
VISVESVARAYA TECHNOLOGICAL UNIVERSITY



MINI PROJECT REPORT ON

“BREATHALYZER”

SUBMITTED BY:

N.HARINATH REDDY (1NH18EC733)

Under the guidance of

Dr.K.C.R. NISHA

Professor, Dept. of ECE, NHCE, Bengaluru.



NEW HORIZON COLLEGE OF ENGINEERING

(ISO-9001:2000 certified, Accredited by NAAC ‘A’, Autonomous
college permanently affiliated to VTU) Outer Ring Road, Panathur Post,
Near Marathalli, Bengaluru-560103

CHAPTER 01

INTRODUCTION

Breathalyzer is a general term used for devices finding the blood alcohol content present in the human blood i.e. using this device we can sense the amount of alcohol a person consumed from his breathe. Breathalyzer is very useful when we consider several cases of accidents caused by drunk driving, by using this device, we can warn the driver of a car when he/she is too drunk to drive a car. Here we will be using the MQ-135 sensor. MQ 135 is a semiconductor which is very cheap and which has the ability to detect the alcohol content in human body at the values between 0.05 mg/L to 10 mg/L. The sensor utilizes a chemical response to decide liquor level and the essential detecting component in the sensor is SnO₂, the conductivity of SnO₂ is low in clean air yet increments as the concentration of alcohol gas in air (breathe) increments. It has high affectability to liquor and has a decent protection from aggravations and commotion from things like smoke and fuel.

The main components involved in this project are: Arduino UNO Board, MQ-135 Sensor, bread boards, 16*2 LCD Display, jumper wires, 5v battery. As air moves in and out through similar arrangement of respiratory cylinders, constant blending of breathed in and breathed out air happens. Air moves from the nose/mouth to the windpipe to two cylinders (one for every lung), known as the bronchi. The bronchi separate into a few developments, which end in an enormous number of tubules. Toward the finish of the tubules are the alveoli, and an individual's lung contains million of alveoli. Encompassing the alveoli is a fine organization of narrow veins. At this level the blood trades synthetics with the air in the lungs. Studies show that the liquor focus in the lower bit of the lungs is proportionate to the grouping of liquor in the blood at a proportion of 2100:1.

In late 1927, for a situation in Marlborough, England, Dr. Gorsky, a Police Surgeon, requested that a suspect blow up a football bladder with his breath. As more than 1 liter of the man's breath contained 1.5 mg of ethanol, Dr. Gorsky affirmed under the steady gaze of the court that the litigant was "half-drunk"..

CHAPTER 02

LITERATURE SURVEY

Title of the paper	Author & year of publication	outcome	Limitation
Drunken system Technique	Prashanth K /2014	Operates based on BAC level	not accurate
Drunken driver detection and alarm system	Kishen padiyar /2018	Triggers GPS module	Network issues may occur
Alcohol detection in real time	Naveen kumar /2019	MQ-3 sensor will detect breath alcohol content	When installed in car, it might not detect, when engine is running while car is in halt state and driver is drunk.

Table 2.1 Literature Survey

CHAPTER 03

EXISTING SYSTEM AND PROBLEM STATEMENT

EXISTING SYSTEM:

There are various advanced vehicles systems installed in the vehicles which can monitor the performance and speed of the vehicles

- Existing advanced systems like anti-lock braking system immobilizers
- There are very bulky and big size, difficult to fabricate
- Alcohol detention techniques used presently like skin sensors, handled sensors are contact based or need subject's participation

PROBLEM STATEMENT:

To design a circuit that detects alcohol content in blood.

OBJECTIVES:

- To trace the presence of alcohol in blood from breath.
- To convert the analog output of the sensor into digital code.
- To program the Arduino to take inputs from ADC and perform appropriate operations to give an output.
- To program the Arduino to drive the output using the seven segment display.
- Implementation of the circuit

CHAPTER 04

PROJECT DESCRIPTION

In this project we are going to write a code for sensing the alcohol content (breathalyzer), which will be dumped into Arduino, the main purpose of doing this project is to reduce the accidents caused because of alcohol consumption. For achieving this First we have to code, before writing code we should know the condition i.e. for which we are writing code. Here we are using a sensor named MQ-3 Sensor which sends the analog signal based on which we'll find whether the person is drunk or not. So we'll take a standard value into consideration and based on that standard value we will decide whether the person is drunk or not. So we can write the code simply on the basis of if loop.

4.1 BLOCK DIAGRAM:

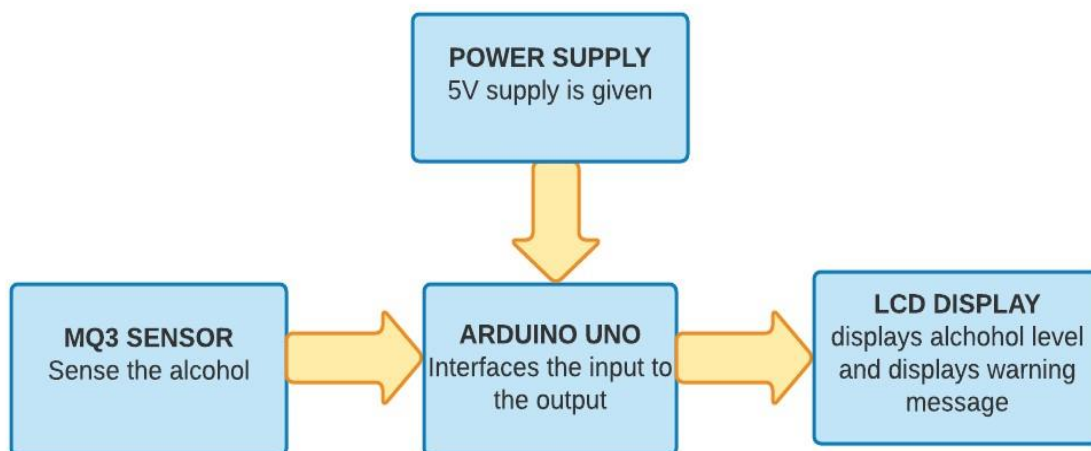


Fig 4.1.1 BLOCK DIAGRAM

4.2 HARDWARE COMPONENTS:

	COMPONENTS	QUANTITY
1	Solderless Breadboard	2
2	Arduino Uno	1
3	MQ-3 Sensor	1
4	16×2 LCD Display	1
5	L.E.D	1
6	Male to Male Jumper Wires, Male to Fe-Male Jumper Wires	
7	Battery 5v	1

Table 4.2.1: HARDWARE COMPONENTS

4.3 SOLDERLESS BREAD BOARD:

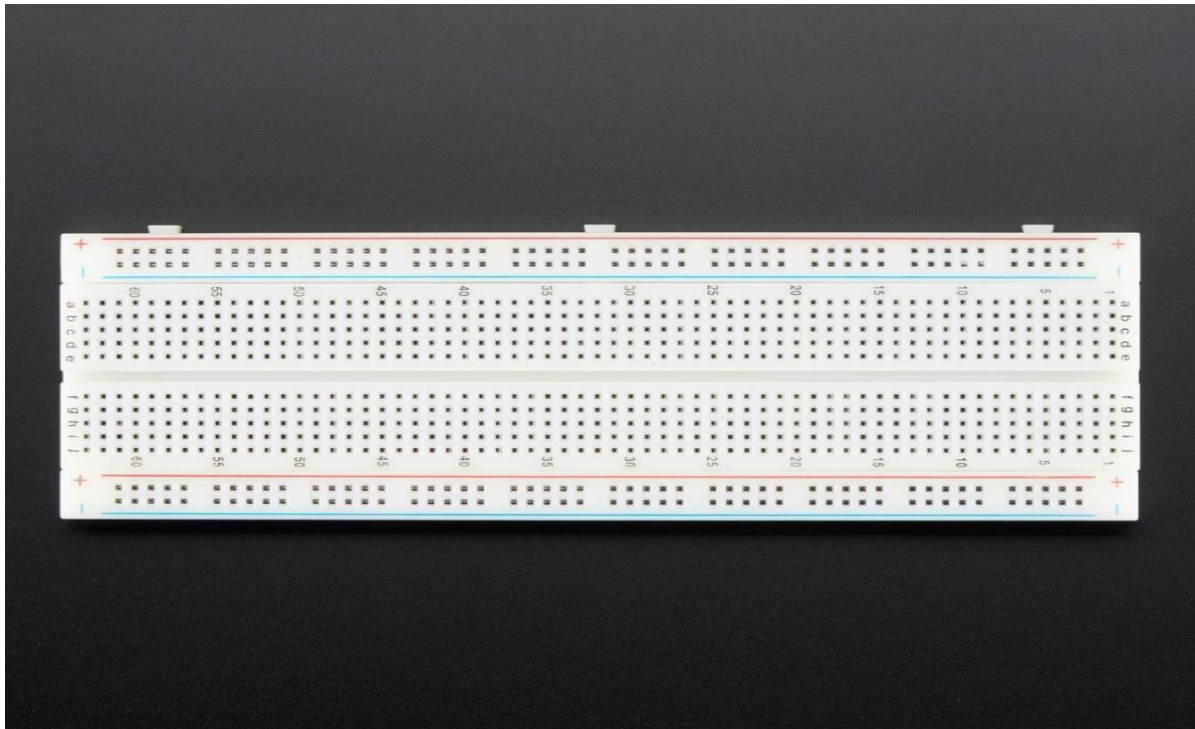


Fig 4.3.1: Bread Board

This is a 'full-size' breadboard, 830 tie focuses. Useful for little and medium activities. It is 2.2" x 7" (5.5 cm x 17 cm) with a standard twofold strip in the center and two force rails on the two sides. You can pull the force rails off effectively to make the breadboard as slim as 1.4" (3.5cm). You can likewise "snap" these breadboards together whichever way to make longer or potentially more extensive breadboards. The back is made of froth twofold sided tape, in the event that you eliminate the defensive paper you can append it to a level clean surface. Since the solderless breadboard doesn't need fastening, it is reusable. This makes it simple to use for making transitory models and exploring different avenues regarding circuit plan.

Thus, solderless breadboards are likewise famous with understudies and in mechanical schooling.

More seasoned breadboard types didn't have this property. A stripboard and comparable prototyping printed circuit sheets, which are utilized to construct semi-lasting welded models or unique cases, can only with significant effort be reused. An assortment of electronic frameworks might be prototyped by utilizing breadboards, from little simple and computerized circuits to finish focal preparing units (CPUs).

Why Use Breadboards?

A hardware breadboard is really alluding to a solderless breadboard. These are incredible units for making impermanent circuits and prototyping, and they require positively no welding. Prototyping is the way toward testing out a thought by making a fundamental model from which different structures are created or replicated, and it is perhaps the most well-known utilizations for breadboards. On the off chance that you don't know how a circuit will respond under a given arrangement of boundaries, it's ideal to assemble a model and test it out.

For those new to gadgets and circuits, breadboards are regularly the best spot to begin. That is the genuine magnificence of breadboards- - they can house both the least difficult circuit just as exceptionally complex circuits. As you'll see later in this instructional exercise, if your circuit grows out of its present breadboard, others can be appended to oblige circuits, all things considered, and complexities. Another normal utilization of breadboards is trying out new parts, for example, Integrated circuits (ICs). At the point when you are attempting to sort out how a section functions and continually revamping things, you would prefer not to need to patch your associations each time. As referenced, you don't generally need the circuit you work to be perpetual. When attempting to copy a client's concern, Spark fun Technical Support group will frequently utilize breadboards to fabricate, test, and examine the circuit. They can associate the parts the client has, and whenever they've gotten the circuit arrangement and sorted out the issue, they can dismantle everything and set it aside for whenever they need to do some investigating.

The highest points of the metal columns have little clasps that cover up under the plastic openings. Each metal strip and attachment is dispersed with a standard pitch of 0.1" (2.54mm).

These clasps permit you to stick a wire or the leg of a segment into the uncovered openings on a breadboard, which at that point hold it set up.

When embedded that part will be electrically associated with whatever else set in that column. This is on the grounds that the metal columns are conductive and permit current to move from any point in that strip. Notice that there are just five clasps on this strip. This is normal on practically all breadboards. Consequently, you can just have up to five segments associated in one specific segment of the breadboard. The line has ten openings, so for what reason can you just interface five segments? You'll additionally see that every level column is isolated by a gorge, or precipice, in the breadboard. This gorge disengages the two sides of a given line from each other, and they are not electrically associated. We'll talk about the motivation behind this in a tad, yet, for the time being, simply realize that each side of a given column is detached from the other, leaving you with five spots for parts on one or the other side.

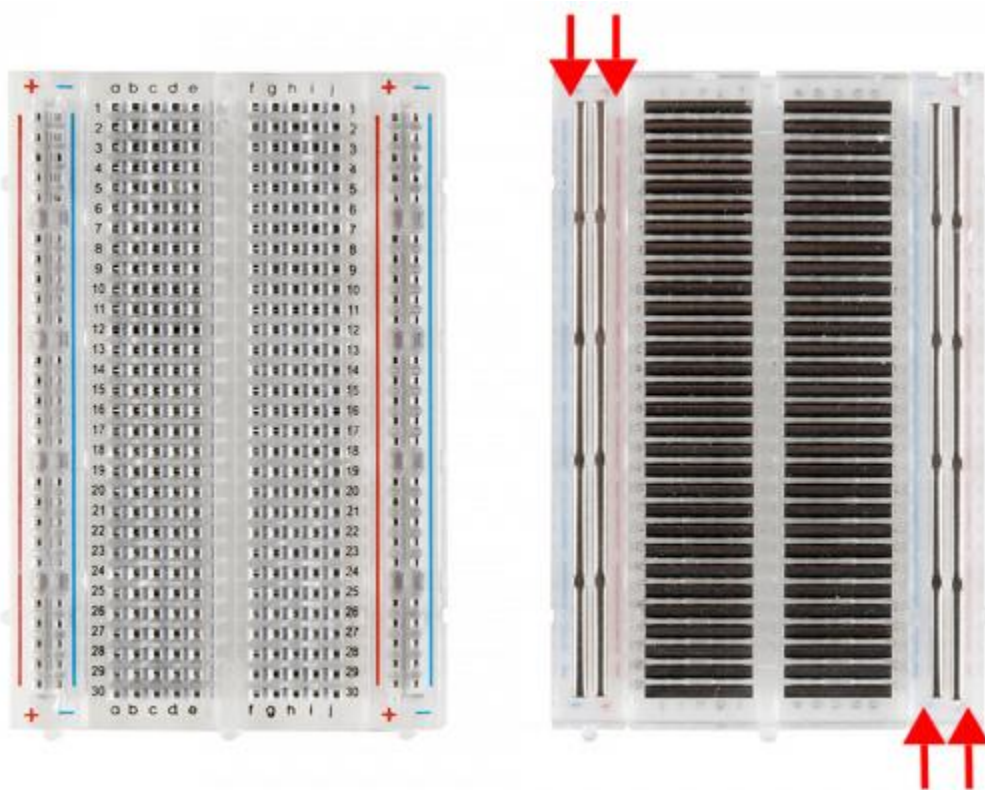


Fig 4.3.2: INTERNAL STRUCTURE OF POWER RAILS IN BREAD BOARD

4.4 ARDUINO UNO:



Fig 4.4.1: ARDUINO UNO

"Uno" signifies "one" in Italian and was picked to stamp the underlying arrival of Arduino programming. The Uno board is the first in a progression of USB-based Arduino sheets; it and form 1.0 of the Arduino IDE were the reference variants of Arduino, which have now advanced to fresher deliveries. The ATmega328 on the board comes pre-customized with a bootloader that permits transferring new code to it without the utilization of an outside equipment software engineer. While the Uno conveys utilizing the first STK500 convention, it contrasts from all previous sheets in that it doesn't utilize the FTDI USB-to-chronic driver chip. All things being equal, it utilizes the Atmega16U2 (Atmega8U2 up to variant R2) customized as a USB to chronic converter.

Technical specifications:

Microcontroller	ATmega328P
Operating Volt.	5V
Input Volt. (recommended)	7-12V
Input Volt. (limit)	6-20V
Digital I/O Pins	14 (6 PWM output)
PWM Digital I/O Pins	6
Analog Input Pins	6
DC Current per I/O Pin	20 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328P) of which 0.5 KB used by bootloader
SRAM	2 KB (ATmega328P)
EEPROM	1 KB (ATmega328P)
Clock Speed	16 MHz
LED_BUILTIN	13
Length	68.6 mm
Width	53.4 mm

Table 4.4.1: SPECIFICATIONS OF ARDUINO UNO

Communication:

The Arduino Uno has various offices for speaking with a PC, another Arduino board, or other microcontrollers. Nonetheless, on Windows record is required. Arduino Software (IDE) incorporates a chronic screen which permits straightforward literary information to be shipped off and from the board. The RX and TX LEDs on the board will streak when information is being sent through the USB-to sequential chip and USB association with the PC (however not for sequential correspondence on pins 0 and 1). A Software Serial library permits sequential correspondence on any of the Uno's computerized pins.

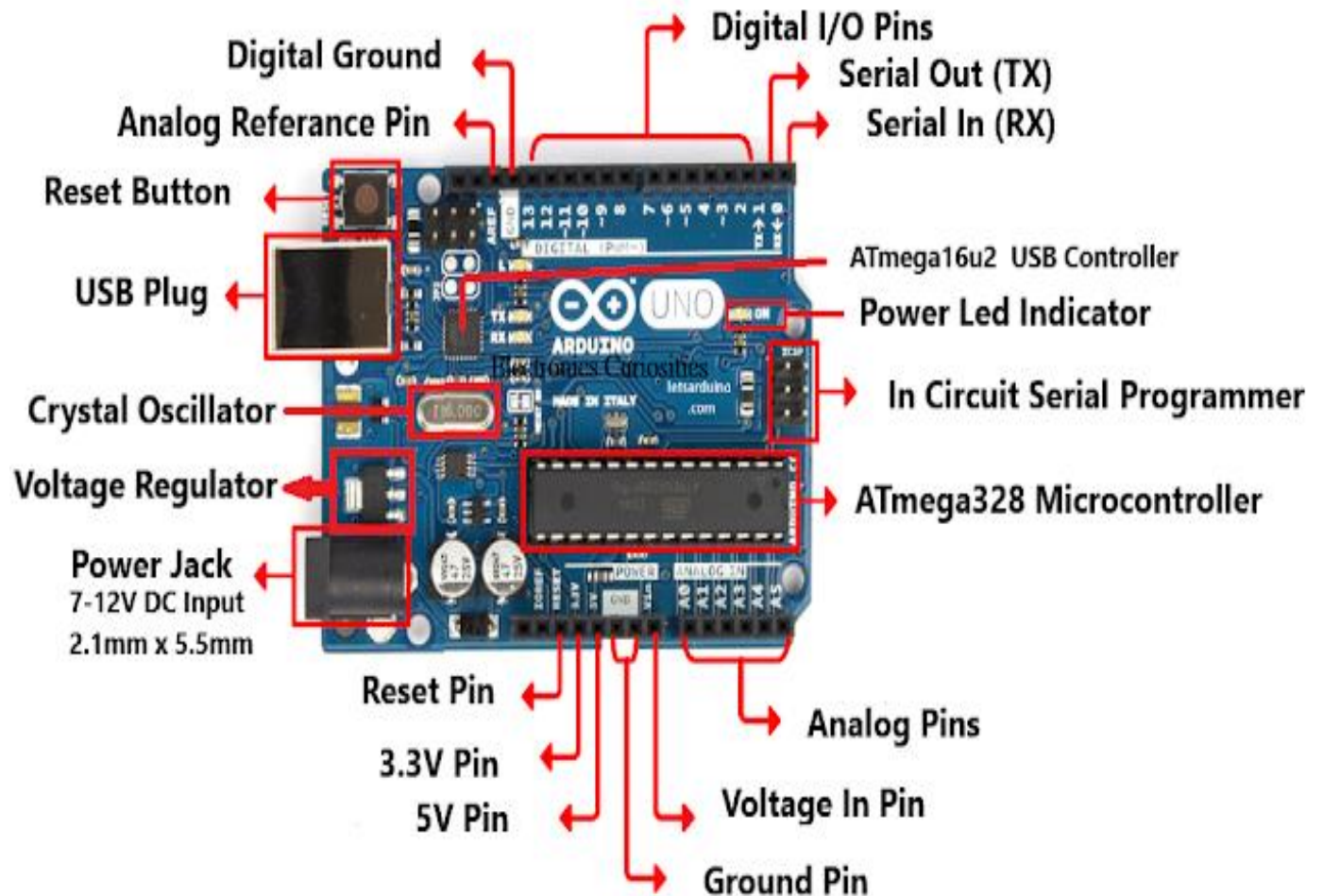


Fig 4.4.2: PIN DESCRIPTION OF ARDUINO UNO

Difference between Arduino UNO and NANO:

- Both Arduino UNO and Arduino NANO come with similar functionality with a little difference in terms of PCB layout, size and form factor.
- Arduino UNO is a microcontroller board based on at mega 328 and has 14 digital pins out of which 6 are PWM pins. It has 6 analog pins interfaced on the board. No extra peripheral is required. It is a complete ready to use that requires no prior technical skills to get on hands-on experience. Arduino UNO can be powered by using DC power jack, battery or simple plug to the computer using USB cable.

- Arduino Nano is small and compact when compared to Arduino UNO. It doesn't have DC power jack and comes with Mini USB instead of regular USB. Nano has 2 extra analog pins than UNO. Nano is breadboard friendly whereas UNO lacks this nature. However, both devices run at 5V, 40 mA and 16MHz frequency.

Name	Arduino Nano	Arduino Uno
MCU	Atmega328p/Atmega 168.	Atmega328p
Power	5V	5V
Input Voltage	7 -12 V	7 – 12 V
Maximum Current Rating	40mA	40mA
Clock Frequency	16MHz	16MHz
Flash Memory	16KB/32KB	32KB
USB	Mini	Standard
USART	Yes	Yes
SRAM	1KB/2KB	2KB
PWM	6 out of 14 digital pins	6 out of 14 digital pins
GPIO	14	14
Analog Pins	8	6
EEPROM	512bytes/1KB	1KB

Difference between Arduino Uno and Arduino Nano

Fig 4.4.3: DIFFERENCE BETWEEN ARDUINO UNO AND ARDUINO NANO

Arduino Architecture

Essentially, the processor of the Arduino board utilizes the Harvard engineering where the program code and program information have separate memory. It comprises of two recollections, for example, program memory and information memory. Wherein the information is put away in information memory and the code is put away in the blaze program memory. The Atmega328 microcontroller has 32kb of glimmer memory, 2kb of SRAM 1kb of EPROM and works with a 16MHz clock speed. It's an electronic gadget its utilized for seeming well and good and

control more actual world then the work stations and ARDUINO is open source electronic prototyping Platform dependent on a basic microcontroller board we can build up the climate for composing programming for the board to permitting make intelligent electronic gadget.

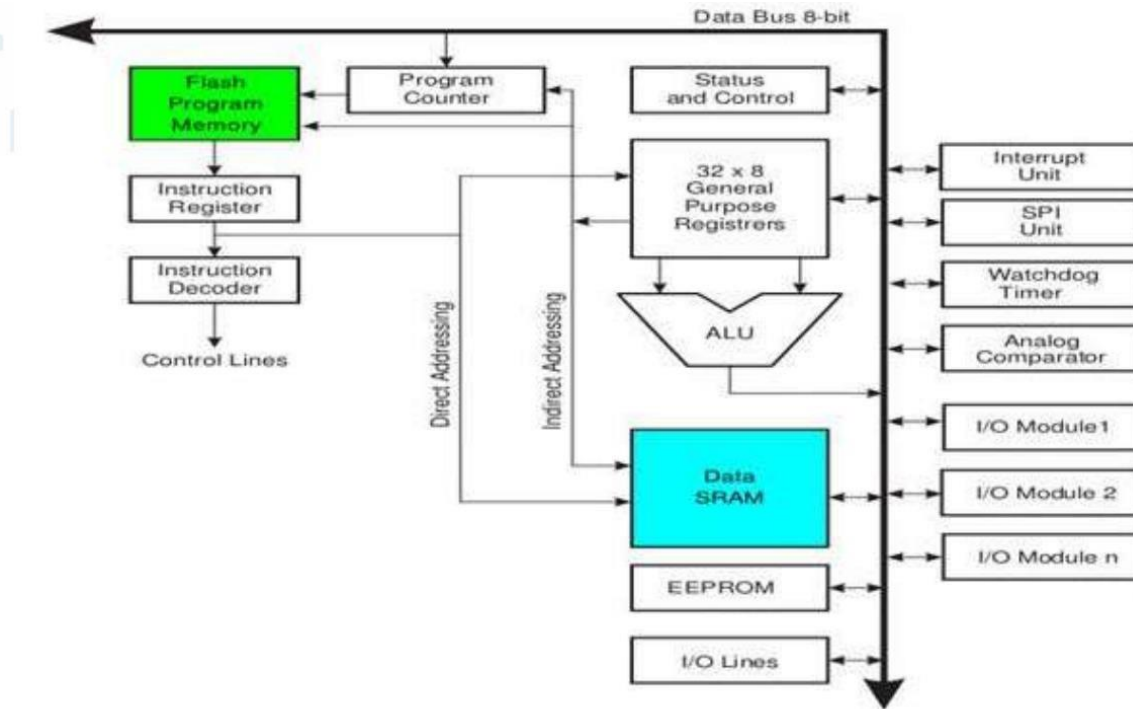


Fig.4.4.4: Arduino Architecture

ARDUINO can be utilized to create intelligent articles, taking contributions from a verity of switcher or sensor and controlling an assortment of lights, engines and other actual yield, ARDUINO they can speak with programming running your PC .The ARDUINO programming language is an execution of wiring a comparable actual registering stage .which depends on the preparing interactive media programming climate .For programming the microcontrollers ARDUINO stage give an incorporated improvement climate (IDE) in view of the handling venture .it incorporates uphold for c and C++ programming dialects.

4.5 MQ-135 SENSOR:

The sensors requires some amount of preheating which is around 5minutes before the first use. The sensors takes a little time to retrace back to normal condition after one positive test. During the detention if there is no alcohol content then the sensors take a very less time to swing back to its original condition. Using approximation techniques, we can arrive at the logic of converting ADC to BAC percentage is obtained it has high sensitivity towards alcohol has a very good resistive against the smoke and gasoline. The most sensitive material with which the sensor is made is tin oxide. The conductivity of the sensor goes very high once the alcohol is detected. Once the alcohol concentration is detected it give analog resistive output. A resistance is present across A and B pin in the configuration. Alcohol content is directly proportional to the resistance. A voltage resistance is formed due to voltage divider. Once the sensor resistance is low the voltage readings goes high.

SPECIFICATIONS OF MQ-135 SENSOR:

- Required power is 5Vdc which is approximately = ~60mA when the heater is off or / ~165mA when the heater is on .
- The amount of consumption of current is about 150mA.
- Dout output pin has a transistor logic varying from 0 to 1.
- Aout output pin has values 0.1 to 0.3v and the maximum voltage is about 4v.
- Alcohol detecting concentration is 0.05 to 10mg/L.
- The sensing range of alcohol is 2K ohms to 20K ohms

FEATURES OF MQ-135 SENSOR:

- The sensor has a really long life and the cost of the sensor is low • The sensitivity of the sensor is very high and its response rate is also good.

- The stand-by mode consumes less power.
- The sensor is a semiconductor device.
- The sensor is compatible with most of the microcontroller.



Fig 4.5.1 MQ-135 SENSOR

4.6 16*2 LCD DISPLAY:

16*2 LCD means it has 16 columns and 2 rows. Thus, in total it has 32 characters in total and each character is made with 5*8-pixel dots. Therefore 16*2 Lcd has of 1280 pixels. In order to handle all these pixels, this LCD display is interfaced with some sort of IC's to control the functionality. Here in our circuit, it is interfaced with I2C module.



Fig 4.6.1: L.C.D display

FEATURES:

- Operating voltage of 4.7V -5.3v
- Current consumption is 1mA without backlight
- Alphanumeric LCD display module means can display both alphabets and numbers.
- Consists of 2 rows
- It is used to either read or write the data.

PIN DISCRIPTION OF LCD:

RS pin will control the memory of LCD when writing data, The data register which holds which is on the screen, or an instruction register which has LCD's controller looks for instruction on what is next either of them can be selected.

R/W pin can be used for writing or reading mode.

Enable pin enables the writing mode to the register.

8 data pins these states have pins of high or low and the bits that are writing the register when you write or the values which are read for reading.

4.7 How L.E.D Works:

The **LED** glow only when it has -LED and + LED pins are used for glowing the LED. The controls the display contrast and off the LED backlight.

The process of displaying the content involves putting the data which forms the picture of the data register, the instruction is the instruction register. The liquid crystal library makes it simple for you so that we know the low-level instructions.

L.E.D:

In the easiest terms, L.E.D is a semiconductor gadget that produces light when an electric flow is gone through it. Light is created when the particles that convey the current consolidate together inside the semiconductor material. Since light is produced inside the strong semiconductor material, LEDs are portrayed as strong state gadgets.

The term strong state lighting, which likewise envelops natural LEDs (OLEDs), recognizes this lighting innovation from different sources that utilization warmed fibers. Inside the semiconductor material of the LED, the electrons and openings are contained inside energy groups. The partition of the groups (for example the bandgap) decides the energy of the photons (light particles) that are transmitted by the LED.

The photon energy decides the frequency of the transmitted light, and consequently its tone. Diverse semiconductor materials with various bandgaps produce various shades of light. The

exact frequency (shading) can be tuned by modifying the synthesis of the light-producing, or dynamic, locale.

LEDs are included in compound semiconductor materials, which are comprised of components from bunch III and gathering V of the intermittent Until the mid-90s LEDs had a restricted scope of tones, and specifically business blue and white LEDs didn't exist.

An electron opening exists where a particle needs electrons (contrarily charged) and along these lines has a positive charge. Semiconductor materials like germanium or silicon can be "doped" to make and control the quantity of electron openings. Doping is the adding of different components to the semiconductor material to change its properties. By doping a semiconductor you can make two separate sorts of semiconductors in a similar precious stone. The limit between the two sorts is known as a p-n intersection. The intersection just permits current to go through it one way, this is the reason they are utilized as diodes.

LEDs are made utilizing p-n intersections. As electrons go through one precious stone to the next they fill electron openings. They discharge photons (light).



Fig4.7.1: L.E.D

4.8 History of Breathalyzer:

A 1927 paper delivered by Emil Bogen,[3] who gathered air in a football bladder and afterward tried this air for hints of liquor, found that the liquor substance of 2 liters of terminated air was somewhat more prominent than that of 1 cc of pee. Be that as it may, investigation into the potential outcomes of utilizing the breath to test for liquor in an individual's body dates as far back as 1874, when Francis E. Anstie mentioned the objective fact that limited quantities of liquor were discharged in the breath.

Additionally, in 1927 a Chicago scientist, William Duncan McNally, developed a breathalyzer in which the breath traveling through synthetic compounds in water would change the tone. One use for his innovation was for housewives to test whether their spouses had been drinking. In late 1927, for a situation in Marlborough, England, Dr. Gorsky, a Police Surgeon, requested that a suspect expand a football bladder with his breath. As nearly more than 1 liters of the man's breath contained 1.5 mg of ethanol, Dr. Gorsky affirmed under the steady gaze of the court that the respondent was "half-drunk".

In 1931 the primary viable side of the road breath-testing gadget was the flushed meter created by Rolla Neil Harger of the Indiana University School of Medicine. The alcoholic meter gathered a driver's breath test straightforwardly into an inflatable inside the machine. The breath test was then siphoned through a fermented potassium permanganate arrangement. In the event that there was liquor in the breath test, the arrangement changed tone. The more noteworthy the shading change, the more liquor there was available in the breath. The alcoholic meter was fabricated and sold by Stephenson Corporation of Red Bank, New Jersey.

In 1954 Robert Frank Borkenstein (1912–2002) was a skipper with the Indiana State Police and later an educator at Indiana University Bloomington. His Breathalyzer utilized compound oxidation and photometry to decide liquor focuses. Ensuing breath analyzers have changed over basically to infrared spectroscopy, however this strategy is liable to invalid outcomes relying upon surrounding air temperature, the temperature of the gadget, and the internal heat level of the subject, contingent upon particularity of the readings and how they correspond with one's BAC estimated through an intentional

blood draw. The innovation of the Breathalyzer gave law authorization an orally-intrusive test giving prompt outcomes to decide a person's breath liquor focus at the difficult period, in view of, as per this article, reliably broken samples.

In 1967 in Britain, Bill Ducie and Tom Parry Jones created and promoted the principal electronic breathalyzer. They set up Lion Laboratories in Cardiff. Ducie was a sanctioned electrical architect, and Tom Parry Jones was an instructor at UWIST. The Road Safety Act 1967 presented the main lawfully enforceable most extreme blood liquor level for drivers in the UK, above which it turned into an offense to be responsible for an engine vehicle; and presented the side of the road breathalyzer, made accessible to police powers across the country. The Breathalyzer was supplanted by the Lion Intoximeter 3000 of every 1983, and later by the Lion Alcoholmeter and Lion Intoxilyser. These later models utilized a power device liquor sensor as opposed to precious stones, giving a more solid curbside test and eliminating the requirement for blood or pee tests to be taken at a police headquarters. In 1991, Lion Laboratories was offered to the American organization MPD, Inc.



Fig 4.8.1: SCIENTIST CHECKING ALCOHOL CONTENT USING BALLOON

CIRCUIT DIAGRAM:

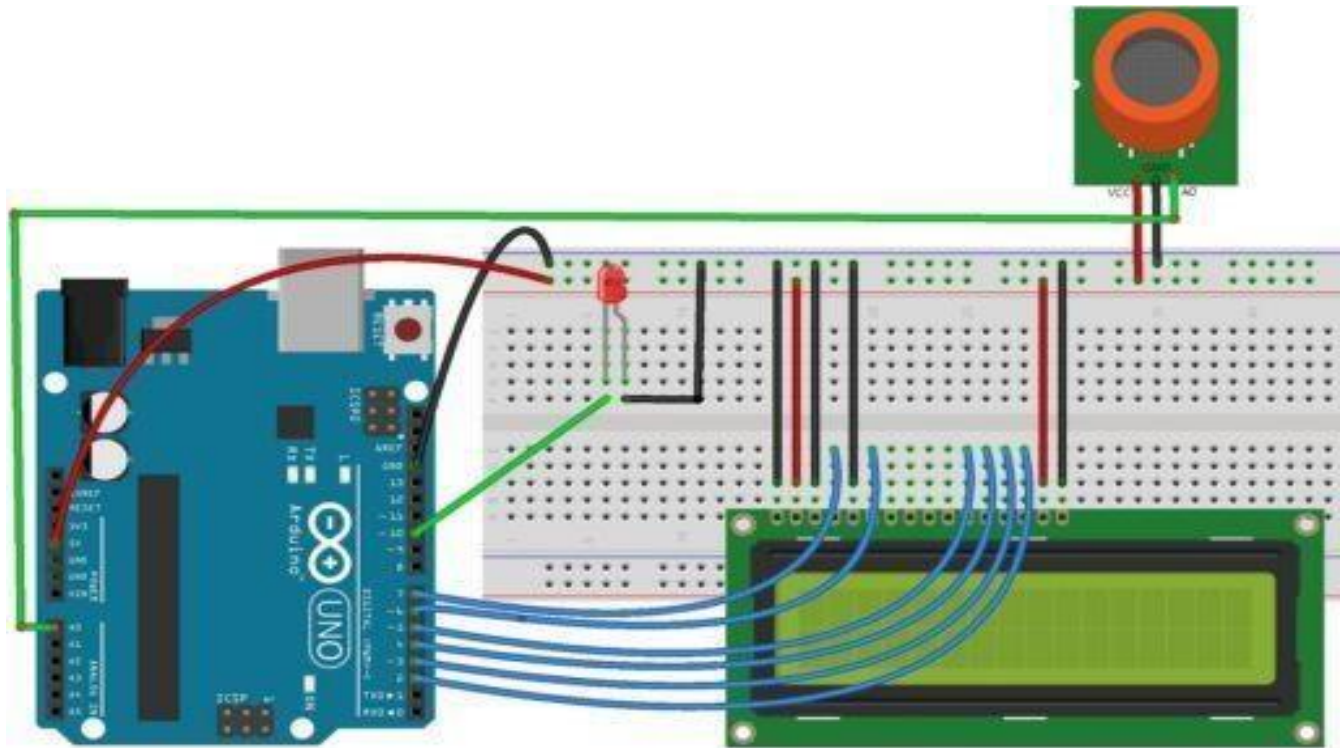


Fig 4.8.2: CIRCUIT DIAGRAM

LCD Pins 1, 3, 5, 16 is connected to GND

LCD Pins 2, 15 is connected to VCC (+5V)

LCD Pin 4 is connected to Arduino pin D7

LCD Pin 6 is connected to Arduino pin D6

LCD Pin 11 is connected to Arduino pin D5

LCD Pin 12 is connected to Arduino pin D4

LCD Pin 13 is connected to Arduino pin D3

LCD Pin 14 is connected to Arduino pin D2

MQ-135 Module Pin -GND is connected to GND

MQ-135 Module Pin +VCC is connected to VCC

MQ-135 Module Pin A0 is connected to Arduino Pin A0

LED Pin positive end is connected to Arduino Pin D10

LED Pin negative end is connected to GND

4.9 WORKING:

When a person consumes alcohol, the alcohol (ethanol) which is a very small molecule goes in through stomach and small intestine later it will mix into blood and there by travels to various parts of the body like brain, lungs etc. This is the reason behind dizziness of the person after alcohol consumption. Whenever person breathes out the ethanol evaporates and it comes out through the nose or mouth. So the more is the consumption of the alcohol the more is the concentration of ethanol. The ethanol that came out from the mouth of the person falls on the MQ- 135 Sensor which has a heating element inside a tabular casing due to which the ethanol gets converted to acetic acid, sensor is made up of SnO_2 material which has high resistance and low conductivity in clean air, whenever the ethanol cascades on the surface of SnO_2 the resistance decreases thereby conductivity increases. The variation of resistance is converted to voltage variation using the load resistance. This voltage variation is sent by the sensor to the Arduino in the form of analog signal. The analog signal is sensed and based on the code written in the Arduino IDE the output is obtained. We used LCD 16*2 display for displaying the output .We took 400ppm as a standard level. If the alcohol level is more than the LCD displays YOU ARE DRUNK message indicating there is alcohol presence. If the value is less then it indicates NORMAL LEVEL.

CHAPTER 05

SOFTWARE SPECIFICATION:

We are using Arduino develop environment. This software works in windows, Linux and mac OS. The programming can be written in java, C, C++. Arduino IDE provides software library for wiring programs as well. We can view output on the screen in the form of values or in the form of graph depending on what the user wants. The source code for the IDE is delivered under the GNU General Public License, variant 2. The Arduino IDE underpins the dialects C and C++ utilizing unique principles of code structuring. The code written by the person requires only two basic capacities, for beginning the sketch and the main program, that is gathered and attached with a program. The Arduino IDE utilizes the program to change over the executable code into a book document in 16 digit decimal encoding that is placed one after the other into the board of arduino by a uploader in the board. By default, is utilized as the transferring apparatus to streak the client code onto official Arduino boards.

Arduino Pro IDE

Developers: Arduino Software

Review discharge v0.1.2/14

September 2020

github.com/arduino/Arduino

Composed in: C, C++

Working system : Windows, macOS, Linux

Platform: IA-32, x86-64, ARM

Type: Integrated improvement climate

License: LGPL or GPL permit

Website : blog.arduino.cc/2020/08/24/cli-and-ide-improve-together/

With the rising prevalence of Arduino as a product stage, different sellers began to actualize custom open source compilers and apparatuses (centers) that can assemble and transfer portrayals to other microcontrollers that are not upheld by Arduino's authentic line of microcontrollers.

Advantages of using Arduino:

- No experience required to begin
- Genuinely ease, contingent upon shields you need
- Loads of representations and shields accessible
- No outside developer or force supply required

Disadvantages of using Arduino:

- AVR microcontroller is not understandable
- Sketches and shields are tough to change
- Debugger is not included for syntax verification
- C experience and some developer tools experience is not obtained

CHAPTER 06

RESULT AND DISCUSSION

The Breathalyzer is working perfectly as per our objectives. It takes breathe as input and based on the BAC levels, the MQ-135 Sensor gives analog output to the Arduino and using the loops condition in the code and the code is dumped into Arduino which interns helps for displaying output on the LCD Display .This helps us to identify if the person taking this test is drunk or not and the results are given instantly, time consumption is very less plus, sensitivity of the sensor can be varied depending on the demand where it is been used.

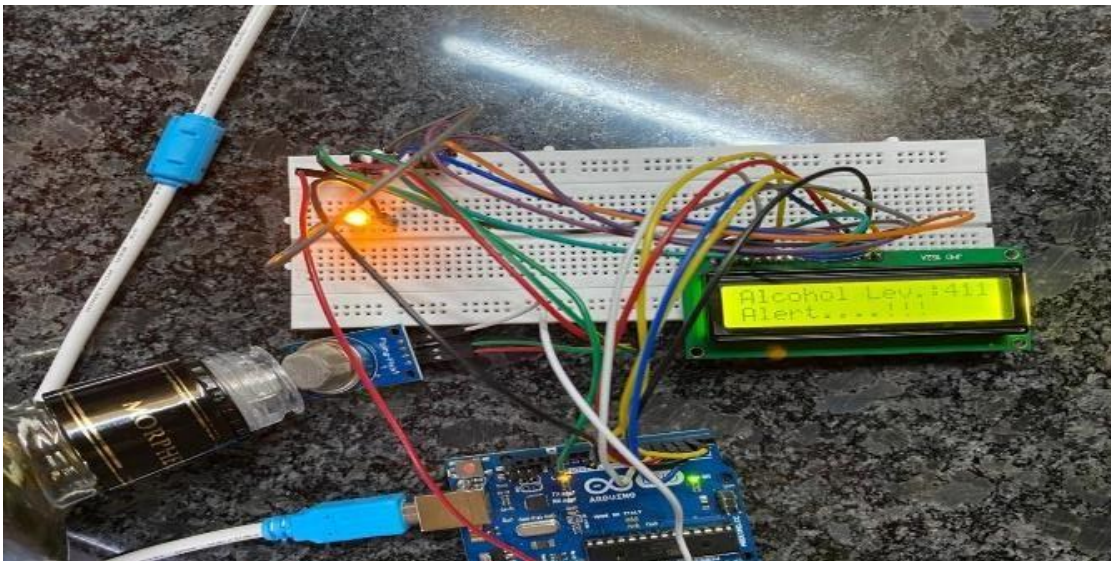


Fig 6.1: Output

Connections are made and 5v power supply is given, when MQ135 senses the alcohol , the alcohol level is shown is the LCD display and when the alcohol level exceeds 400, alert warning can be seen and the LED turns on.

CHAPTER 07

ADVANTAGES AND APPLICATIONS

ADVANTAGES:

- It will minimize the number of fatalities happening on road because of drunk driving
- It will help to minimize the damage caused to public property due to the increasing accidents
- It is very safe and there is no risk of harm or spread of infection to the person getting tested
- It is fast and not expensive
- Breathalyzer is designed to remain for a long period of time before replacement.
- The device life period is very long

APPLICATIONS:

The Breathalyzer is often used as evidence in cases when the driver's blood alcohol concentration (BAC) is 0.08% or above in the United States, often resulting in a DUI or DWI.

Youth is vulnerable to alcohol and they will usually try to hide drinking habits from their parents. Breathalyzers are one of the best devices, which will help to check alcohol takers at home. These devices are small in size, easy to carry, and less expensive.

CHAPTER 08

CONCLUSION AND FUTURE SCOPE

CONCLUSION:

- Breathalyzer is working as expected and we got the output accurately.
- The solution provided is effective to develop small devices for vehicles which will find the various amount of ethanol present in the breath of the person and would respond accordingly.

FUTURE SCOPE:

- The G.S.M technology can be implemented to inform the relatives, friends or owner of the vehicle whenever a person consumes alcohol..
- G.P.S technology can be implemented to find out the location of the vehicle