

VEHICLE THEFT SAFETY AND ACCIDENT PREVENTION AND ALERT SYSTEM USING WIRELESS TECHNOLOGY

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Engineering degree in Electronics & Communication Engineering

By

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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **YELURI ARAVIND DUTT(Reg. No. 37130455)** and **YEMIREDDY NARESH KUMAR REDDY (Reg. No. 37130456)** who carried out the project entitled “**VEHICLE THEFT SAFETY AND ACCIDENT PREVENTION AND ALERT SYSTEM USING WIRELESS TECHNOLOGY**” under our supervision from December 2020 to April 2021.

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We, **YELURI ARAVIND DUTT(Reg.No.37130455)** and **YEMIREDDY NARESH KUMAR REDDY (Reg. No. 37130456)** here by declare that the Project Report entitled **“Vehicle Theft Safety and Accident Prevention and Alert System Using Wireless Technology”** done by us under the guidance of **Ms.D.Jamuna Rani M.E.,(Ph.D.)**, at Sathyabama Institute of Science and Technology is submitted in partial fulfillment of the requirements for the award of **Bachelor of Engineering** degree in **Electronics and Communication Engineering**.

DATE: 19-4-2021

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ABSTRACT

Vehicle trailing today is becoming more and more difficult over time today, and it is more and more difficult to track these vehicles for safety reasons. Nowadays, people are more concerned with keeping them safe with the latest technology. We have to guarantee the condition and place of automobile. Excessive stress, drowsiness and lack of concentration, were few of important factors that affect the drivers and which paves traffic jams and even accidents. One of the difficulties which have bought the attracted in the field of research of reduce of harmful effects, that impact generation of tools that play major role in the checking and also calculating of the driver attitude.

In this project, we can monitor the place of automobile and accident notification. Whenever the vehicle is switched on, an intimation message has been sent to owner's mobile, it also helps to get the information about stolen vehicle. That the alcohol sensor have sense of the alcoholic value that only moving will not be turned on. If the vehicle met with an accident, the vibration sensor detects the moment the threshold range and the message will be sent to respective person along with GPS location.

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CHAPTER-1

INTRODUCTION

Recently, site visitors on roads has been growing unexpectedly due to which it's miles turning into extraordinarily tough to manipulate automobiles in phrases of site visitors management, automobile robbery and accidents. According to Man sell, one in each forty two automobile with inside the United States is stolen estimating a lack of over \$nine billion in line with annum. A range of gear and strategies are used to decrease the possibility of such incidents while stretaining the protection of the humans involved. Vehicle monitoring is an antique idea and has been carried out throughout the globe for monitoring stolen automobiles or a few instances for private protection.

The majority of these arrangements depend on PC programs that show the guide of active vehicles indicating their location on the map.The location of these vehicles appears on the guide in type of a flickering shaded dab.

The motivation behind this work is to introduce ease and precise vehicle following system for security reason. It opens the entryway for vehicle following as well as traffic the board, leaving the executives, speed limit authorization.

1.1 EMBEDDED SYSTEM

An set up framework is a regulator custom designed and limited through an ongoing operating system (RTOS) with dependent ability with in a larger mechanical or electric framework, often with non-stop usage of inserted frameworks processing imperatives.

It is consolidated as unit of a completely gadget in some cases both equipment and mechanical parts. Embedded systems reduces maximum components in common working in now a days. Ninety-eight in of all microprocessors were produce to keep as embedded system ports.

Similar of characters of hard embedded deices will be seen in normal-use counter parts are small electricity usage, small size, flinty operating values, and less per-unit cost.They could came at the price of lesser rectifying resources, which make them similar much and much complex to program and to be in touch with levels as well as provide augmented functions, well beyond those available. For example, smart it techniques can be made to do current.

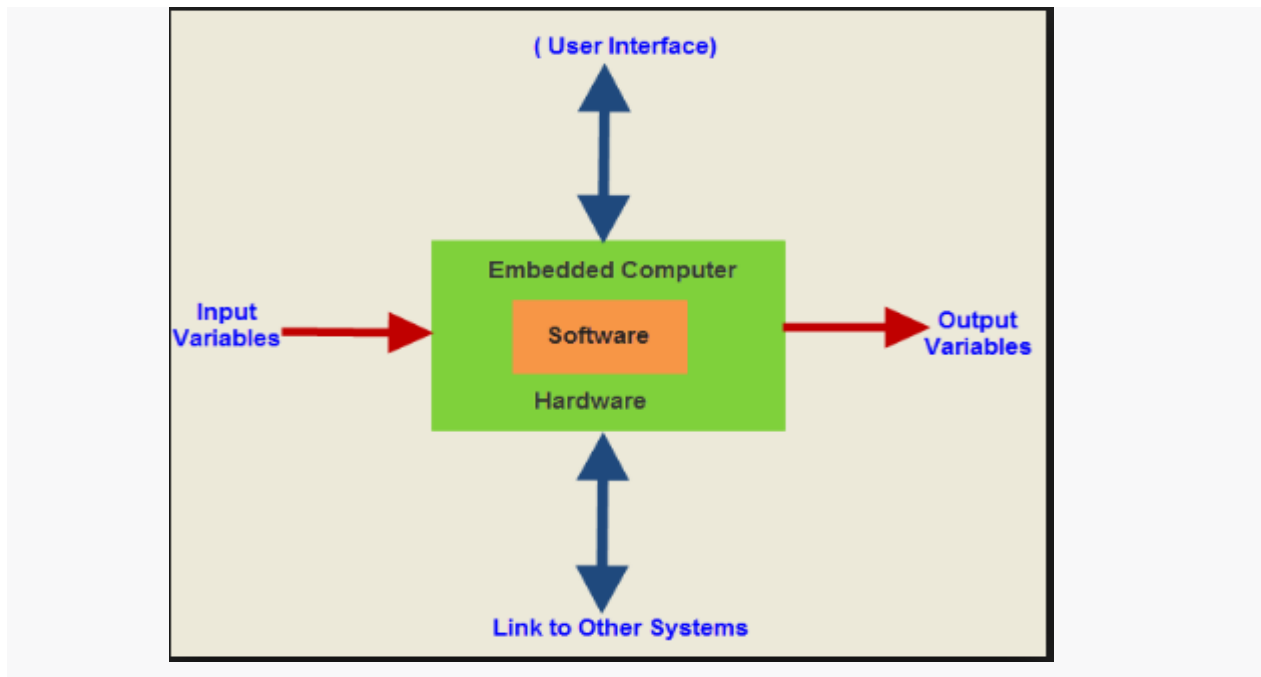


Fig.1.1: Electronic Voting Machine

Installed frameworks are ordinarily found in purchaser, mechanical, auto, clinical, business and military applications.

Suspensions gadgets utilizes different consolidated frameworks from telephone catches for the ability to phones toward the end client. PC association utilizes a lot of incredible switches and keep up to direct information.

Customer gadgets incorporate MP3 players, cell phones, computer game consoles, computerized cameras, GPS collectors, and printers.

1.2 CLASSIFICATIONS OF EMBDDED SYSTEMS

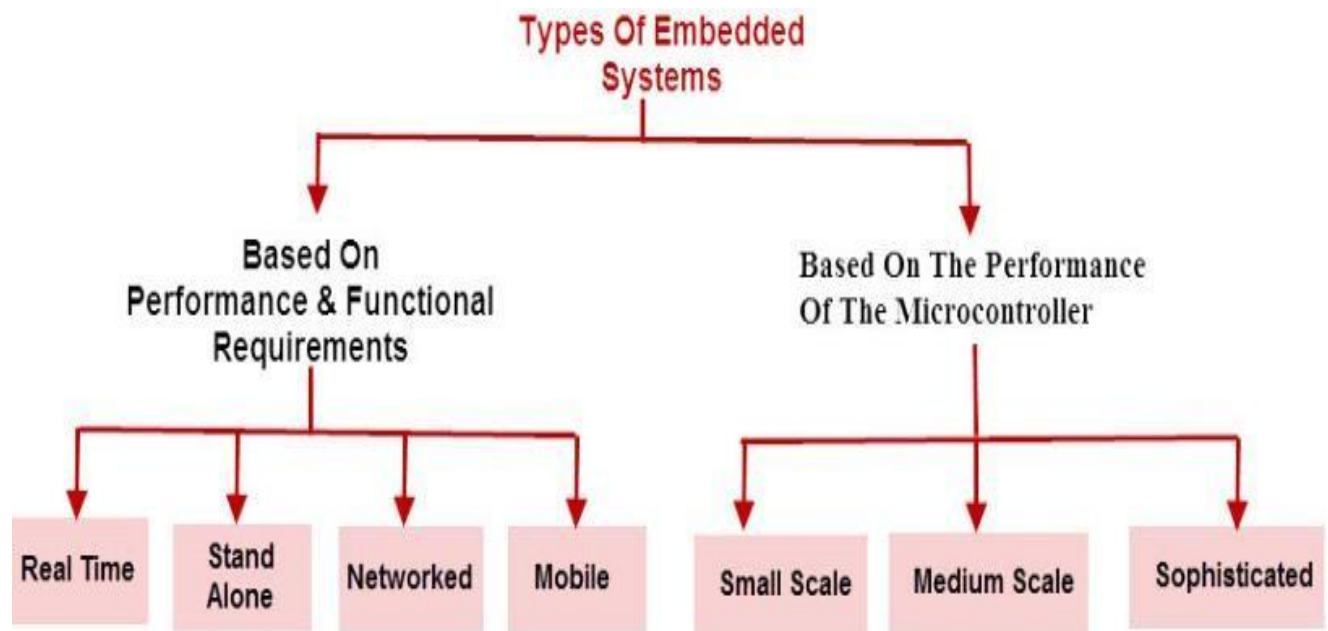


Fig .1.2: Types of Embedded Systems

Late innovation critical air devices will be managing the related termagnets to all of the greater short and plenty better manage temperature which could extra through season of day and season. Home robotization makes use of wired-and far flung frameworks that allows you to be applied to lower lights, environment, security, well known media, observation, and so forth, all of which make use of implanted devices for detecting and controlling.

Comparable, industrial facility regulators, and all the more close frameworks like blended vehicles, X-ray, and flying Installed frameworks range by useful things such as create watch and micro players, to huge fixed decisions. Unpredictability changes from low, with a single microcontroller.

1.3 Block diagram of an embedded system

The combined devices generally will have an embedded processor. More applications would be having the digital surface heat waves, Vsr, cars will used embedded systems. Few embedded systems having an operating device. All remaining were very proven outcomes in the all the logic being developed like one program. Those devices were combined into some device for few specific uses other than to give usage of doing coding.

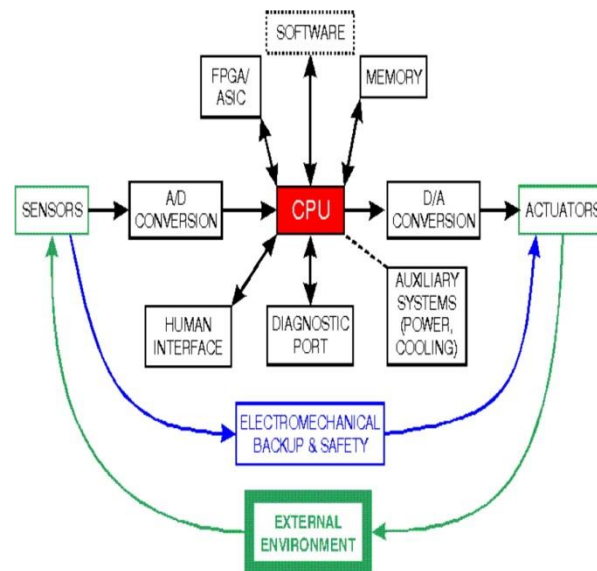


Fig.1.3: Square graph of a regular implanted framework

1.4 EMBEDDED SYSTEMS APPLICATIONS

- Inserted frameworks in cars incorporate engine control, voyage control, body security, engine safety, mechanical technology in a sequential construction system, car multimedia, car entertainment, E-com access, mobiles and so on Embedded devices having in telecommunications has connecting working, mobile connecting, and no connection and etc.

- banking, telephone and useful features.
- Embedded components were also present in many solar devices and nuclear bombs also will be present in field of army, defense, communication, and aerospace.
- Embedded systems will also be in automobiles & some tools include image capturing , linking systems, printing machines , power tools, desktops also in various and displays.
- Embedded Systems in digital consumer electronics includes set-top boxes, DVDs, high-definition TVs and digital camera.

CHAPTER-2

LITERATURE REVIEW

Sarker, S., Rahman, M. S., & Sakib, M. N. (2019, December) Advancement in transportation framework has helped speed of our lives. In our extra energy, street traffic stunts are considered as genuine wellbeing worldwide issue making gigantic misfortunes of lives, Many things and significant time. They have seen as just few or one of the of most elevated pace of death these days. Mishap makes ruinous circumstance for influenced individuals life, especially mishap happens in interstates creates huge enormous effect on huge quantities of casualties. In this paper, we make a shrewd mishap recognition, area following and warning framework that recognizes a mishap promptly when it happens. Worldwide Positioning System(GPS)device tracks down the right spot of mishap. Global System for Mobile (GSM) will do send an alarm message joining the connection of spot of the asset guide to the close to police any room and emergency clinic so they could see the connection, discover the briefest course of the mishap spot and take activities to accelerate the salvage cycle.

Ahmed, S. U., Uddin, R., & Affan, M. (2020, September) in this proposed project the evolution of a safe appliance with inventive and life helping attributes. The advancement of a savvy cap requires the free from any and all harm of a driver or a representative from a generally perspective. The wise security mishap recognition gauge were joined by shrewd a danger. The security state of different parts that are coded and helped by a Raspberry Pi microcomputers. This answer is checked and come about with one of a kind versatile applications for decreasing boundaries. The presentation associated with the cap gives sign of controlling boundaries. The framework configuration is more and cost-mindful including manual and vehicle-charging arrangements. The interesting methodologies utilized makes it effective and profitable as indicated by various applications.

Gupta, A., Dedhia, H., Hingu, H., & Chaugule, A. (2020) In this paper, a structure for vehicle accident management using wireless networks is proposed and thought. We gift included wi-fi network structure for subsequent technology all IP wi-fi networks which helps our framework. In this structure we display that extraordinary wi-fi Networks can offer Internet get right of entry to for transferring vehicles. A new dispensed gadget is advanced to control automobile accidents (anywhere, anytime) such that it transfer twist of fate conversation with the visitors police department, hospital, and Insurance company.

Kumar, N., Barthwal, A., Lohani, D., & Acharya, D. (2020, March) The rapid development of technology has brought opportunities to the world, which will enable intelligent transportation systems (ITS) to solve the problem of traffic accidents, which are considered to be one of the biggest problems in preventing personal injuries worldwide. ECall is an initiative of the European Union (EU) to provide prompt assistance at the scene of an accident. This article 1 introduces HDy Copilot, which is an automatic alarm detection application that integrates into multi-mode alarm propagation through eCall and IEEE 802.11p (ITS-G5).

Receive road side warnings from other nearby vehicles, and cancel the count down process to falsely detect traffic accidents. HDy Copilot is designed for the Android operating system because it provides an open source API that allows access to its hardware resources. Tested and connected to a prototype based on IEEE 802.11p. The results obtained are related to how the application successfully detects conflicts, broadcasts, executes Call, and sends minimum record (MSD) and distributed environmental notification messages (DENM).

Ahmed (UnitedStates), Uddin R. andAffan M. (September 2020) The exposure of motorcyclists in a high-speed accident without a helmet is very dangerous and can be fatal. It can save lives.In many countries,such as Malaysia, people who ride a motorcycle while riding a motorcycle must wear a helmet. Therefore, the project has been specially designed to improve the safety of motor cyclists.If the speed limit is exceeded, an alarm will be issued.The force sensor resistor (FSR) and BLDC fan are used to sense the rider's head and measure the speed of the motor cycle.The 315 MHz RF module is used as a wireless communication channel to exchange data between the transmitter circuit and the receiver circuit. After wearing the helmet, the motorcycle engine will start.When the engine speed exceeds 100 km/h, the ALED flashes

Sharma, R. and Kumar, G. (October 2020) Motorcycles are the main cause of road traffic accidents in Indonesia, 83% of which are caused by human factors. Examples include pot holes, speed bumps and missing traffic signs. Intermis of deaths, the number of deaths was the highest in 2011, at 22.4% of 145,478 victims. Head injuries are the main victim in 70% of cases. In the statistics, motorcyclists should use helmets as front protection devices and ensure that the seat belts are securely locked. To solve this problem, this research introduces a helmet system that notifies the driver when the driver encounters a hazard that may cause danger. traffic accident. These factors occur when the driver does not wear a helmet, does not wear a seat belt, and exceeds the speed limit. In addition, this research also provides a new feature that can warn drivers when they cross unsafe pit lanes (such as pit lanes or speed bumps). Due to poor road conditions in Indonesia, this feature is provided. According to the test results, the average response time of the smart helmet system in this study when using the helmet and seat belt lock detection system is 1.4 seconds, which is 0.3 seconds

Kashevnik A., Ponomarev A. andKrasov A. (April 2020) in developing countries like India. With the development of traffic technology and the increase in the total number of vehicles, the number of traffic accidents is increasing rapidly. Advances in technology have also increased

the danger of road traffic. Two-wheelers account for 25% of all road deaths. As a result, the proportion of frequent traffic accidents is increasing and causes huge casualties. But most of them are powerless. An intelligent two-wheeler accident prevention and detection system to ensure the safety of human life. Part of the preventive measures includes smart helmets, which can automatically check whether a person wears a helmet and breathes alcohol-free while driving.

CHAPTER-3

3.1 EXISTINGSYSTEM

- In existing system, they used accident notification systems, so we can get the alert messages whenever the accident occurs.
- For the accident prevention they used smart helmet method, so the helmet will alert the driver.
- In existing system, the algorithm-based approaches are used for the accident alert conditions and location access.
- In existing system, the theft control is done by using camera-based approach, but the face recognition has some problems while using with twins or any mask-based conditions.

Disadvantage:

- By using camera-based approach, the privacy is affected.
- Algorithm based approach is not must effective.

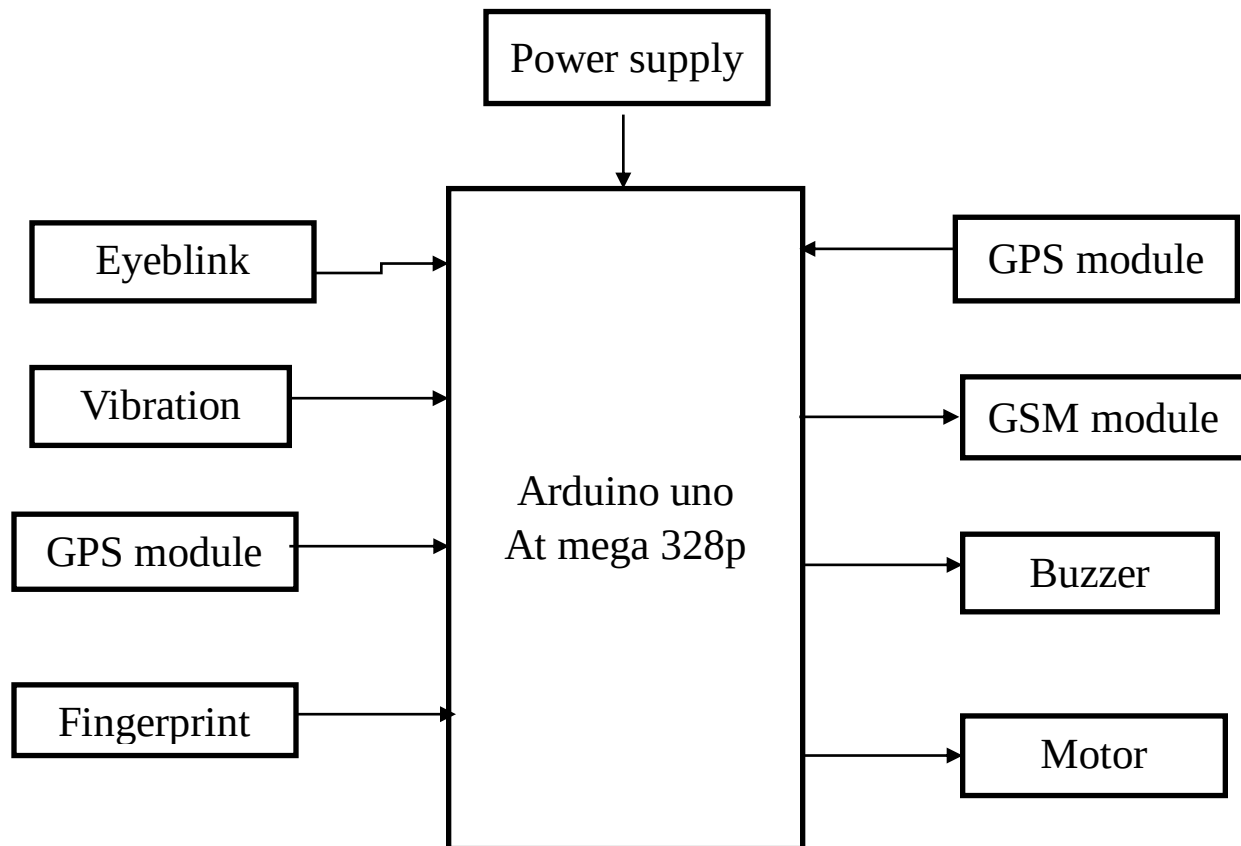
3.2 PROPOSED SYSTEM

- In proposed system, we are using accident prevention by using eyeblink sensor and as well as notification through message.
- Unlike the helmet-based approach the eyeblink sensor will useful for the any vehicle drivers.
- We are using fully sensor-based approach, so the accident prevention and notification will be better in this approach.

Advantage:

- By using biometric, the vehicle is more secured.
- Message can be immediately sending the respective person, so that the death can be educed.

3.3 BLOCK DIAGRAM



3.4 HARDWARE REQUIREMENTS

- ArduinoUNO.
- Eyeblink sensor.
- Ultrasonicsensor.
- Vibration sensor.

- Finger printmodule.
- GPSmodule.
- GSMmodule.
- Buzzer.
- Motordriver.
- Dcmotor.

3.5 SOFTWARE REQUIREMENTS:

- ArduinoIDE.
- EmbeddedC.

3.6 HARDWARE COMPONENTSDETAILS

3.6.1 ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328P (datasheet). It has 14 general purpose digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ATmega328P microcontroller, a USB Type-B connector with ATmega328P microcontroller, a USB Type-B connector with ATmega328P microcontroller, a USB Type-B connector with ATmega328P microcontroller, and a reset button. It carries all that expected to help.

It microcontroller; just associate it to a PC with a USB link or force it with an air conditioner to-DC connector or battery to begin. The Uno contrasts from all former boards in that it does not use the FTDIUSB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to variation R2) redid as a USB-to-ongoing converter. Change 2 of the Uno board has a resistor pulling the 8U2 HWB line to ground, simplifying it to put into DFU mode. Alteration 3 of the board has the going with new features:

- pinout: added SDA and SCL pins that are close to the AREF pin and two other new pins set close to the RESET pin, the IOREF that permit the safeguards to adjust to the voltage gave from the board. In future, safeguards will be viable both with the board that utilization the AVR, which work with 5V and with the Arduino Due that work with 3.3V. The subsequent one is a not associated pin, that is saved for future purposes.

POWER:

The information voltage to the Arduino board when its using an outer pressure source (in place offive volts from the USB affiliation or different directed pressure source). You can deliver voltage via this pin, or, if supplying voltage through the pressure jack, get admission to it via this pin.

5V. This pin yields a controlled 5V from the controller at the board. The board can be furnished with energyboth from the DC energy jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V).

3V 3. A 3.3-volt deliver produced by means of the on-board controller. Most intense current draw is 50mA.

GND. Groundpins.

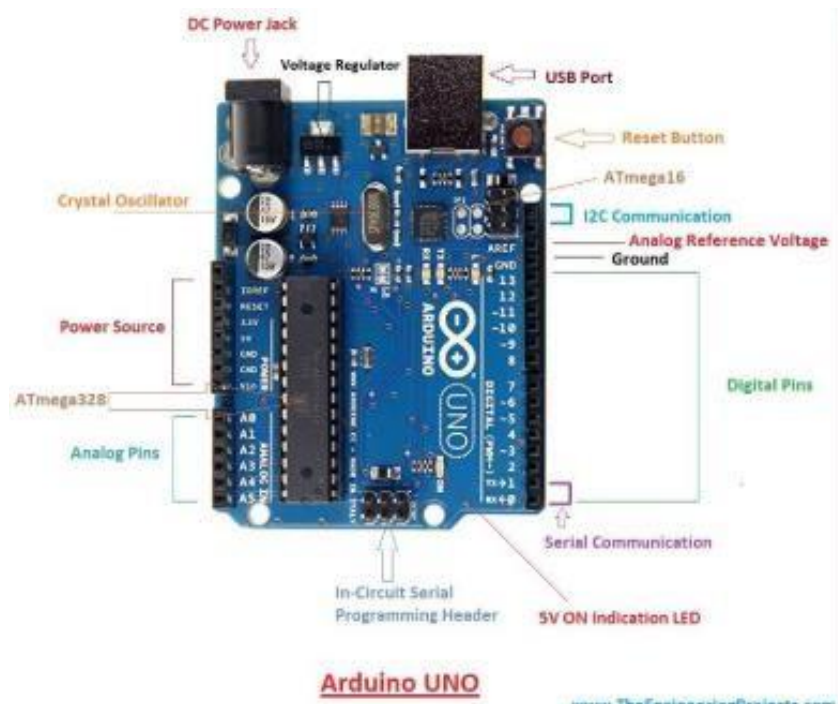


Fig.3.6.1: ARDUNO UNO

Memory

The ATmega328 has 32KB (with 0.5KB used for the bootloader). It also has 2KB of SRAM and 1KB of EEPROM (which can be read and written with the EEPROM library).

operate at 5 volts. Each pin can provide or receive a maximum of 40 mA and has an internal pull-up resistor (disconnected by default) of 20-50 kilo Ohms.

In addition, a couple of pins have explicit limits:

- Serial: 0 (RX) and 1 (TX). Used to get (RX) and convey (TX) TTL successive data. These pins are related with the contrasting pins of the ATmega8U2 USB-with TTL Sequential chip.
- External Interferes with: 2 and 3. These pins can be masterminded to trigger a prevent on allow regard, arising or falling edge, or a change in regard. See the annex Hinder () work for nuances.
- PWM: 3, 5, 6, 9, 10, and 11. Outfit 8-digit PWM yield with the basic Compose () work.

- LED: 13. There is an understood Driven related with cutting edge pin 13. Exactly when the pin is HIGH worth, the Drove is on, when the pin is LOW, it's off. The Uno has 6 basic information sources, named A0throughA5,By default, they measure from ground to 5 volts, anyway is it possible to change the upper completion of their range using the AREF pin and the basic Reference () work. Moreover, a couple of pins have specific helpfulness:

- TWI: A4 or SDA pin and A5 or SCL pin. Support TWI correspondence using the Wire library. There a few unique pins on the board:

- Reset. Bring this line LOW to reset the microcontroller. Customarily used to add a reset catch to shields which block the one on the board. See in like manner the arranging between Arduino pins and ATmega328 ports. The making arrangements for the Atmega8, 168, and 328 is in distinguishable. Communication The Arduino Uno has an umbe of facilities for talking with a PC, another Arduino, or other microcontrollers.

The ATmega328 gives UART TTL (5V) sequential correspondence, which is available on digital pins0(RX)and1(TX).An AT mega 16U2 on the board channels this sequential correspondence over USB and shows up as a virtual com port to programming on the PC. The '16U2 firmware utilizes the standard USB COM drivers, and no outside driver is needed.

Not with remaining, on Windows, a. in record is required. The Arduino programming joins a persistent screen which grants essential abstract data to be dispatched off and from the Arduino board. The TXLED kid the board will streak when data is being sent through the USB-to-successive chip and USB relationship with the PC (anyway not for consecutive correspondence on pins 0 and 1). A Product Sequential library contemplates successive correspondence on any of the Uno's digital pins.The AT mega 328 additionally upholds I2C (TWI) and SPI correspondence. The Arduino programming joins a Wire library to develop use of the I2C transport; see the documentation for nuances. For SPI correspondence, use the SP Ilibrary.

3.7 PIN CONFIGURATION

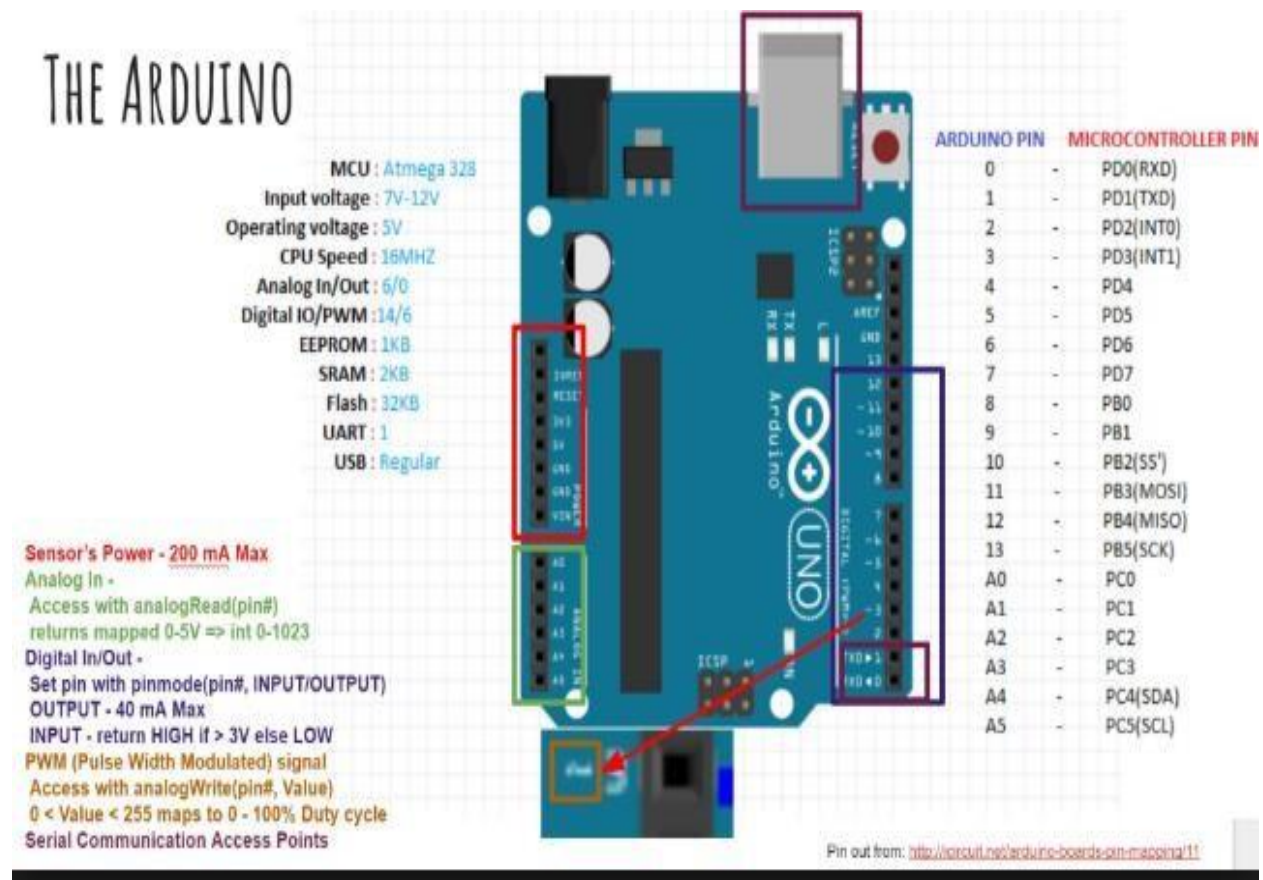


Fig. 3.7: PIN CONFIGURATION

USB Overcurrent Protection

That device uno was set at a table melt and do that safe guard your system computer's USB by various ports and overcurrent. Also several systems provide their own internal security, the fuse provides an more layer of protection. By that it can have huge amount than 500 were applied to the USB port, the fuse will automatically break the connection by that time or the short or extra load is removed.

Physical Characteristics

The maximum length and width of the Uno PCB are 2.7 and 2.1 inches separately, from the port surface or and power port broadening beyond the before measurement.

Four screw openings permit the board to be connected to a surface or case. Note that the distance between advanced pins 7 and 8 is 160 mil (0.16"), not an even various of the 100-mil separating of different pins..

3.8 EYE BLINKSENSOR

Here we make use of the CNY70IR transmitter. It is a reflective sensor that contains infrared manufacturer and phototransistor in a lead bundle which blocks sizeable light. One number one circumstance is that the IR transmitter and collector must be in an orderly style for best execution. The transmitter sends IR beams into the attention of the driver. Contingent upon whether or not they are close or open, there might be excessive yield for close eye and coffee yield for open eye. The dispatched signal is stuck via way of means of the IR receiver. This beneficiary is related to the comparator. The comparator is an opamp wherein the reference voltage is given to rearranging enter terminal and the yield of collector is given to non-reversing terminal. At the factor while the IR transmitter passes the beams to the beneficiary, the recipient is main due to the manner that non changing enter voltage isn't always precisely remodeling enter voltage. Presently the yield of comparator is GND, so yield is given to microcontroller.

Block Diagram for Eye Blink Sensor

Every one of the squares of the Eye-Squint Identification Framework are assembled and the design is tried. We interfaced the CNY70 alongside the 8051 Microcontroller and the Ringer. The essential square graph of the whole set-in the mood for recognizing the eye squint rate and cautioning the driver. Here is the square diagram of

3.8 Block Diagram of Eye Blink Sensor

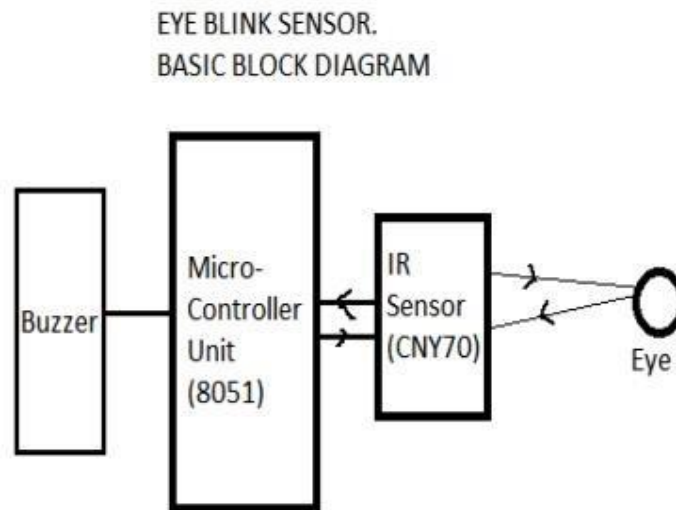


Fig. 3.8: Eye Blink Sensor

FEATURES

- EYE BLINK signal by LED
- Instant yield digital signal for directly connecting to interface
- Compact Size
- Working Voltage +5VDC

APPLICATION

Computerized Eye Blink screen for Vehicle Accident anticipation and Suitable for constant driving applications.

SPECIFICATION

- Voltage: +5V DC regulated
- Current: 100mA
- Output Data Level: TTL Level
- Eye Blink directed by LED and Output High Pulse

SENSOR

The regulated DC current range of 5 Volts. One wire is Ground, And the middle wire is Brown which is output and Red wire is positive supply. These wires are likewise set apart on PCB. To test sensor, you just need power the sensor by interface two wires +5V and GND. You can leave the yellow wire as it is. When Eye is closed, LED is off and the output is at 0V. Put Eye squint sensor glass on the face inside 15mm distance, and you can see the LED flickering on each Eyeblink. The output is dynamic high for Eye close and can be offered straight forwardly to microcontroller for interfacing applications.

EYE BLINK OUTPUT

5V(High) → Diode ON When Eye is close.

0V(Low) → Diode OFF when Eye is open.

3.8.1 ULTRASONIC SENSORS

A ultrasonic sensor is an instrument that measures the distance to an object utilizing ultrasonic sound waves. A ultrasonic sensor utilizes a transducer to send and get ultrasonic heartbeats that transfer back data about an object's nearness. High-recurrence sound waves reflect from limits to create unmistakable reverberation designs.

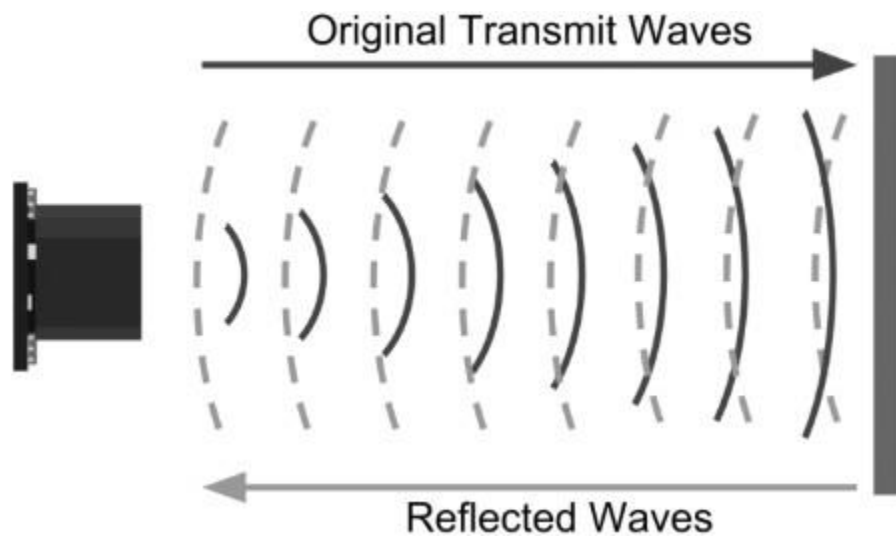


Fig.3.8.1

Ultrasound is reliable in any lighting environment and can be used inside or outside. Ultrasonic sensors can handle collision avoidance for a robot, and being moved often, as long as it isn't too fast.

3.9 ULTRASONIC SENSOR MODULE



Fig.3.9

Ultrasonics are so widely utilized, they can be dependably carried out in grain bin detecting applications, water level detecting, drone applications and detecting vehicles at your nearby drive-through eatery or bank.

- Presence
- Level

3.9.1 Characterizing sound wave

Sound is a mechanical wave going via the mediums, which is probably a solid, or fluid or gas. Sound waves can undergo the mediums with explicit properties predicated upon the mode of engendering.

3.9.2 Laws of physical science for sound waves

Sound People can recognize sounds in a recurrence range from about 20Hz to 20 KHz. Anyway the recurrence range typically utilized in ultrasonic identification is 100KHz to 50MHz. waves are having explicit frequencies or number of motions each second.

Where W = Frequency

C = Speed of sound in a medium

F = Recurrence of wave T = Time Period

The most widely recognized strategies for ultrasonic assessment use either longitudinal waves or shear waves. The longitudinal wave is a pressure wave in which the molecule movement is a similar way of the spread wave. The shear wave is a wave movement wherein the molecule movement is opposite to the heading of spread. Ultrasonic discovery presents high recurrence sound waves. The measure of time, taking for the sound to go through the medium and plentifulness of the got signal. In view of speed and time thickness can be determined. Thickness of material = Material sound speed $\times$ Season of Battle

3.9.3 Transducers for Wave Propagation and molecule recognition

For sending sound waves and accepting reverberation, ultrasonic sensors, typically called handsets or transducers will be utilized. The normally utilized transducers are contact transducers, point bar transducers, postpone line transducers, submersion transducers, and double component transducers. Contact transducers are normally utilized for finding voids and breaks to the external surface of a section just as estimating thickness. Point shaft transducers utilize the standard of reflection and mode change to deliver refracted shear or longitudinal waves in the test material.

Defer line transducers are single component longitudinal wave transducers utilized in conjunction with a replaceable delay line. One of the reasons for choosing delay line transducer is that close to surface goal can be improved. The postponement permits the component to quit vibrating before a return signal from the reflector can be received.

The significant benefits offered by inundation transducers over contact transducers are Uniform coupling diminishes affectability varieties, Reduction in check time, and builds affectability to little reflectors.

3.9.4 Operation of ultrasonic sensors

At the point when an electrical beat of high voltage is applied to the ultrasonic transducer it vibrates across a particular range of frequencies and produces an explosion of sound waves. Whenever any obstacle comes ahead of the ultrasonic sensor the sound waves will reflect back as reverberation and creates an electric heartbeat. It ascertains the time taken between sending sound waves and accepting echo. The reverberation examples will be contrasted and the examples of sound waves to decide recognized sign's condition.

3.9.5 Applications including Ultrasonic identification

The distance of impediment or discontinuities in metals is identified with speed of sound waves in a medium through which waves are taken a break taken for reverberation gathering. Subsequently the ultrasonic recognition can be utilized for discovering the distances between particles, for recognizing the discontinuities in metals and for showing the fluid level.

3.9.6 Ultrasonic Distance Measurement

Ultrasonic sensors are utilized for distance estimating applications. These devices routinely send a short explosion of ultrasonic sound to an objective, which mirrors the sound back to the sensor. The framework at that point estimates the ideal opportunity for the reverberation to get back to the sensor and registers the distance to the objective utilizing the speed of sound inside the medium.

Various kinds of transducers are used inside mechanically open ultrasonic cleaning devices .An ultrasonic transducer is affixed to a stainless steel pan which is loaded up with a dissolvable and a square wave is applied to it, giving vibration energy on the fluid.

The ultrasonic distance sensors estimates distance utilizing sonar; a ultrasonic (well above human hearing) beat is communicated from the unit and distance-to-target is controlled by estimating the time needed for the reverberation return. Yield from the ultrasonic sensor is a variable-width beatth at analyzes to the distance to the objective.

3.9.7 VIBRATION SENSOR

Vibration sensors will be sensors for estimating, showing, and dissecting straight speed, dislodging and vicinity, or speed increase.

Vibration — anyway unpretentious and undetected by human detects — is an indication of machine condition. Unusual vibration demonstrative of issues with a mechanical machine can be identified early and fixed before the occasion of machine disappointment; on the grounds that such a disappointment is possibly exorbitant as far as time, cost, and profitability, vibration estimation permits modern plants to build proficiency and set aside cash. The severity of machine vibration is standardized by the International Standards Organization (ISO) in the publication. The standard describes acceptable vibration levels for four different classes of machines.

- Vibration sensors are simply packaged as a raw sensor.
- Vibration transducers are slightly more complex sensors which output a voltage or current signal.
- Vibration transmitters are sensors packaged with the means (such as integral signal conditioners) to transmit a more complex output.
- Vibration switches use an integral sensor to make or break contact when certain vibration levels are detected.

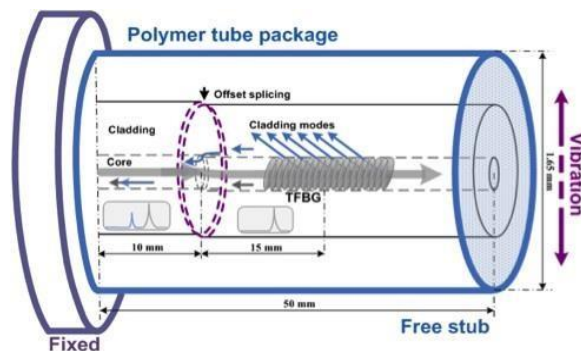


Fig.3.9.7

Prior to taking a vibration estimation, you need to append a sensor that can distinguish vibration conduct to the machine that is being estimated. Different sorts of vibration sensors are accessible, however a sort called accelerometer is ordinarily utilized as it offers benefits over different sensors. An accelerometer is a sensor that creates an electrical sign that is relative to the speed increase of the vibrating part to which the accelerometer is connected. The speed increase signal created by the accelerometer is gave to the instrument that thus changes the sign over to a speed signal. Contingent upon the client's decision, the sign can be shown as either a speed waveform or a speed range. A speed range is gotten from a speed waveform through a numerical estimation known as the Fast Fourier Transform or FFT.

The diagram below is a very simplistic explanation of how vibration data is acquired. You may wish to consult to their literature such as the vbSeries Instrument Reference Guide for further information

3.9.8 Vibration/Impact Sensor Circuit Schematic

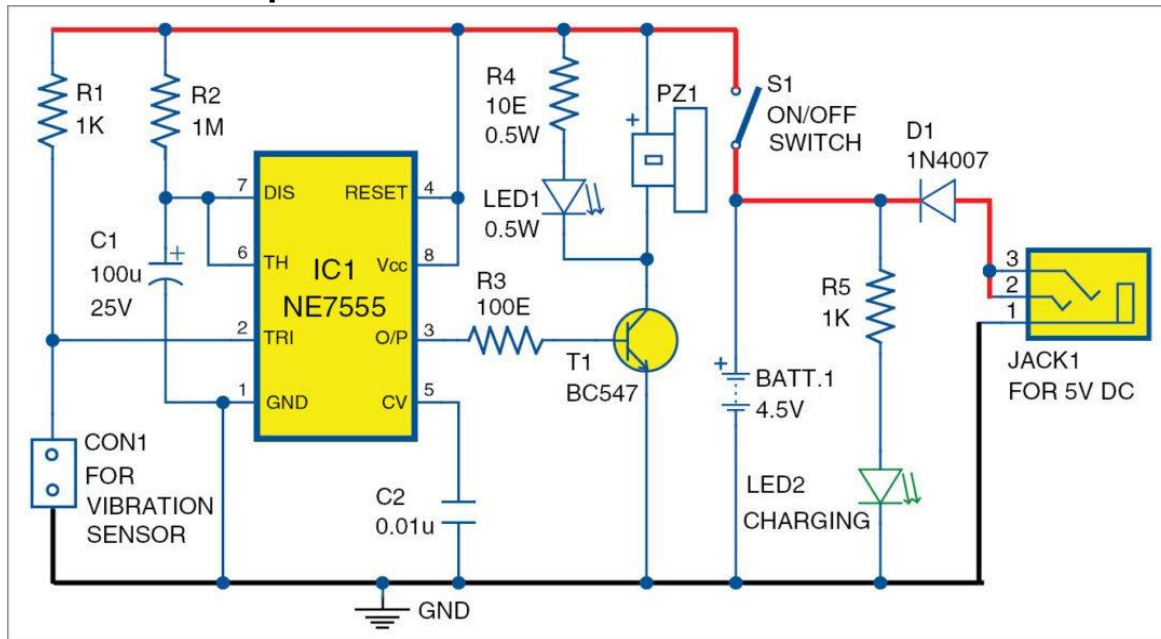


Fig.3.9.8 Vibration Schematic

The M74HC123 (IC1) is a rapid Double retriggerable CMOS MONOSTABLE MULTIVIBRATOR (MMV) manufactured with silicon gate CMOS technology, with all sources of info ensured against static release and transient overabundance voltage. There are two trigger sources of info, negative edge and positive edge. Here, just a single monostable part with positive edge setting off (pin 2) is utilized. Subsequent to setting off, the yield keeps up the monostable state for the time span controlled by the outside resistor R3 and capacitor C2.

3.10 FINGER PRINT SENSOR

Fingerprint scanners are security systems of biometrics. They are used to unlock doors and in other security applications. During the 2010s fingerprint scanners became commonplace.



Fig. 3.10: Finger Print Sensor

By and by there are a few challenges with this strategy: the pictures acquired with wet and dry fingers are very different and, in addition, the system is sensitive to dust and soil on a superficial level. The unit has an impressive size, unreasonable and costly. This system is easy to cheat and if the skin is damaged the finger print is no.

Uses

The utmost power of use area is in the hands of control for their systems. That are especially important for laptops and PDAs. Thanks to the price falling, more and more devices are developed with sensors. Different gadgets with worked in unique mark sensors incorporate USB hard drives, USB memory modules and card perusers. They are additionally accessible in mice and consoles.

Sensors are progressively used to get monetary exchanges and change machines for "online" banking. In the future, the proprietor's finger impression will be store dsecurely on personality cards and Visas and may likewise be utilized for verification of messages utilizing computerized marks. Direct physical access to rooms and devices can also be ensured by coupling fingerprint sensors with door opening systems.

3.11 BUZZER

The beep rise sound hearing device, which may be mechanical, electro mechanical, or piezoelectric (*piezo* for short). Typical uses of sounds and beepers may also include alarm devices, timers, and combine in the of user input such as a mouse click or keystroke.



Fig 3.11:BUZZER

TYPES

Electro mechanical Early devices were based on an electromechanical system identical to an electric bell without hammer along. Similarly, a relay may be connected to interrupt its own,

Mechanical

A joy buzzer is an example of a purely mechanical buzzer and they require drivers. Other examples of them are doorbells.



Fig.3.11.1

Piezoelectric

A piezo electric element might be driven by an oscillating electronic circuit or other sound signal source, driven with a piezoelectric sound intensifier. Sounds generally used to demonstrate that a catch has been squeezed are a tick, a ring or a signal.

A piezoelectric signal/beeper additionally relies upon acoustic hole reverberation or Helmholtz resonance to produce an audible beep.

APPLICATIONS

While technological advancements have caused buzzers to be impractical and undesirable, there are still instances in which buzzers and similar circuits may be used. Present day applications include:

- Noveltyuses
- Judgingpanels
- Educational purposes
- Annunciatorpanels
- Electronicmetronomes
- Game showlock-outdevice
- Microwave ovensandotherhouseholdappliances
- Sportingevents such asbasketballgames
- Electrical alarms
- Joy buzzer(mechanical buzzer used forpranks)

3.12 Simple Piezo Buzzer circuit diagram

Piezo buzzers are one of the most common buzzers available around, they got their name from the piezoelectric material used as the active element.

These buzzers are usually driven at a relatively higher voltage but low current, consumes a little power, but still capable of producing very high sound.

The Piezo element must be a three terminal one, like in the picture.



Fig.3.12

The blue wire is connected to feedback(F) terminal, red wire to the main (M) terminal and the black wire to the piezo element's ground(G) plate.

3.12.1 Circuit diagram and construction

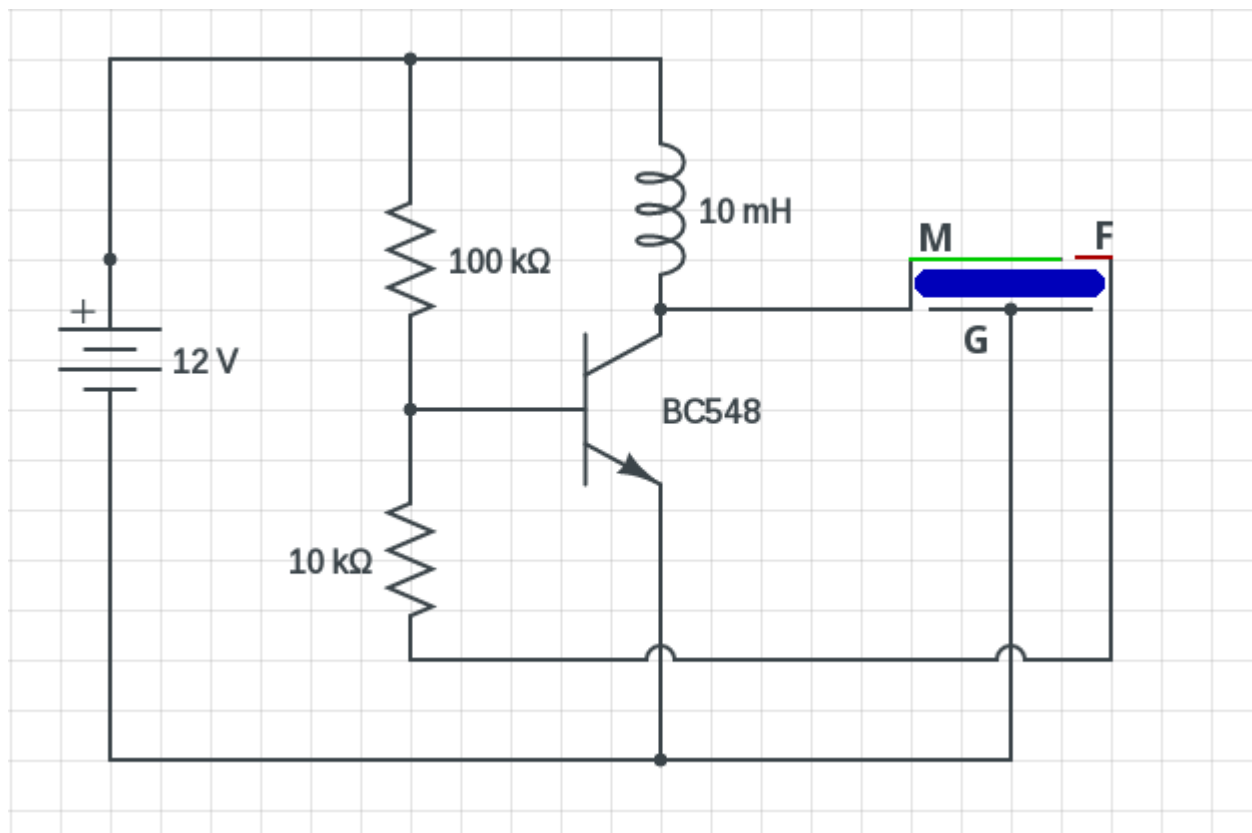


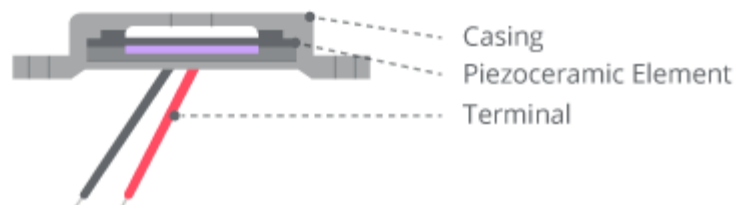
Fig 3.12.1

Piezo Buzzer Characteristics

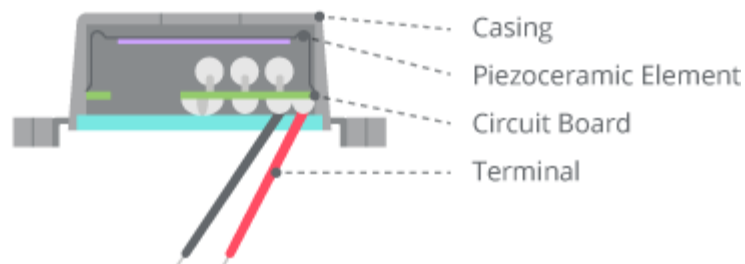
- Wide operating voltage: 3~250V
- Lower current consumption: less than 30 mA higher rated frequency
- Larger footprint
- Higher sound pressure level

STRUCTURE OF PIEZO BUZZER

Transducer *(without driving circuitry)*



Indicator *(with driving circuitry)*



There are two types of piezo buzzers - transducers and indicators. Transducers consist of a casing, a piezo ceramic element and a terminal. In order to operate a transducer, the user must send a square wave signal to the buzzer. Indicators consist of a casing, a piezoceramic element, a circuit board and a terminal. In order to operate an indicator, the user must send the buzzer a specified dc voltage.

3.12.2 L293D MOTORDRIVER

The driver is a two port H-connect engine driver combined circuit (IC). Engine drivers will do about the fast enhancers since they take a low-ebb and flow control flag and give a higher-flow signal. The big signal and flow signal will be used as to drive the motors. L293D contains two in built H-connect driver circuits. In its basic method of operation, two DC motors can be driven simultaneously, both in forward and reverse bearing.

PIN DIAGRAM:

Simple DC equipment head engines want contemporary above 250mA. There are many integrated circuits like ATmega16 Microcontroller, 555 clock IC. Be that because it may, IC seventy four association cant deliver this degree of contemporary. At the factor while the engine is straightforwardly related to the o/p of the above ICs at that factor, they will harm. To beat this issue, an engine manipulate circuit is required, that could cross approximately as a scaffold between the above engines and ICs (integrated circuits). There are unique methods of creating H-join engine manipulate circuit like utilising semiconductor, transfers and utilising L293D/L298

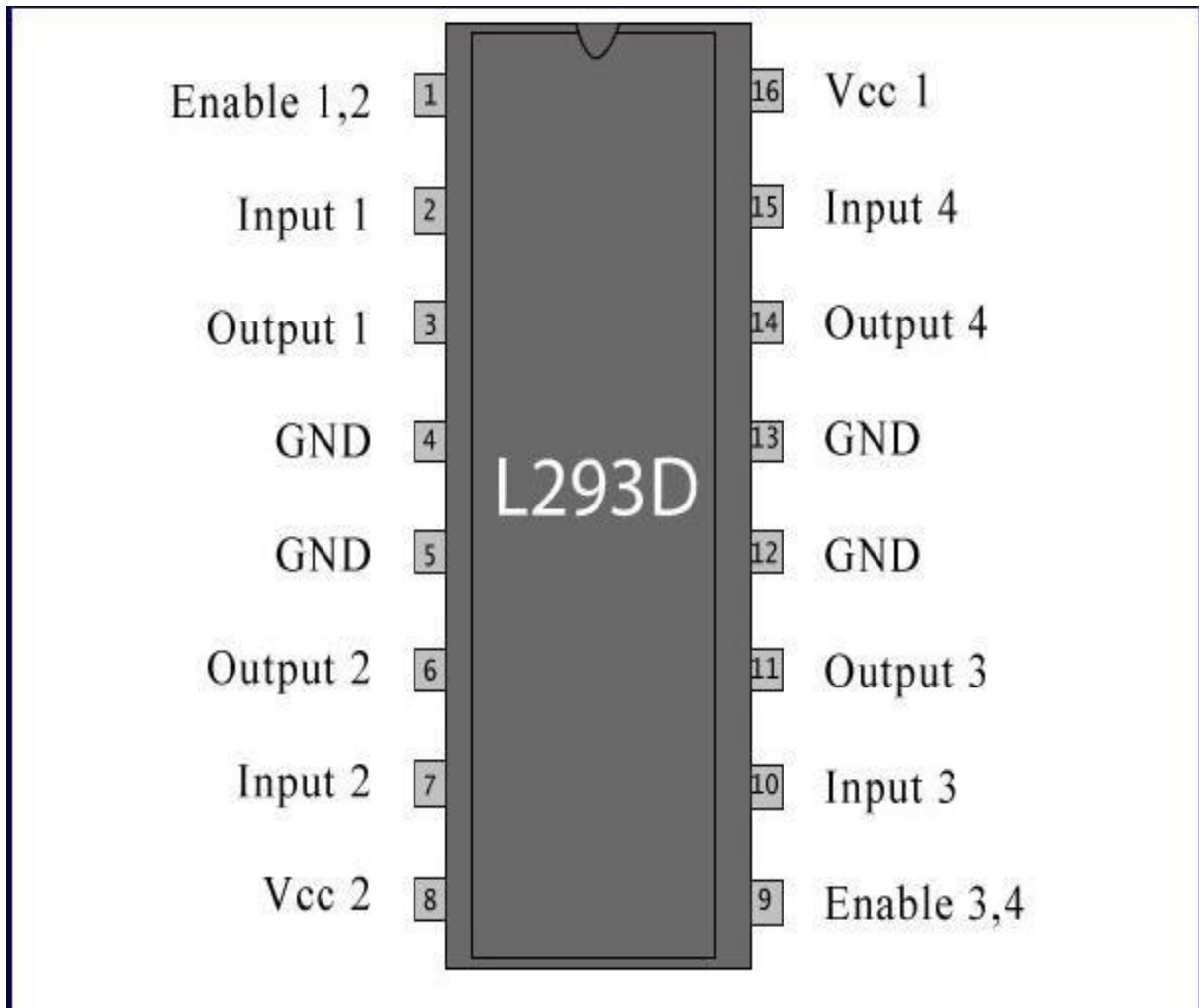
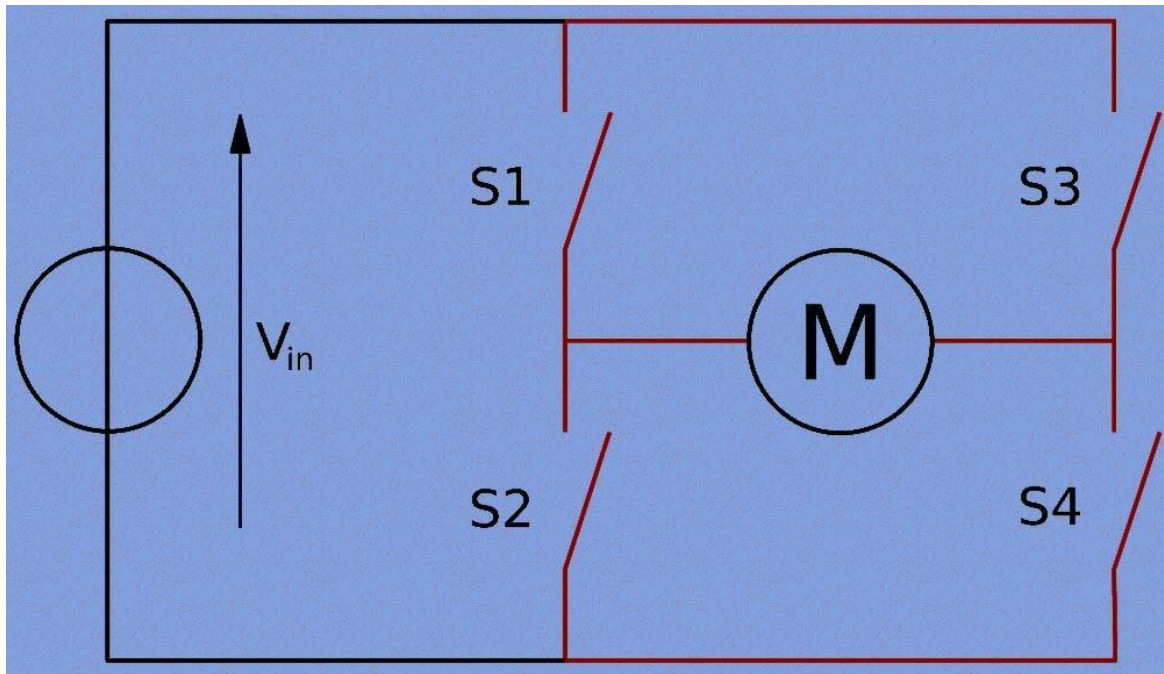


Fig 3.12.2

H-Bridge Circuit

A H connect is an electronic circuit that permits a voltage to be applied across a heap toward any path. H-connect circuits are often utilized in advanced mechanics and numerous different applications to permit DC engines to run forward and in reverse. These engine control circuits are for the most part utilized in various converters like DC-DC, DC-AC, AC-AC converters and numerous different sorts of force electronic converters. In explicit, a bipolar stepper engine is constantly determined by an engine regulator having two H-spans



Ok bridge is fabricated with four switches like S1, S2, S3 and S4. When the S1 and S4 switches are shut, at that point a +ve voltage will be applied across the engine. By opening the switches S1 and S4 and shutting the switches S2 and S3, this voltage is modified, permitting upset activity of the engine.

3.13 L293D MOTOR DRIVER:



Fig 3.13

L293D Motor Driver IC

L293D IC is a common Engine Driver IC which permits the DC motor to drive on any bearing. This IC comprises of 16-pins which are utilized to control a bunch of two DC engines immediately toward any path. That is to say, by utilizing a L293D IC we can handle two DC engines. Also, this IC can drive little and calm enormous engines.

This L293D IC deals with the essential rule of H-connect, this engine control circuit allows the voltage to be flowing in any direction. As we know that the voltage must be alter the course of having the option to pivot the DC engine in both the ways. Consequently, H-connect circuit utilizing L293D ICs are ideal for driving an engine. Single L293D IC comprises of two H-connect circuits inside which can pivot two DC engines independently. By and large, these circuits are utilized in mechanical technology because of its size for controlling DC engines.

3.14 SOFTWARE REQUIREMENTS DETAILS

3.14.1 ARDUINO IDE

Arduino is an open-source degree applied for constructing hardware projects. Arduino comprises of each an real programmable circuit board (often alluded to as a microcontroller) and a chunk of programming, or IDE (Integrated Development Environment) that unexpected spikes in call for on your PC, used to compose and transfer PC code to the physical board.

The Arduino degree has gotten very main stream with people genuinely starting with gadgets, and in mild of present day circumstances. Dis similar to maximum past programmable circuit sheets, the Arduino need trouble with a distinct piece of gadget (referred to as a software program engineer) to stack new code onto the board – you could simply make use of a USB link. Also, the Arduino IDE makes use of as implified version of C++, making it easier to parent out a way to program. At last, Arduino offers a popular shape element that breaks out the factors of the miniature regulator right into aextra get right of entry to ible bundle.

The Arduino gadget and programming turned into supposed for specialists, originators, specialists, programmers, beginners, and every personeager on establishing smart gadgets or conditions. Arduino can collaborate with catches, LEDs, engines, speakers, GPS units, cameras, the web, and extraordinarily your PDA or your television! This adaptability joined with the manner that the Arduino programming is loose instructions for ae normous collection of Arduino-based ventures The rearese vera assortments of Arduino sheets (explained on the next page) that may be applied for diverse purposes. A few sheets appear an fairly now no longer pretty similar to the only underneath, but maximum Arduinos have maximum of those elements in common:

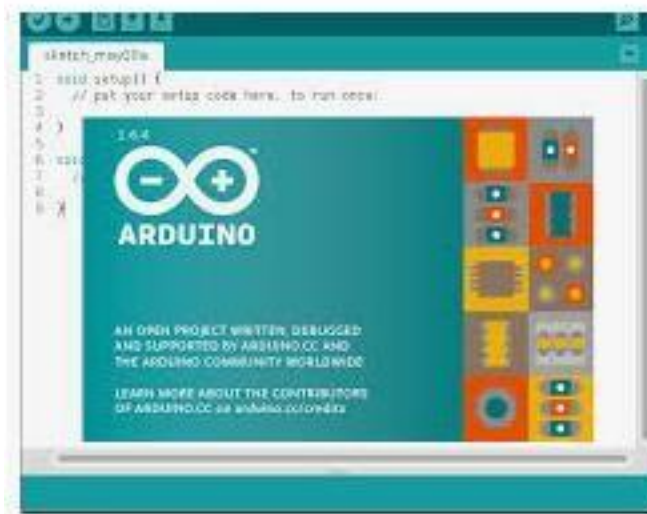


Fig.3.14.1

Projects composed utilising Arduino Software(IDE) are referred to as sketches. These portrayals are written within the pre-processor and are stored with the file extension .ino. The manager has highlights for cutting/gluing and for looking/supplanting textual content. The message place offers complaint while saving and buying and selling and more over suggests blunders. The reassurance suggests textual content yield through the Arduino Programming (IDE), inclusive of general mistake messages and different data. The base right hand nook of the window suggests the organized board and serial port.

The Arduino IDE is unfathomably moderate, but it offers a close generalweather to maximum Arduino-primarily based totally tasks. The pinnacle menu bar has the standard alternatives, inclusive of "Record" (new, load save, and so on), "Alter" (textual content style, duplicate, glue, and so forth), "Sketch" (for aggregating and programming), "Devices" (preciouspicks for checking out activities), and "Help". The center section of the IDE is a truthful phrase processor that where in you may enter this system code.

Tasks made utilising the Arduino are referred to as portrays, and such attracts are usually written in a chopped down shape of C++ (diverse C++ highlights are excluded). Since programming a microcontroller is to a now no longer similar to programming a PC.

The Arduino IDE upholds the dialects C and C++ using unique standards of code organizing. The Arduino IDE supplies a product library from the Wiring project, which gives numerous normal information and yield strategies. Client composed code just requires two essential capacities, for beginning the sketch and the primary program loop, that are incorporated and connected with a program stub fundamental() into an executable cyclic leader program with the GNU instrument chain, likewise included with the IDE circulation. The Arduino IDE utilizes the program override to change over the executable code into a textfile in hexadecimal encoding that is stacked into the Arduino board by a loader program in the board's firm product.

3.14.2 EMBEDDED C:

The embedded C is most famous coding in hardware language in programming field for creating electronic devices. Every device utilized by this digital framework will be related with installed programming.

Installed C code will look assumes a vital part by showing explicit capacity by the processor. In day-to-day life, we use many electronic devices such as mobile phone, clothes washer, computerized camera, and so on. These all gadget working depends on microcontroller that are customized by inserted C.

The inserted embedded C code will be written by upper block outline is utilized for flickering the Drove associated by the input port 1 of microcontroller. In installed framework coding done by C code is liked over other language. Because of the accompanying reasons:

- simple to understand
- Complex Unwavering quality
- Easy to handle
- More due time.

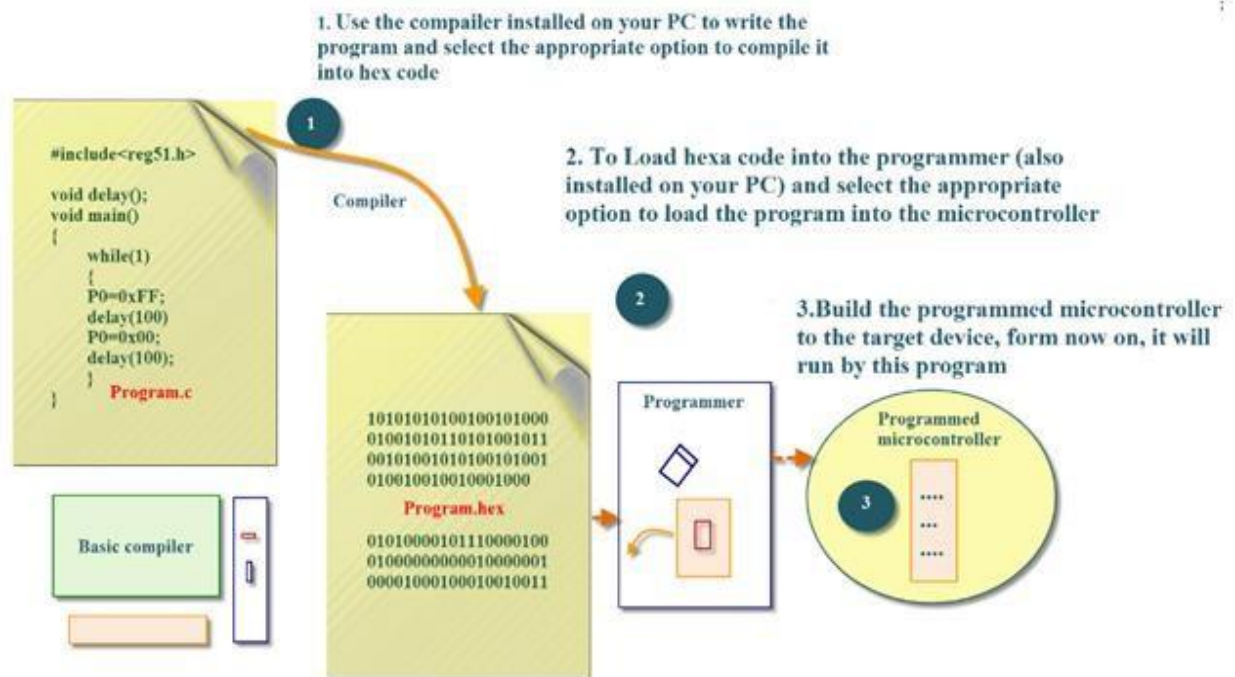


Fig 3.14.2

The software is highly dependent on the CPU and specific chips chosen. Most embedded software engineers have at least a passing knowledge of reading schematics, and reading data.

A Keyword is a special word with a special meaning to the compiler (a C Compiler for example, is a software that is used to convert program written in C to Machine Code).Forexample,ifwetaketheKeil'sCx51Compiler(apopularCCompilerfor 8051 based Microcontrollers) the following are some of thekeywords:

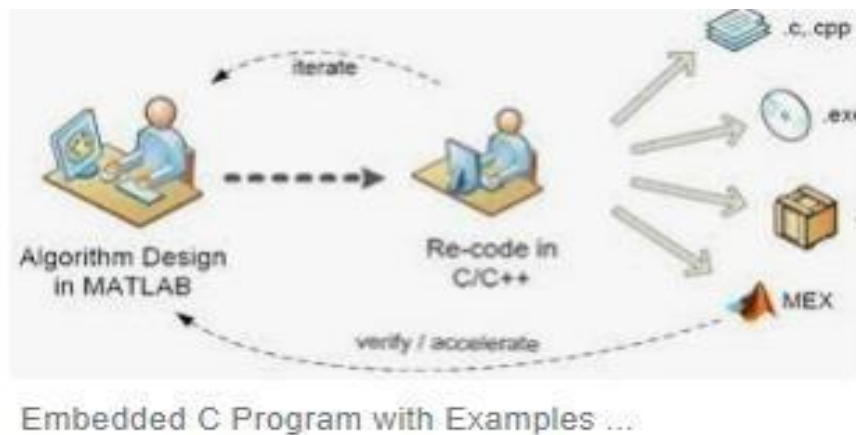


Fig.3.14.3

- bit
- sbit
- sfr
- small
- large

These are few of the many keywords associated with the Cx51 C Compiler along with the standard C Keywords.

CHAPTER 4

CONCLUSION

So, in our country, number of common people had gone their life by the road accidents, because of non formal or no response for communication. I, think by an automatic vehicle accident and theft detection device can be implemented and can help. By using this system we can reduce death due to accidents and we can take immediate action after the accident. Also, it is used in the theft detection. A fingerprint recognition system, eye blink sensing system is used in this project. GSM module can also be needful for saying information to that by the vehicle theft to the owner. GPS system can be used to track the vehicle within the specified area by that of the owner. This device can be used in implementing and to track and monitor the system by the owner by mean time or anytime from anywhere. Thus, the protocol that has been present in this project provide more safety and dependability to the vehicle. The need of this proposed methodology has more efficient in achieving a great and useful vehicle security system. This supply of demand for particular device systems for protecting the vehicle from the land prevention is increasing day by day. By this proposed system will be a scholarly framework to fulfill this need.

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