasing and mounted on a substrate and encapsulated in varied materials like plastic or glass veil and with an adhesive on the rear side to be connected to things.

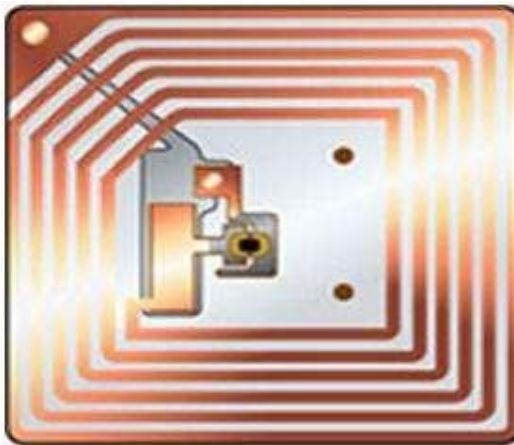


FIG 4.19 RFID Tag

- Radio frequency identification consists of a scanner with antennas to transmit and receive signals and is chargeable for communication with the tag and receives the data from the tag.



FIG 4.20 An RFID Reader

- Radio frequency identification are a number portable computer with a chip or a microcontroller that receives the reader input and knowledge.

TWO TYPES OF RFID SYSTEMS

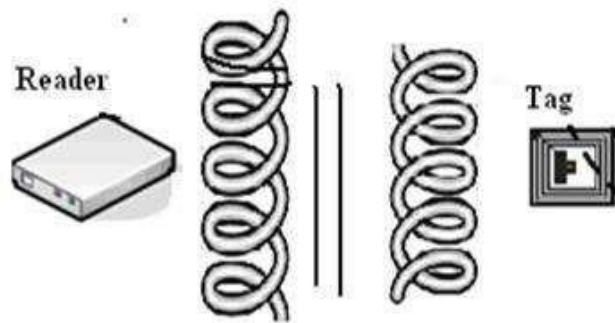
- **Active RFID system:** These are unit systems wherever the tag has its own power supply like all external power offer unit or electric battery. the sole constraint being the life time of the facility devices. These systems will be used for larger distances and to trace high price merchandise like vehicles.
- **Passive RFID system:** These are systems wherever the tag gets power through the transfer of power from a reader antenna to the tag antenna. they're used for brief vary transmission. Here we tend to square measure principally involved with the passive RFID system because it is most generally utilized in regular applications like in retail market organizations.

A brief idea about How the Passive RFID System Works:

The tag will be high-powered either victimisation inducting coupling methodology or through EM wave capture methodology.

Let us have a short information regarding the system victimisation these 2 strategies.

A Passive RFID system using Induction coupling method: In this approach the RFID tag gets power from the reader through inductive coupling methodology. The reader consists of a coil connected to an AC provide such a field is made around it. The tag coil is placed within the neighborhood of the reader coil associated an voltage is evoked it by the virtue of Faraday's law of induction. The electromotive force causes a flow of current within the coil, so manufacturing a field around it. By the virtue of Lenz law, the field of the tag coil opposes the reader's field and there'll be a ulterior increase within the current through the reader coil. The reader intercepts this because the load data. this technique is appropriate for terribly short distance communication. The AC voltage showing across the tag coil is born-again to DC exploitation rectifier and filter arrangement.



Reader Coil Inductively coupled to tag coil

FIG 4.21 Passive RFID using Inductive Coupling

A Passive RFID system using EM wave propagation method: The antenna gift within the reader transmits magnetic attraction waves that area unit received by the antenna gift within the tag as voltage across the dipole. This voltage is corrected and filtered to induce the DC power. The receiver antenna is unbroken at completely different ohmic resistance that causes it to replicate a neighborhood of the received signal. This mirrored signal is received by the reader and monitored consequently.

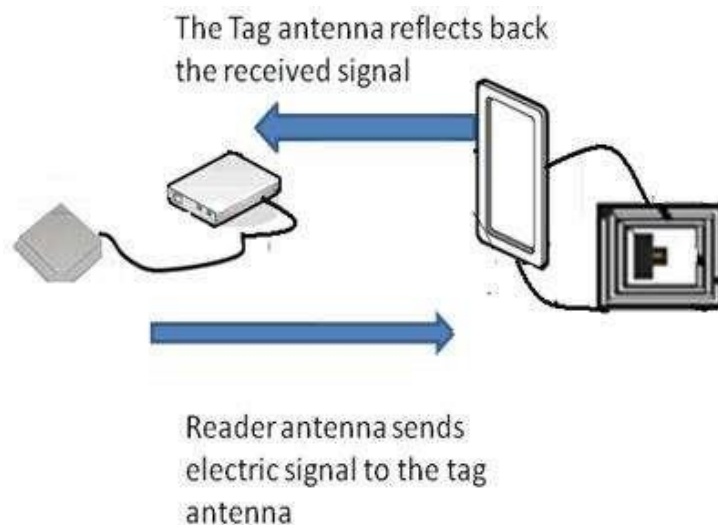


FIG 4.22 Passive RFID using EM-wave transmission

An Idea about How the Active RFID System Works:

In the active RFID system, the reader sends signal to the tag via an antenna. The tag receives this info and resends this info together with the knowledge in its memory.

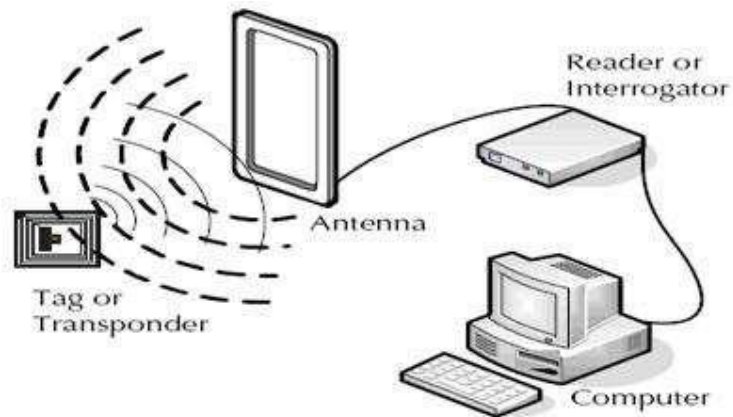


FIG 4.23 An Active RFID system

RFID TAGS AND SMART LABELS

As declared higher than, an RFID tag consists of Associate in Nursing microcircuit an antenna. The tag is additionally composed of a protecting material that holds the items along and shields them from numerous environmental conditions. The protecting material depends on the applying. for instance, worker ID badges containing RFID tags generally made of sturdy plastic, and also the tag is embedded between the layers of plastic. RFID tags are available in a range of shapes and sizes and are either passive or active. Passive tags the foremost wide used, as they're smaller and fewer pricey to implement. Passive tags should be "powered up" by the RFID reader before they'll transmit information.

Smart labels take issue from RFID tags therein they incorporate each RFID and barcode technologies. They're manufactured from Associate in Nursing adhesive label embedded with an RFID tag inlay, and that they can also feature a barcode and/or different written info. good labels may be encoded and written on-demand exploitation desktop label

printers, whereas programming RFID tags are longer intense and needs additional advanced instrumentality.

RFID APPLICATIONS

Although RFID technology has been in use since warfare II, the demand for RFID instrumentality is increasing chop-chop, partially due to mandates issued by the U.S. Department of Defense (DoD) and Wal-Mart requiring their suppliers to modify product to be traceable by RFID.

Whether or not RFID compliance is needed, applications that presently use barcode technology area unit sensible candidates for upgrading to a system that uses RFID or some combination of the 2. RFID offers several benefits over the barcode, notably the very fact that AN RFID tag will hold far more knowledge concerning AN item than a barcode will. additionally, RFID tags don't seem to be at risk of the damages which will be incurred by barcode labels, like rending and smearing.

INTERNET OF THINGS

- The term net of Things usually refers to eventualities wherever network property and computing capability extends to things, sensors and everyday things not commonly thought of computers, permitting these devices to get, exchange and consume information with token human intervention.
- Enabling Technologies: The thought of mixing computers, sensors, and networks to watch and management devices has existed for many years. The recent confluence of many technology market trends, however, is transfer the web of Things nearer to widespread reality. These embody omnipresent property, Widespread Adoption of IP-based Networking, Computing social science, miniaturization.
- Connectivity Models: IoT implementations use completely different technical communications models, every with its own characteristics.
- Four common communications models represented by the web design Board include:

1. Device-to-Device
 2. Device-to-Cloud
 3. Device-to-Gateway
 4. Back-End information - Sharing.
- These models highlight the pliability within the ways in which IoT devices will connect and supply price to the user.

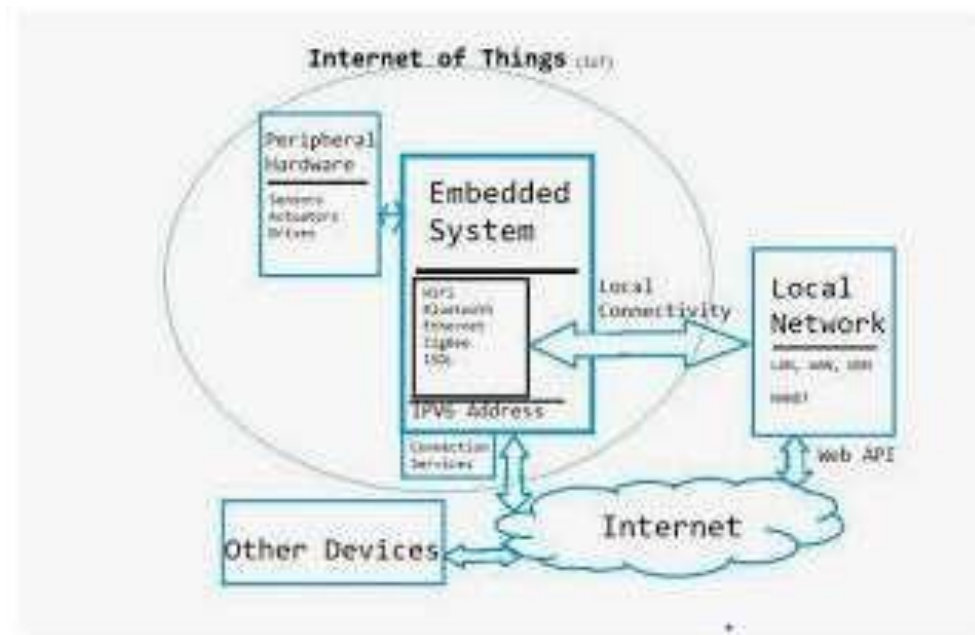


FIG 4.24 AN IOT SYSTEM

IoT devices are enforced victimization each hardware and software package elements. Dedicated hardware elements are wont to implement the interface with the physical world, and to perform tasks that are a lot of computationally complicated. Microcontrollers are wont to execute software package that interprets inputs and controls the system. The functions of common hardware elements are delineated and also the interface between the software package and hardware through the microcontroller is explained. IoT devices typically use associate operating system to support the interaction between the software package and also the microcontroller. we'll outline the role of associate operating system in associate IoT device and the way associate IoT operating system differs from a typical one.

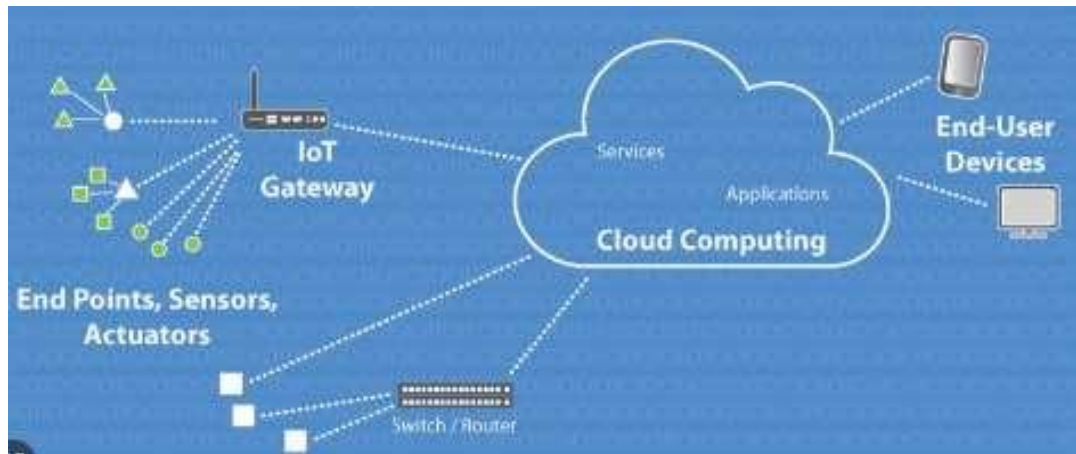


FIG 4.25 CLOUD COMPUTING

How IoT works?

IoT devices share the detector knowledge they collect by connecting to Associate in Nursing IoT entryway or alternative edge device wherever knowledge is either sent to the cloud to be analyzed or analyzed domestically. Sometimes, these devices communicate with alternative connected devices and act on the data they get from each other. The devices do most of the work while not human intervention, though individuals will act with the devices -- for example, to line them up, offer them directions or access the information. The property, networking and communication protocols used with these web-enabled devices for the most part depend upon the particular IoT applications deployed.

Benefits of IoT

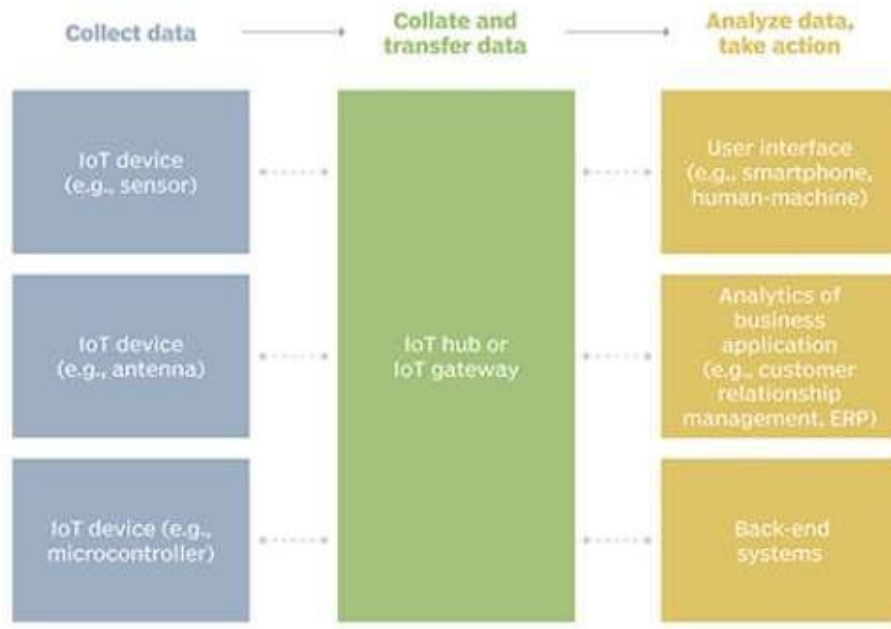


FIG 4.26 EXAMPLE OF IOT SYSTEM

The internet of things offers many edges to organizations, sanctionative them to:

- Monitor their overall business processes.
- Improve the client expertise.
- Save time and cash.
- Enhance worker productivity.
- Integrate and adapt business models.
- Make higher business selections and
- Generate a lot of revenue.

IoT encourages firms to rethink the ways in which they approach their businesses, industries and markets and offers them the tools to enhance their business ways.

PYTHON

Python is an understood, high-level, general artificial language. Developed by Guido van Rossum in 1991, Python features a style philosophy that emphasizes code readability, notably exploitation important whitespace. It provides constructs that modify clear programming on each little and huge scales. Van Rossum crystal rectifier the language community till stepping down as leader in Gregorian calendar month 2018.

It supports multiple programming paradigms, as well as object-oriented, imperative, useful and procedural, and features a massive and comprehensive customary library.

Python interpreters ar on the market for several in operation systems. CPython, the reference implementation of Python, is ASCII text file software package and features a community-based development model, as do nearly all of Python's different implementations. Python and CPython ar managed by the non-profit Python software package Foundation.

STATEMENTS AND CONTROL FLOW

- The if statement, that not absolutely executes a block of code, together with else and elif (a contraction of else-if).
- The for statement, that iterates over associate degree iterable object, capturing every component to a neighborhood variable to be used by the connected block.
- The whereas statement, that executes a block of code if its condition is true.
- The strive statement, that permits exceptions raised in its connected code block to be caught and handled by except clauses; it conjointly ensures that clean-up code in an exceedingly finally block can invariably be run despite however the block exits.
- The raise statement want to raise a fixed exception or re-raise a caught exception.

- The category statement, that executes a block of code and attaches its native namespace to a category, to be used in object-oriented programming.
- The def statement, that defines a perform or methodology.

EXPRESSIONS

- Some Python expressions square measure like languages like C and Java, whereas some are not:
- Addition, subtraction, and multiplication square measure constant, however the behavior of division differs. There are 2 forms of divisions in Python. they're floor division and number division. Python conjointly side the `**` operator for mathematical process.
- From Python three.5, the new `@` infix operator was introduced. it's meant to be employed by libraries like NumPy for matrix operation.
- In Python, `==` compares by price, versus Java, that compares numeric by price and objects by reference. (Value comparisons in Java on objects may be performed with the equals () methodology.) Python's `is` operator is also wont to compare object identities (comparison by reference). In Python, comparisons is also bound, for instance `a <= b <= c`.
- Python uses the words and, or, not for its Boolean operators instead of the symbolic `&&`, `||`, employed in Java and C.
- Python includes a sort of expression termed a listing comprehension. Python 2.4 extended list comprehensions into a additional general expression termed a generator expression.
- Anonymous functions are enforced exploitation lambda expressions; but, these are restricted in this the body will solely be one expression.
- Conditional expressions in Python are written as `x if c else y` (different so as of operands from the `c? x: y` operator common to several different languages).

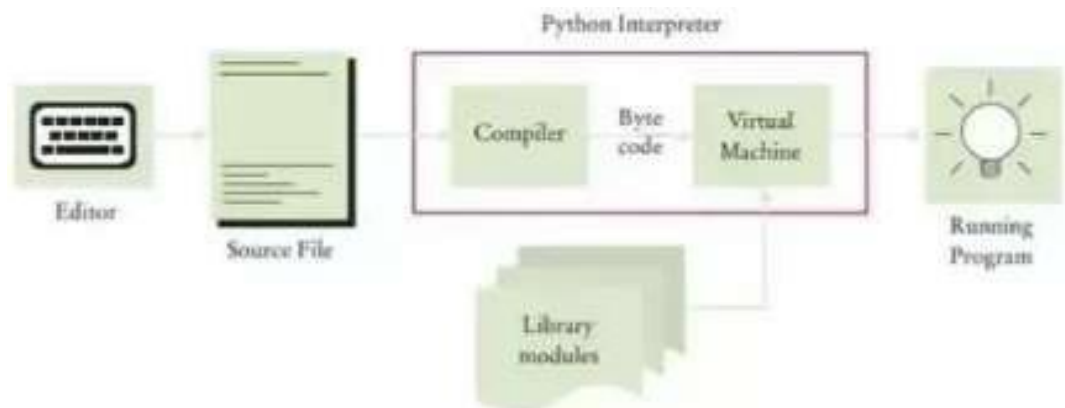


FIG 4.27 WORKING FLOW OF PYTHON CODE

An IDE (or Integrated Development Environment) could be a program dedicated to computer code development. because the name implies, day integrate many tools specifically designed for computer code development. These tools sometimes include:

- An editor designed to handle code (with, as an example, syntax highlight and auto-completion)
- Build, execution, and debugging tools
- Some variety of supply management

Most day support many various programming languages and contain more options. They can, therefore, be giant and take time to transfer and install. you will additionally would like advanced data to use them properly.

In distinction, a fervent code editor is as straightforward as a text editor with syntax highlight and code info capabilities. Most sensible code editors will execute code and management a computer program. the simplest ones act with supply management systems furthermore. Compared to associate IDE, a good, dedicated code editor is typically smaller and faster, however typically less feature wealthy.

Requirements for a Good Python Coding Environment

So, what things will we actually need in an exceedingly writing environment? Feature lists vary from app to app, however there square measure a core set of options that produces writing easier:

- **Save and reload code files**, If an IDE or editor won't allow you to save your work and open up everything later, within the same state it had been in after you left, it's not a lot of of an IDE.
- **Run code from at intervals the surroundings**. Similarly, if you want to drop out . of the editor to run your Python code, then it's not far more than a straightforward text editor.
- **Debugging Support** can able to step through your code because it runs could be a core feature of all day and most sensible code editors.
- **Syntax light** can able to quickly spot keywords, variables, and symbols in your code makes reading and understanding code a lot of easier.
- **Automatic code data format**, It will understand the particular line must be indented.

PROGRAM

```
import time

import serial

import RPi.GPIO as GPIO

from subprocess import call

import os,time

GPIO.setwarnings(False)

GPIO.setmode(GPIO.BOARD)

motorA =31

motorB =33

motorC =35

motorD =37

TRIG1= 16

ECHO1= 18

GPIO.setup(TRIG1, GPIO.OUT)

GPIO.setup(ECHO1, GPIO.IN)

GPIO.setup(motorA, GPIO.OUT)

GPIO.setup(motorB, GPIO.OUT)

GPIO.setup(motorC, GPIO.OUT)

GPIO.setup(motorD, GPIO.OUT)

ser=serial.Serial(port='/dev/ttyUSB1',baudrate=9600,parity=serial.PARITY_NONE,timeo
ut=1)

ser1=serial.Serial(port='/dev/ttyUSB0',baudrate=9600,parity=serial.PARITY_NONE,time
out=1)

amount=0

a=0

b=0
```

```
c=0
```

```
while(True):
```

```
    x=ser.readline()
```

```
    print(x)
```

```
    GPIO.output(motorA,0)
```

```
    GPIO.output(motorB,0)
```

```
    GPIO.output(motorC,0)
```

```
    GPIO.output(motorD,0)
```

```
    if (str(x,('utf-8'))=="fruits" or str(x,('utf-8'))=="m"):
```

```
##        for i in range(0,1):
```

```
            print("working")
```

```
            ser.write(b'w')
```

```
            os.system("espeak ' ' + "TROLLEY MOVE TO FRUITS SECTION" + " ' ' ")
```

```
            time.sleep(1)
```

```
            os.system("espeak ' ' + "TROLLEY MOVE FORWARD" + " ' ' ")
```

```
            time.sleep(1)
```

```
            GPIO.output(TRIG1, False)          #Set TRIG as LOW
```

```
            print ("Waitng For Sensor To Settle")
```

```
            GPIO.output(TRIG1, True)           #Set TRIG as HIGH
```

```
            time.sleep(0.00001)                #Delay of 0.00001 seconds
```

```
            GPIO.output(TRIG1, False)          #Set TRIG as LOW
```

```
            while GPIO.input(ECHO1)==0:        #Check whether the ECHO is LOW
```

```
                pulse_start1 = time.time()    #Saves the last known time of LOW pulse
```

```

while GPIO.input(ECHO1)==1:      #Check whether the ECHO is HIGH
    pulse_end1 = time.time()     #Saves the last known time of HIGH pulse
    print("working1")
    pulse_duration= pulse_end1 - pulse_start1 #Get pulse duration to a variable
    distance1= pulse_duration* 17150      #Multiply pulse duration by 17150 to
get distance
    distance1= round(distance1, 2)        #Round to two decimal points
    print("Distance:",distance1 - 0.5,"cm")
    time.sleep(1)

##Voice_1

if distance1 < 10:
    os.system("espeak ' ' + "OBSTACLE DETECTED PLEASE WAIT" + " ' ' ")
    GPIO.output(motorA,0)
    GPIO.output(motorB,0)
    GPIO.output(motorC,0)
    GPIO.output(motorD,0)
    time.sleep(1)
    GPIO.output(motorA,1)
    GPIO.output(motorB,0)
    GPIO.output(motorC,1)
    GPIO.output(motorD,0)
    time.sleep(3)

    os.system("espeak ' ' + "TROLLEY MOVE RIGHT" + " ' ' ")
    time.sleep(1)
    GPIO.output(TRIG1, False)          #Set TRIG as LOW

```

```
print ("Waitng For Sensor To Settle")
```

```
GPIO.output(TRIG1, True)          #Set TRIG as HIGH
time.sleep(0.00001)                #Delay of 0.00001 seconds
GPIO.output(TRIG1, False)          #Set TRIG as LOW
```

```
while GPIO.input(ECHO1)==0:        #Check whether the ECHO is LOW
    pulse_start1 = time.time()      #Saves the last known time of LOW pulse
```

```
while GPIO.input(ECHO1)==1:        #Check whether the ECHO is HIGH
    pulse_end1 = time.time()        #Saves the last known time of HIGH pulse
```

```
print("working1")
```

```
pulse_duration= pulse_end1 - pulse_start1 #Get pulse duration to a variable
```

```
distance1= pulse_duration* 17150      #Multiply pulse duration by 17150 to
get distance
```

```
distance1= round(distance1, 2)        #Round to two decimal points
```

```
print("Distance:",distance1 - 0.5,"cm")
```

```
time.sleep(1)
```

```
##Voice_1
```

```
if distance1 < 10:
```

```
    os.system("espeak ' " + "OBSTACLE DETECTED PLEASE WAIT" + " ' ")
```

```
    GPIO.output(motorA,0)
```

```
    GPIO.output(motorB,0)
```

```
    GPIO.output(motorC,0)
```

```
    GPIO.output(motorD,0)
```

```
    time.sleep(1)
```

```

GPIO.output(motorA,0)
GPIO.output(motorB,0)
GPIO.output(motorC,1)
GPIO.output(motorD,0)
time.sleep(1)
os.system("espeak ' ' + "TROLLEY MOVE FORWARD" + " ' ")
time.sleep(1)
GPIO.output(TRIG1, False)          #Set TRIG as LOW
print ("Waitng For Sensor To Settle")

GPIO.output(TRIG1, True)           #Set TRIG as HIGH
time.sleep(0.00001)                #Delay of 0.00001 seconds
GPIO.output(TRIG1, False)          #Set TRIG as LOW

while GPIO.input(ECHO1)==0:        #Check whether the ECHO is LOW
    pulse_start1 = time.time()     #Saves the last known time of LOW pulse

while GPIO.input(ECHO1)==1:        #Check whether the ECHO is HIGH
    pulse_end1 = time.time()       #Saves the last known time of HIGH pulse
print("working1")
pulse_duration= pulse_end1 - pulse_start1 #Get pulse duration to a variable
distance1= pulse_duration* 17150     #Multiply pulse duration by 17150 to
get distance
distance1= round(distance1, 2)      #Round to two decimal points
print("Distance:",distance1 - 0.5,"cm")
time.sleep(1)

```

```

##Voice_1

    if distance1 < 10:

        os.system("espeak ' " + "OBSTACLE DETECTED PLEASE WAIT" + " ' ")

        GPIO.output(motorA,0)

        GPIO.output(motorB,0)

        GPIO.output(motorC,0)

        GPIO.output(motorD,0)

        time.sleep(1)

        GPIO.output(motorA,1)

        GPIO.output(motorB,0)

        GPIO.output(motorC,1)

        GPIO.output(motorD,0)

        time.sleep(3)

        GPIO.output(motorA,0)

        GPIO.output(motorB,0)

        GPIO.output(motorC,0)

        GPIO.output(motorD,0)

        time.sleep(1)

        os.system("espeak ' " + "TROLLEY REACHED FRUITS SECTION" + " ' ")

        time.sleep(1)

        os.system("espeak ' " + " RIGHT SIDE TRACK APPLE, ORANGE AND
PINEAPPLE" + " ' ")

        time.sleep(1)

        os.system("espeak ' " + " LEFT SIDE TRACK MANGO, BANANA AND
PAPAYA" + " ' ")

        time.sleep(1)

        os.system("espeak ' " + "START PURCHASE" + " ' ")

```

```

time.sleep(4)

while(1):
    x=ser1.readline()

    print(x)

    if(x==b'2B00E1A2274F'):
        if(a%2==0):
            amount+=40

            a+=1

            print("Apple :",amount,"Rs")

            os.system("espeak ' ' + "APPLE 40 RUPEES" + " ' ")

            ser1.write(b'*)

            ser1.write(str("Apple").encode())

            ser1.write(str(amount).encode())

            ser1.write(str("Rs").encode())

            ser1.write(b'#')

            ser1.write(b'*)

            ser1.write(str("Total AMOUNT").encode())

            ser1.write(str(amount).encode())

            ser1.write(str("Rs").encode())

            ser1.write(b'#')

            os.system("espeak ' ' + "TOTAL AMOUNT" + " ' ")

            os.system("espeak ' ' + str(amount) + " ' ")

            os.system("espeak ' ' + "RUPEES" + " ' ")

        elif(a%2==1):
            amount-=40

            a+=1

```

```

print("Apple :",amount,"Rs")
os.system("espeak ' ' + "APPLE REMOVED" + " ' ' ")
ser1.write(b'*)
ser1.write(str("Apple").encode())
ser1.write(str(amount).encode())
ser1.write(str("Rs").encode())
    ser1.write(b'#')
ser1.write(b'*)
ser1.write(str("Total AMOUNT").encode())
ser1.write(str(amount).encode())
ser1.write(str("Rs").encode())
ser1.write(b'#')
os.system("espeak ' ' + "TOTAL AMOUNT" + " ' ' ")
os.system("espeak ' ' + str(amount) + " ' ' ")
os.system("espeak ' ' + "RUPEES" + " ' ' ")
if(x==b'2B00E19E4317'):
    if(b%2==0):
        amount+=30
        b+=1
        print("Mango :",amount,"Rs")
        os.system("espeak ' ' + "MANGO 30 RUPEES" + " ' ' ")
        ser1.write(b'*)
        ser1.write(str("Mango").encode())
        ser1.write(str(amount).encode())
        ser1.write(str("Rs").encode())
        ser1.write(b'#')

```

```

ser1.write(b'')
ser1.write(str("Total AMOUNT").encode())
ser1.write(str(amount).encode())
ser1.write(str("Rs").encode())
ser1.write(b'#')
os.system("espeak ' " + "TOTAL AMOUNT" + " ' ")
os.system("espeak ' " + str(amount) + " ' ")
os.system("espeak ' " + "RUPEES" + " ' ")

```

```

elif(b%2==1):

```

```

    amount-=30
    b+=1
    print("Mango :",amount,"Rs")
    os.system("espeak ' " + "MANGO REMOVED" + " ' ")
    ser1.write(b'')
    ser1.write(str("Mango").encode())
    ser1.write(str(amount).encode())
    ser1.write(str("Rs").encode())
    ser1.write(b'#')
    ser1.write(b'')
    ser1.write(str("Total AMOUNT").encode())
    ser1.write(str(amount).encode())
    ser1.write(str("Rs").encode())
    ser1.write(b'#')
    os.system("espeak ' " + "TOTAL AMOUNT" + " ' ")

```

```

os.system("espeak ' " + str(amount) + " ' ")
os.system("espeak ' " + "RUPEES" + " ' ")

```

```

if (str(x,('utf-8'))=="choclates" or str(x,('utf-8'))=="o"):
    print("working")
    ser.write(b'w')
    os.system("espeak ' " + "TROLLEY MOVE TO FRUITS SECTION" + " ' ")
    time.sleep(1)
    os.system("espeak ' " + "TROLLEY MOVE FORWARD" + " ' ")
    time.sleep(1)
    GPIO.output(TRIG1, False)          #Set TRIG as LOW
    print ("Waitng For Sensor To Settle")
    GPIO.output(TRIG1, True)           #Set TRIG as HIGH
    time.sleep(0.00001)                #Delay of 0.00001 seconds
    GPIO.output(TRIG1, False)          #Set TRIG as LOW

    while GPIO.input(ECHO1)==0:        #Check whether the ECHO is LOW
        pulse_start1 = time.time()     #Saves the last known time of LOW pulse

    while GPIO.input(ECHO1)==1:        #Check whether the ECHO is HIGH
        pulse_end1 = time.time()       #Saves the last known time of HIGH pulse
    print("working1")
    pulse_duration= pulse_end1 - pulse_start1 #Get pulse duration to a variable

```

```

distance1= pulse_duration* 17150      #Multiply pulse duration by 17150 to get
distance

distance1= round(distance1, 2)        #Round to two decimal points

print("Distance:",distance1 - 0.5,"cm")

time.sleep(1)

##Voice_1

if distance1 < 10:

    os.system("espeak ' ' + "OBSTACLE DETECTED PLEASE WAIT" + " ' ' ")

    GPIO.output(motorA,0)

    GPIO.output(motorB,0)

    GPIO.output(motorC,0)

    GPIO.output(motorD,0)

    time.sleep(1)

GPIO.output(motorA,1)

GPIO.output(motorB,0)

GPIO.output(motorC,1)

GPIO.output(motorD,0)

time.sleep(3)

os.system("espeak ' ' + "START PURCHASE" + " ' ' ")

time.sleep(1)

while(1):

    x=ser1.readline()

    print(x)

    if(x==b'2B00E1A2274F'):

        if(a%2==0):

            amount+=25

            a+=1

```

```

print("Dairy milk :",amount,"Rs")

os.system("espeak ' ' + "DAIRY MILK 25 RUPEES" + " ' ' ")

ser1.write(b'*)

ser1.write(str("Dairy milk").encode())

ser1.write(str(amount).encode())

ser1.write(str("Rs").encode())

ser1.write(b'#')

ser1.write(b'*)

ser1.write(str("Total AMOUNT").encode())

ser1.write(str(amount).encode())

ser1.write(str("Rs").encode())

ser1.write(b'#')

os.system("espeak ' ' + "TOTAL AMOUNT" + " ' ' ")

os.system("espeak ' ' + str(amount) + " ' ' ")

os.system("espeak ' ' + "RUPEES" + " ' ' ")

```

```

elif(a%2==1):

```

```

    amount-=25

    a+=1

    print("Dairy :",amount,"Rs")

    os.system("espeak ' ' + "DAIRY MILK REMOVED" + " ' ' ")

        ser1.write(b'*)

    ser1.write(str("Dairy milk").encode())

    ser1.write(str(amount).encode())

    ser1.write(str("Rs").encode())

```

```

ser1.write(b'#')
ser1.write(b'*)
ser1.write(str("Total AMOUNT").encode())
ser1.write(str(amount).encode())
ser1.write(str("Rs").encode())
ser1.write(b'#')

os.system("espeak ' " + "TOTAL AMOUNT" + " ' ")

os.system("espeak ' " + str(amount) + " ' ")

os.system("espeak ' " + "RUPEES" + " ' ")

if(x==b'2B00E19E4317'):
    if(b%2==0):
        amount+=20

        b+=1

        print("Five star :",amount,"Rs")

        os.system("espeak ' " + "FIVE STAR 20 RUPEES" + " ' ")

        ser1.write(b'*)
        ser1.write(str("Five star").encode())
        ser1.write(str(amount).encode())
        ser1.write(str("Rs").encode())
        ser1.write(b'#')
        ser1.write(b'*)
        ser1.write(str("Total AMOUNT").encode())
        ser1.write(str(amount).encode())
        ser1.write(str("Rs").encode())
        ser1.write(b'#')

        os.system("espeak ' " + "TOTAL AMOUNT" + " ' ")

```

```

os.system("espeak ' " + str(amount) + " ' ")
os.system("espeak ' " + "RUPEES" + " ' ")

elif(b%2==1):
    amount-=20
    b+=1
    print("Five star :",amount,"Rs")
    os.system("espeak ' " + "FIVE STAR REMOVED" + " ' ")
    ser1.write(b'*')
    ser1.write(str("Five star").encode())
    ser1.write(str(amount).encode())
    ser1.write(str("Rs").encode())
    ser1.write(b'#')
    ser1.write(b'*')
    ser1.write(str("Total AMOUNT").encode())
    ser1.write(str(amount).encode())
    ser1.write(str("Rs").encode())
    ser1.write(b'#')
    os.system("espeak ' " + "TOTAL AMOUNT" + " ' ")
    os.system("espeak ' " + str(amount) + " ' ")
    os.system("espeak ' " + "RUPEES" + " ' ")

if (str(x,('utf-8'))=="vegetables" or str(x,('utf-8'))=="n"):
    ##          for i in range(0,1):
    print("working")
    ser.write(b'w')
    GPIO.output(motorA,0)

```

```

GPIO.output(motorB,0)
GPIO.output(motorC,1)
GPIO.output(motorD,0)
time.sleep(5)
GPIO.output(motorA,0)
GPIO.output(motorB,0)
GPIO.output(motorC,0)
GPIO.output(motorD,0)
time.sleep(1)
GPIO.output(motorA,1)
GPIO.output(motorB,0)
GPIO.output(motorC,1)
GPIO.output(motorD,0)
time.sleep(3)
os.system("espeak ' " + "START PURCHASE" + " ' ")
time.sleep(4)
while(1):
    x=ser1.readline()
    print(x)

    if(x==b'270055108FED'):
        if(a%2==0):
            amount+=40
            a+=1
            print("tomato :",amount,"Rs")
            os.system("espeak ' " + "TOMATO 40 RUPEES" + " ' ")

```

```

ser1.write(b'')
ser1.write(str("Tomato").encode())
ser1.write(str(amount).encode())
ser1.write(str("Rs").encode())
ser1.write(b'#')
ser1.write(b'')
ser1.write(str("Total AMOUNT").encode())
ser1.write(str(amount).encode())
ser1.write(str("Rs").encode())
ser1.write(b'#')

os.system("espeak ' " + "TOTAL AMOUNT" + " ' ")
os.system("espeak ' " + str(amount) + " ' ")
os.system("espeak ' " + "RUPEES" + " ' ")

```

```

elif(a%2==1):
    amount-=40
    a+=1
    print("tomato :",amount,"Rs")
    os.system("espeak ' " + "TOMATO REMOVED" + " ' ")
    ser1.write(b'')
    ser1.write(str("Tomato").encode())
    ser1.write(str(amount).encode())
    ser1.write(str("Rs").encode())
    ser1.write(b'#')
    ser1.write(b'')
    ser1.write(str("Total AMOUNT").encode())

```

```

ser1.write(str(amount).encode())
ser1.write(str("Rs").encode())
ser1.write(b'#')
os.system("espeak ' " + "TOTAL AMOUNT" + " ' ")
os.system("espeak ' " + str(amount) + " ' ")
os.system("espeak ' " + "RUPEES" + " ' ")

```

```

if(x==b'2B00E19E4317'):

```

```

    if(b%2==0):

```

```

        amount+=20
        b+=1
        print("Potato :",amount,"Rs")
        os.system("espeak ' " + "POTATO 20 RUPEES" + " ' ")
        ser1.write(b'*)
        ser1.write(str("Potato").encode())
        ser1.write(str(amount).encode())
        ser1.write(str("Rs").encode())
        ser1.write(b'#')
        ser1.write(b'*)
        ser1.write(str("Total AMOUNT").encode())
        ser1.write(str(amount).encode())
        ser1.write(str("Rs").encode())
        ser1.write(b'#')
        os.system("espeak ' " + "TOTAL AMOUNT" + " ' ")
        os.system("espeak ' " + str(amount) + " ' ")
        os.system("espeak ' " + "RUPEES" + " ' ")

```

```

elif(b%2==1):
    amount-=20
    b+=1
    print("Potato :",amount,"Rs")
    os.system("espeak ' " + "POTATO REMOVED" + " ' ")
    ser1.write(b'*')
    ser1.write(str("Potato").encode())
    ser1.write(str(amount).encode())
    ser1.write(str("Rs").encode())
    ser1.write(b'#')
    ser1.write(b'')
    ser1.write(str("Total AMOUNT").encode())
    ser1.write(str(amount).encode())
    ser1.write(str("Rs").encode())
    ser1.write(b'#')
    os.system("espeak ' " + "TOTAL AMOUNT" + " ' ")
    os.system("espeak ' " + str(amount) + " ' ")
    os.system("espeak ' " + "RUPEES" + " ' ")

```

CHAPTER 5

CONCLUSION

CONCLUSION

By suggests that of this project intent to vary the asking methodology, turn out it swift and increase the safety victimization RFID technique. this might take the ultimate looking expertise to a singular level. completely totally different parameters similar to the system parameters of wise tramcar like product name, product worth etc. Thus, with the assistance of the conclusion we have a tendency to tend to are ready to say that:

- Automatic asking of material/product by victimization RFID technique are further viable different among the long run.
- The system supported RFID technique is economical and compact and shows ultimate performance.
- By using of the RFID Technique, we will get
 - Higher Productivity
 - Increased Revenues
 - Improved Quality data capture
 - Shorter Process
 - Lower cost
 - Improved Regulatory Compliance
 - Better Security
 - Accurate and Relevant Management info

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