Model Design For Educational Administration Safety

B.E. Dissertation

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University of Mumbai

For the Degree of

Bachelor of Engineering
(Electronics and Telecommunication Engineering)

by

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Certificate

This is to certify that, the dissertation titled

"Model Design for Educational Administration Safety "

is a bonafide work done by

Ahmed Raza (14ET22)
Shaikh Shaziya (14ET09)

and is submitted in the partial fulfillment of the requirement for the degree of

Bachelor of Engineering
in
Electronics and Telecomunication Engineering
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University of Mumbai.

Guide	Project Coordinator
Head of Department	Principal

Certificate of Approval by Examiners

This is to certify that the dissertation entitled **"Model Design For Educational Administration Safety"** is a bonafide work done by **Ahmed Raza,Shaikh Shaziya** under the guidance of **Mr. Zarrar Ahmed Khan**. This dissertation has been approved for the award of **Bachelor's Degree in Electronics and Telecommunication Engineering**, University of Mumbai.

Examiners:

Name: Name:

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Abstract

This project focuses on the problem that is seen in all college premises .As we all know that initialization of any lecture does not occur on time. Impunctuality is seen over the timetable management system .As per analysis the main reason behind this project is irregularity in management system which has caused wastage of time. This setup help us to avoid wastage of time and maintain punctuality over the management system .Timely management of lectures and preventing lossage of time is the main motive of this innovation. Creating co-ordination and implementing uniformity are the important principles of this idea. This project ensures that all lectures are timely conducted which is must. It provides all the information on finger tips and help in saving time and provide better monitoring.For providing co-ordination between students and institute and also schedule of college we are creating this innovation.With students in our project we are displaying the timetable of every class of our department which will be displayed at the administration office.

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graphicx

ANJUMAN - I - ISLAM'S KALSEKAR
TECHNICAL CAMPUS, NEW PANVEL
ENGINEERING & TECHNOLOGY
ARCHITECTURE
PHARMACY
AKTC
NAVI MUMBAI - INDIA

Chapter 1

Introduction

1.1 Introduction

From many years , people have debated about the issue of timetable management which is not yet solved .Irregularities ,delaying ,mismanagement and misuse of time are problems arising nowadays.The co-ordination between students and institute is not more. This problem has also disturbed the balance of time and co-ordination between teachers and students. Unless we make an idea of removing this misuse of time , there will be no accuracy in our system. This project is designed keeping in view day to day problems faced by college. In this project we are displaying the timetable of our department .Timetable will be displayed outside the administration office..This not only define our timetable but also arrival and departure time of professor carrying out the lecture. Anyone from admin can know that which lecture is going on in a particular class.In this when the lecturer enter the class the colour of the display changes and by seeing that student and college staff can come to know that lecturer has entered the class.The strength of the students is displayed at the board and automatic attendance will be taken by detecting the face and the attendance gets automatically loaded.The time lecturer entered into the class is saved in the database and at the end of the month calculations are made. This helps in maintaining uniformity over the system and create perfect co-ordination between student and teacher which is a big achievement.

1.2 Motivation

This project totally eradicates impunctuality in the timetable management system.Wastage of time is totally removed.Secured and saved data removes the fear of lossage of data.It also maintains balance between the management system because of which all lectures are timely conducted.This project aims at monitoring and scheduling the timetable of every class.This scheduling helps in reducing wastage of time. It reduces the burden of administration office.It also helps the students by avoiding conflicts between the lectures of timetable.Anyone outside the class can come to know whether the lecturer is taking the class or not.

Chapter 2

Literature Survey

- Lecture Timetable Using Hybrid Genetic Algorithm:

  Overview: Timetabling process at present is a manual process which is modified over a period as problems and limitations are uncovered.During this process numerous aspects have to be taken into consideration.Almost a week is needed to produce a timetable for an average institution and the result is not often satisfactory.It does not meet all the requirements.Incase if the preconditions change the whole work becomes unusable and has to be restarted for beginning which needs more time.

  Review: Timetable scheduling usingGenetic Algorithm is an effort in the direction of automating the process of preparing the timetable of university.Good timetable generator not only takes essential conditions but also other conditions.

- **Model Design Of Administration Safety:**

  Overview: Educational administration is an important part and core component in the operations of universities.Educational universities is an important guarantee for promoting information construction and orderly operation of teaching but however in the open environment,educational administration system of universities has to face up too many threats that is wide range of hacking,virus infection and illegal invasion and so on.It can cause loss of data which will create a huge problem and has to face many problems.

  Review: These problems can be solved by considering aspects like using software like Php,Html,Java in educational system of universities and also analysis of key technology.

- **Exam Scheduling A Case Study:**

  Overview: The aspect of this paper is exam scheduling which includes large number of students, classes, professors and venues renders the manual scheduling process tidious and useless. This problem of paramount importance as educational institutes are moving towards the automation to cope with large number of students,classes, and instructors.

  Review: The exam scheduling weakness consist of:time slot during which the various exams can be scheduled ,typically these slots are uniform in duration and limited in number, resources are human and logistic element required to complete the exam in a correct manner,scheduling constraints are conditions that prevent the concorrent scheduling of exams.

- **A Computer-Based Monitoring System Applied To Project Management**

  Overview: This describes the development and implementation of an automated real-time monitoring system for construction projects programmed in a Delphi environment. The system links time-lapse digital movies of construction activities, critical path method (CPM) and progress control techniques. It accepts digital images taken from multiple cameras, stores them in chronological order and links them to a database that contains schedule information. The digital pictures taken from up to four cameras are placed on a website from where a remote computer(s) can capture and store the pictures in the database.

  Review: The system enables management staff at the contractor's and owner representatives' headquarters to follow developments at the construction site in real time. Additionally, time-lapse films of activities at the construction site taken by multiple cameras can be played back in synchrony with dynamic graphs showing planned versus actual schedules. PHOTO-NET II introduces a new concept in time-lapse photography that allows the user to manipulate the frame rate, enabling a reasonable playback time as well as the implementation of the technology for long-term construction projects using standard PCs. it has the two stage of solutions.The first stage is greeding algorithm.The second is genetic algorithm.The two algorithm works in tendem to generate the best exam time timetable automation of this process has greatly reduced the number of conflicts, exam days and the required venues.

Chapter 3

Existing Design Method

- An expressive event specification language for active databases: Making a database system active to meet the requirements of a wide range of applications entails developing an expressive event specification language and its implementation. Extant systems support mostly database events and in some cases a few predefined events. Essentially, parameter contexts augment the semantics of composite events for computing their parameters. For concreteness, we present parameter computation for the relational model. Finally, we show how a contingency plan that includes time constraints can be supported without stepping outside of the framework proposed in it.

- A Taxonomy of Workflow Management Systems for Grid Computing: With the advent of Grid and application technologies, scientists and engineers are building more and more complex applications to manage and process large data sets, and execute scientific experiments on distributed resources. Such application scenarios require means for composing and executing complex workflows. Therefore, many efforts have been made towards the development of workflow management systems for Grid computing. In this paper, we propose a taxonomy that characterizes and classifies various approaches for building and executing workflows on Grids. We also survey several representative Grid workflow systems developed by various projects world-wide to demonstrate the comprehensiveness of the taxonomy. The taxonomy not only highlights the design and engineering similarities and differences of state-of-the-art in Grid workflow systems, but also identifies the areas that need research.

- Hospital Management System Database : No one in this world is perfectly alright in case of health. Each and everyone is suffering from some or the other sickness. To solve the health problems of the human beings, hospitals play a major role. You can do any work only if you have a good health. To make the work of the staffs at the hospitals easier, this hospital management system can play a major role. Hospital management system is the system which is developed to minimize the pen paper work at the hospitals. It is the system that is used in the hospitals to maintain the records of the patients, doctors, nurses and other hospital staffs.The people select the best among the hospitals by considering the management and the system followed in the hospitals. So to make the hospital as one of the best compared to others, there should be good medical assistance provided, disciplined management and should offer the best services. The hospital management system database project will help to reduce the pen paper work in the hospitals if not completely. There will be many patients admitted in the hospitals. So to keep track about the information like patients personal details, treatment that is going on etc this system will be of great help. There will be doctors who treat these patients. One doctor can treat many patients. So the doctor and the patient are related in the database. This database can also contain the information regarding the doctors, nurses, pharmacists and other hospital staffs. The user will be able to get the information about the patients, doctors, nurses and other hospital staffs just in one click. But only the authorized user will be allowed to login with the unique username and password. If the information is stored through the means of pen and paper there is no guarantee that youre personal information will be secured. But through the usage of the hospital management system database, the security will be provided to your personal details.

3.1 Problem Statement

As we see that in colleges, databases are compulsory to keep to maintain records of the students about their attendance and other activities.This leads to wastage of lots of time in the management of timetable of a college which is not worth it.Creating database and managing all these stuff was leading to tidious work.Many people think that irregularity in management process has led to this problem.People are unable to solve this problem as this is a huge process and large number of people needs to be involved in it.It has also burdened the administration office to manage and conduct timely lectures.Conducting timely and punctual lectures is the main motive of any institute.

3.2 Project Overview

On the display the time table of SE, TE,BE will be delayed eg: if its 8:15 then item table of 8:15-9:15 will be displayed I Red if the lecture enters the class then the display colour will change from Red to Green and the total no of students in the class will also be displayed on the display and the attendance will be taken with help f the camera by face detection and will be enter into the ERP and the record of lecturer entered into the class leaving the class will be recorded it works on Serial communication the master Arduino will command the slave Arduino to change the time table and will address slave to scan the attendance of students etc.. Finger print sensor involves two processes;one is enrollment and second is searching process.If someone punches their finger it will assign the ID and search for the identity from the stored database.As soon as it finds the identity the attendance is recorded.It converts image into JPEG form and from JPEG form it converts into binary form so that computer can understand that language and store all this information in the database.The lectures adjusted and the total lectures taken by each faculty is also recorded and at the end of the month total calculations are made.

Chapter 4

Hardware Design

4.1 Practical Function of the Design

4.1.1 Arduino Mega 2560

The Arduino Mega 2560 is a microcontroller board based on the ATmega2560 (datasheet). It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Mega is compatible with most shields designed for the Arduino Duemilanove or Diecimila.The Mega 2560 is an update to the Arduino Mega, which it replaces.

Specification

- Microcontroller ATmega2560 Operating Voltage 5V
- Input Voltage (recommended) 7-12V Input Voltage
- (limits) 6-20V Digital I/O Pins 54 (of which 14 provide
- PWM output) Analog Input Pins 16 DC Current per

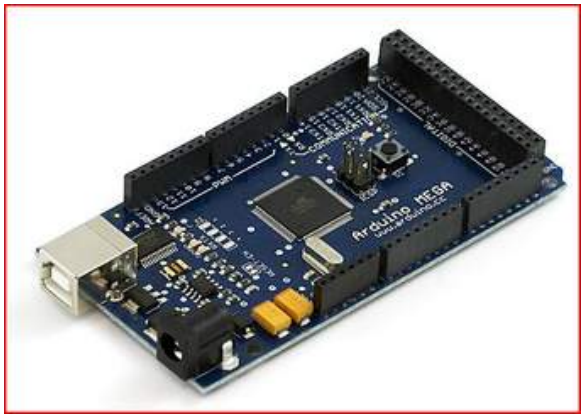

Figure 4.1: Arduino Mega

- I/O Pin 40 mA DC Current for 3.3V Pin 50 mA Flash
- Memory 256 KB of which 8 KB used by bootloader
- SRAM 8 KB EEPROM 4 KB Clock Speed 16 MHz

Power

The Arduino Mega can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector. The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts. The Mega2560 differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the ATmega16U2 (ATmega8U2 in the revision 1 and revision 2 boards) programmed as a USB-to-serial converter. Revision 2 of the Mega2560 board has a resistor pulling the 8U2 HWB line to ground, making it easier to put into DFU mode.

Memory

The ATmega2560 has 256 KB of flash memory for storing code (of which 8 KB is used for the bootloader), 8 KB of SRAM and 4 KB of EEPROM (which can be read and written with the EEPROM library).

Input and Output

Each of the 54 digital pins on the Mega can be used as an input or output, using pinMode(), digitalWrite(), and digitalRead() functions. They 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 kOhms. In addition, some pins have specialized functions:

- Serial: 0 (RX) and 1 (TX); Serial 1: 19 (RX) and 18 (TX); Serial 2: 17 (RX) and 16 (TX); Serial 3: 15 (RX) and 14 (TX). Used to receive (RX) and transmit (TX) TTL serial data. Pins 0 and 1 are also connected to the corresponding pins of the ATmega16U2 USB-to-TTL Serial chip.

- External Interrupts: 2 (interrupt 0), 3 (interrupt 1), 18 (interrupt 5), 19 (interrupt 4), 20 (interrupt 3), and 21 (interrupt 2). These pins can be configured to trigger an interrupt on a low value, a rising or falling edge, or a change in value. See the attachInterrupt() function for details.

- PWM: 0 to 13. Provide 8-bit PWM output with the analogWrite() function.

- SPI: 50 (MISO), 51 (MOSI), 52 (SCK), 53 (SS). These pins support SPI communication using the SPI library. The SPI pins are also broken out on the ICSP header, which is physically compatible with the Uno, Duemilanove and Diecimila.

- LED: 13. There is a built-in LED connected to digital pin 13. When the pin is HIGH value, the LED is on, when the pin is LOW, it's off.

- TWI: 20 (SDA) and 21 (SCL). Support TWI communication using the Wire library. Note that these pins are not in the same location as the TWI pins on the Duemilanove or Diecimila.

- The Mega2560 has 16 analog inputs, each of which provide 10 bits of resolution (i.e. 1024 different values). By default they measure from ground to 5 volts, though is it possible to change the upper end of their range using the AREF pin and analogReference() function.

- There are a couple of other pins on the board:

  AREF. Reference voltage for the analog inputs. Used with analog Reference(). Reset. Bring this line LOW to reset the microcontroller. Typically used to add a reset button to shields which block.

Communication

The Arduino Mega2560 has a number of facilities for communicating with computer, another Arduino, or other microcontrollers. The ATmega2560 provides four hardware UARTs for TTL (5V) serial communication. An ATmega16U2 (ATmega 8U2 on the revision 1 and revision 2 boards) on the board channels one of these over USB and provides a virtual com port to software on the computer (Windows machines will need a .inf file, but OSX and Linux machines will recognize the board as a COM port automatically. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the board. The RX and TX LEDs on the board will flash when data is being transmitted via the ATmega8U2/ATmega16U2 chip and USB connection to the computer (but not for serial communication on pins 0 and 1). A SoftwareSerial library allows for serial communication on any of the Mega2560's digital pins. The ATmega2560 also supports TWI and SPI communication. The Arduino software includes a Wire library to simplify use of the TWI bus; see the documentation for details. For SPI communication, use the SPI library.

Programming

The Arduino Mega can be programmed with the Arduino software (download). For details, see the reference and tutorials. The ATmega2560 on the Arduino Mega comes preburned with a bootloader that allows you to upload new code to it without the use of an external hardware programmer. It communicates using the original STK500 protocol (reference, C header files). You can also bypass the bootloader and program the microcontroller through the ICSP (In-Circuit Serial Programming) header; see these instructions for details. The ATmega16U2 (or 8U2 in the rev1 and rev2 boards) firmware source code is available in the Arduino repository. The ATmega16U2/8U2 is loaded with a DFU bootloader, which can be activated by: On Rev1 boards: connecting the solder jumper on the back of the board (near the map of Italy) and then resetting the 8U2. On Rev2 or later boards: there is a resistor that pulling the 8U2/16U2 HWB line to ground, making it easier to put into DFU mode. You can then use Atmel's FLIP software (Windows) or the DFU programmer (Mac OS X and Linux) to load a new firmware. Or you can use the ISP header with an external programmer (overwriting the DFU bootloader). See this user-contributed tutorial for more information.

Figure 4.2: Arduino Mega

Automatic (Software) Reset

Rather then requiring a physical press of the reset button before an upload, the Arduino Mega2560 is designed in a way that allows it to be reset by software running on a connected computer. One of the hardware flow control lines (DTR) of the ATmega8U2 is connected to the reset line of the ATmega2560 via a 100 nanofarad capacitor. When this line is asserted (taken low), the reset line drops long enough to reset the chip. The Arduino software uses this capability to allow you to upload code by simply pressing the upload button in the Arduino environment. This means that the bootloader can have a shorter timeout, as the lowering of DTR can be well-coordinated with the start of the upload. This setup has other implications. When the Mega2560 is connected to either a computer running Mac OS X or Linux, it resets each time a connection is made to it from software (via USB). For the following half-second or so, the bootloader is running on the Mega2560. While it is programmed to ignore malformed data (i.e. anything besides an upload of new code), it will intercept the first few bytes of data sent to the board after a connection is opened. If a sketch running on the board receives one-time configuration or other data when it first starts, make sure that the software with which it communicates waits a second after opening the connection and before sending this data. The Mega2560 contains a trace that can be cut to disable the auto-reset. The pads on either side of the trace can be soldered together to re-enable it. It's labeled "RESET-EN". You may also be able to disable the auto-reset by connecting a 110 ohm resistor from 5V to the reset line; see this forum thread for details.

USB Overcurrent Protection

The Arduino Mega2560 has a resettable polyfuse that protects your computer's USB ports from shorts and overcurrent. Although most computers provide their own internal protection, the fuse provides an extra layer of protection. If more than 500 mA is applied to the USB port, the fuse will automatically break the connection until the short or overload is removed.

Physical Characteristics and Shield Compatibility

The maximum length and width of the Mega2560 PCB are 4 and 2.1 inches respectively, with the USB connector and power jack extending beyond the former dimension. Three screw holes allow the board to be attached to a surface or case. Note that the distance between digital pins 7 and 8 is 160 mil (0.16"), not an even multiple of the 100 mil spacing of the other pins. The Mega2560 is designed to be compatible with most shields designed for the Uno, Diecimila or Duemilanove. Digital pins 0 to 13 (and the adjacent AREF and GND pins), analog inputs 0 to 5, the power header, and ICSP header are all in equivalent locations. Further the main UART (serial port) is located on the same pins (0 and 1), as are external interrupts 0 and 1 (pins 2 and 3 respectively). SPI is available through the ICSP header on both the Mega2560 and Duemilanove / Diecimila. Please note that I2C is not located on the same pins on the Mega (20 and 21) as the Duemilanove / Diecimila (analog inputs 4 and 5).Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards or Breadboards (shields) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler toolchains, the Arduino project provides an integrated development environment (IDE) based on the Processing language project.

The Arduino project started in 2003 as a program for students at the Interaction Design Institute Ivrea in Ivrea, Italy,[2] aiming to provide a low-cost and easy way for novices and professionals to create devices that interact with their environment using sensors and actuators. Common examples of such devices intended for beginner hobbyists include simple robots, thermostats, and motion detectors.

4.1.2 LED dot matrix

Introduction

A LED matrix or LED display is a large, low-resolution form of dot-matrix display, useful both for industrial and commercial information displays as well as for hobbyist humanmachine interfaces. It consists of a 2-D diode matrix with their cathodes joined in rows and their anodes joined in columns (or vice versa). By controlling the flow of electricity through each row and column pair it is possible to control each LED individually. By multiplexing, scanning across rows, quickly flashing the LEDs on and off, it is possible to create characters or pictures to display information to the user.By varying the pulse rate per LED, the display can approximate levels of brightness. Multi-colored LEDs or RGB-colored LEDs permit use as a full-color image display. The refresh rate is typically fast enough to prevent the human eye from detecting the flicker. A dot-matrix display is a display device used to display information on machines, clocks, railway departure indicators and many other devices requiring a simple display device of limited resolution.The display consists of a dot matrix of lights or mechanical indicators arranged in a rectangular configuration (other shapes are also possible, although not common) such that by switching on or off selected lights, text or graphics can be displayed.

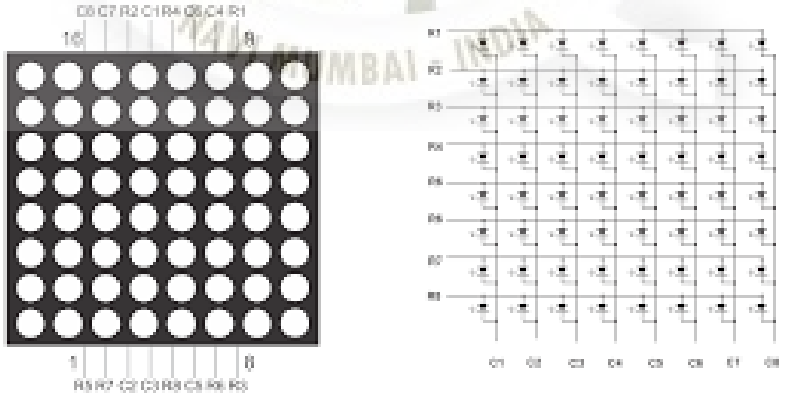

Figure 4.3: LED Matrix

Single colour LED dot matrix

LED Matrix 8*8 provides Red Perspex Cover.It is easy to connect with standard 40 pin connection which makes it easy to implement.It is 9V power supply which is connected on B.The length of LED matrix 72mm and width is 123mm.

Figure 4.4: LED Single Matrix

Bicolour LED Matrix

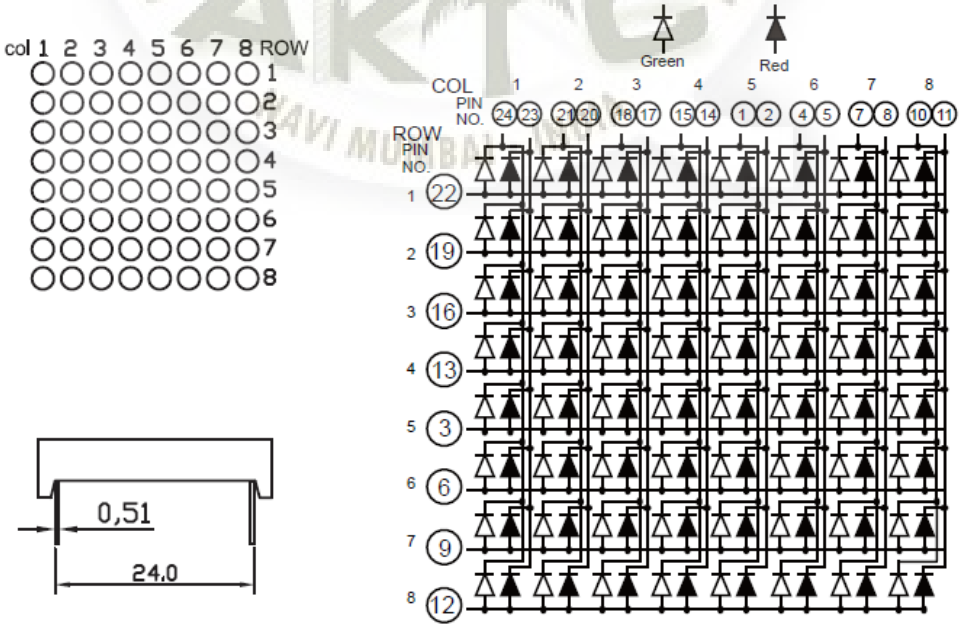

Figure 4.5: Pin Diagram

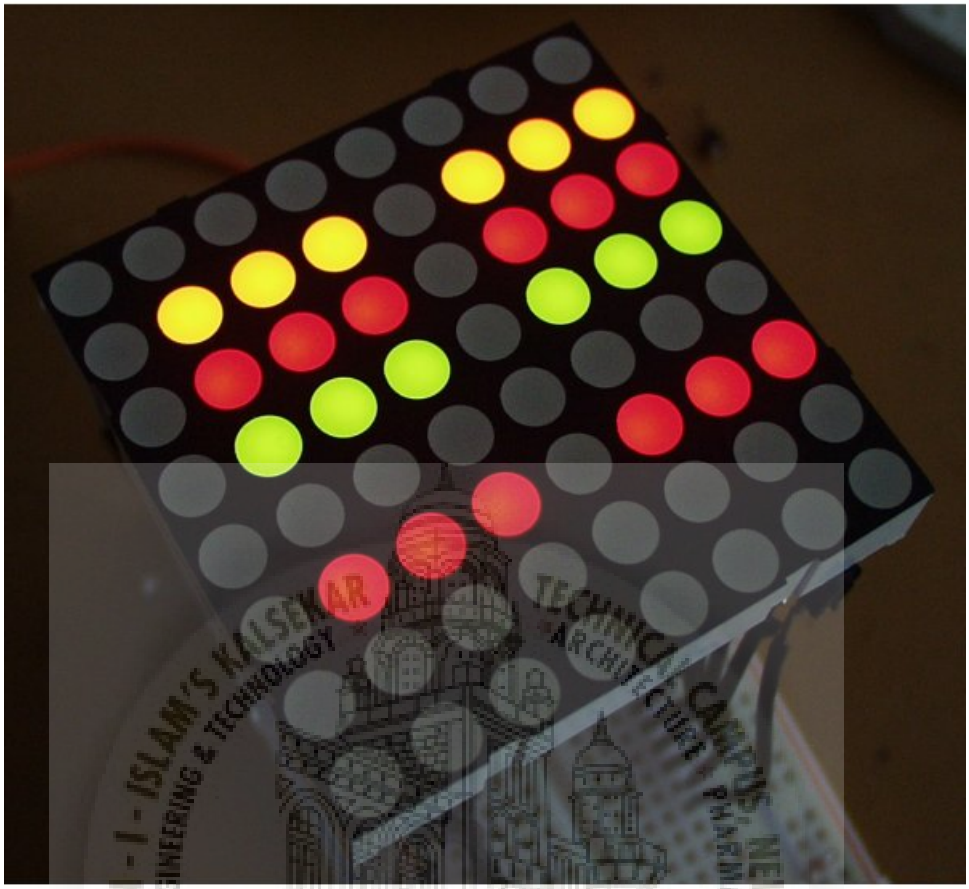

Figure 4.6: Bicolour LED Matrix

A light-emitting diode (LED) is a two-lead semiconductor light source. It is a pn junction diode that emits light when activated.When a suitable current is applied to the leads,electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called electroluminescence, and the color of the light (corresponding to the energy of the photon) is determined by the energy band gap of the semiconductor. LEDs are typically small and integrated optical components may be used to shape the radiation pattern.The earliest LEDs emitted low-intensity infrared light.Infrared LEDs are still frequently used as transmitting elements in remote-control circuits, such as those in remote controls for a wide variety of consumer electronics. The first visible-light LEDs were of low intensity and limited to red. Modern LEDs are available across the visible, ultraviolet, and infrared wavelengths, with very high brightness.

4.2 Fingerprint

4.2.1 Introduction

A fingerprint in its narrow sense is an impression left by the friction ridges of a human finger. The recovery of fingerprints from a crime scene is an important method of forensic science. Fingerprints are easily deposited on suitable surfaces (such as glass or metal or polished stone) by the natural secretions of sweat from the eccrine glands that are present in epidermal ridges. These are sometimes referred to as "Chanced Impressions". In a wider use of the term, fingerprints are the traces of an impression from the friction ridges of any part of a human or other primate hand. A print from the sole of the foot can also leave an impression of friction ridges. Deliberate impressions of fingerprints may be formed by ink or other substances transferred from the peaks of friction ridges on the skin to a relatively smooth surface such as a fingerprint card.Fingerprint records normally contain impressions from the pad on the last joint of fingers and thumbs, although fingerprint cards also typically record portions of lower joint areas of the fingers. Human fingerprints are detailed, nearly unique, difficult to alter, and durable over the life of an individual, making them suitable as long-term markers of human identity. They may be employed by police or other authorities to identify individuals who wish to conceal their identity, or to identify people who are incapacitated or deceased and thus unable to identify themselves, as in the aftermath of a natural disaster. Fingerprint analysis, in use since the early 20th century, has led to many crimes being solved. This means that many criminals consider gloves essential. Two of the first smartphone manufacturers to integrate fingerprint recognition into their phones were Motorola with the Atrix 4G in 2011, and Apple with the iPhone 5S on 10 September 2013. One month after, HTC launched the One Max, which also included fingerprint recognition. In April 2014, Samsung released the Galaxy S5, which integrated a fingerprint sensor on the home button.Since December 2015, cheaper smartphones with fingerprint recognition have been released.

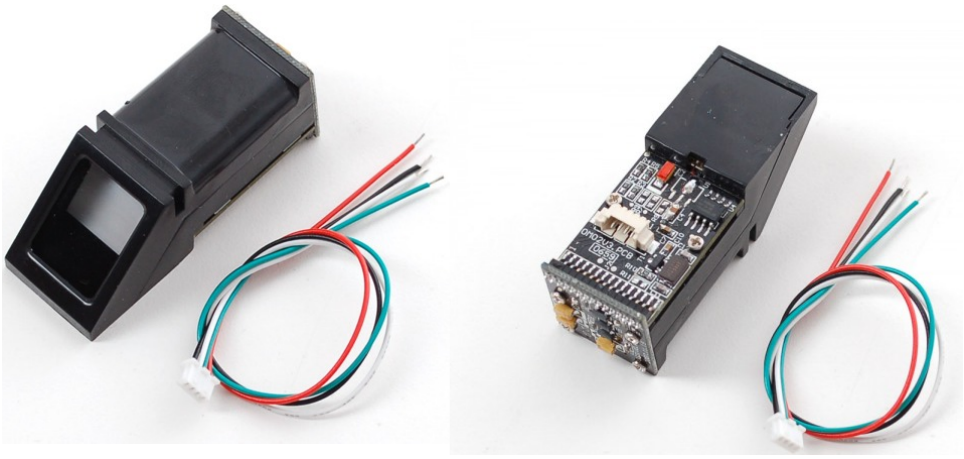

Figure 4.7: Finger Print Sensor

On 25 September 2015 with iPhone 6s, two years after introduction of its first fingerprint scanner in the iPhone 5S, Apple introduced a new generation fingerprint scanner claiming faster response times. In August 2016, OPPO claimed 0,22s response time in its Oppo F1's model. Hewlett Packard, Asus, Huawei, Lenovo and Appleare using fingerprint reader in their laptops.Synaptics says the SecurePad sensor is now available for OEMs to start building into their laptops.Biometric devices have used man over a long period of time. Non-automated biometric devices have used us since 500 BC as it was seen that Babylonian business transactions were recorded on clay tablets that included fingerprints. Automation in Biometric devices was first seen in the 1960s.The FBI in the 1960s, introduced the Indentimat, which started checking for fingerprints to maintain criminal records. The first systems measured the shape of the hand and the length of the fingers. Although discontinued in the 1980s, the system set a precedent for future Biometric Devices.Biometrics are being used to establish better and accessible records of the hours employee's work. With the increase in "Buddy Punching"(a case where employees clocked out coworkers and fraudulently inflated their work hours) employers have looked towards new technology like fingerprint recognition to reduce such fraud. Additionally, employers are also faced with the task of proper collection of data such as entry and exit times. Biometric devices make for largely foul proof and reliable ways of enabling to collect data as employees have to be present to enter biometric details which are unique to them.

4.2.2 Finger Print Sensor Module

Introduction

This is a fingure print sensor module with TTL UART interface for direct connections to microcontroller UART or to PC through MAX232 / USB-Serial adapter. The user can store the finger print data in the module and can configure it in 1:1 or 1: N mode for identifying the person.The FP module can directly interface with 3v3 or 5v Microcontroller. A level converter (like MAX232) is required for interfacing with PC serial port. Optical biometric fingerprint reader with great features and can be embedded into a variety of end products, such as: access control, attendance, safety deposit box, car door locks.

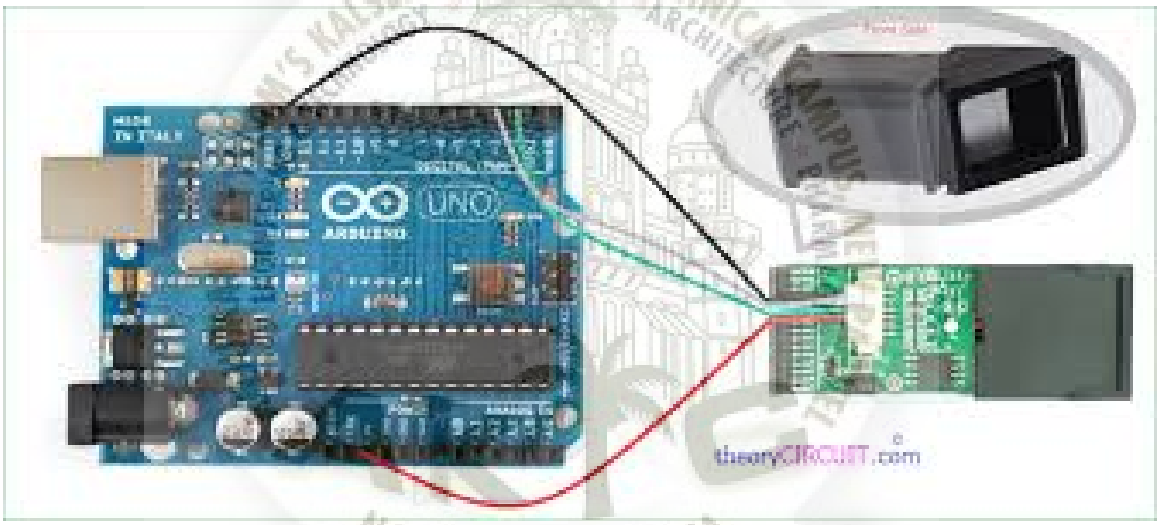

Figure 4.8: Finger Print Sensor Module

Features

- Integrated image collecting and algorithm chip together, ALL-in-One
- Fingerprint reader can conduct secondary development, can be embedded into a variety of end products
- Low power consumption, low cost, small size, excellent performance
- Professional optical technology, precise module manufacturing techniques

Specifications

Fingerprint sensor type: Optical

- Sensor Life: 100 million times
- Static indicators: 15KVBacklight: bright green
- Interface: USB1.1/UART(TTL logical level)
- RS232 communication baud rate: 4800BPS 115200BPS changeable
- Dimension: 55*32*21.5mm
- Image Capture Surface 1518(mm)
- Verification Speed: 0.3 sec
- Scanning Speed: 0.5 sec
- Character file size: 256 bytes
- Template size: 512 bytes
- Storage capacity: 250
- Security level: 5 (1,2,3,4,5(highest)
- False Acceptance Rate (FAR) :0.0001
- False Rejection Rate (FRR): 0.1
- Resolution 500 DPI
- Voltage :3.6-6.0 VDC
- Working curren: Typical 90 mA, Peak 150mA
- Matching Method: 1: N
- operating Environment Temperature: -20 to 45 centigrades

PC Application

The fingerprint sensor can be wired. Do not follow colour code of connector provided. The corner pin is +5V in red line, then is Ground(GND), Then TXD which goes to MCU's RX-IN, and last pin is RXD which goes to MCU's TX-OUT pin. Fingerprint authentication refers to the automatedmethod of verifying a match between two human fingerprints. Fingerprints are one of many forms of biometrics used to identify individuals and verify their identity.

The analysis of fingerprints for matching purposes generally requires the comparison of several features of the print pattern. These include patterns, which are aggregate characteristics of ridges, and minutia points, which are unique features found within the patterns.[1] It is also necessary to know the structure and properties of human skin in order to successfully employ some of the imaging technologies.

Patterns

The three basic patterns of fingerprint ridges are the arch, loop, and whorl:

arch: The ridges enter from one side of the finger, rise in the center forming an arc, and then exit the other side of the finger. loop: The ridges enter from one side of a finger, form a curve, and then exit on that same side. whorl: Ridges form circularly around a central point on the finger. Scientists have found that family members often share the same general fingerprint patterns, leading to the belief that these patterns are inherited.

Fingerprint processing

Fingerprint processing has three primary functions: enrollment, searching and verification. A reason is that the way people put their fingerprints on a mirror to scan can affect to the result in the searching and verifying process. Regarding to verification function, there are several techniques to match fingerprints such as correlation-based matching, minutiae-based matching, ridge feature-based matching and minutiae-based algorithm. However, the most popular algorithm was minutiae based matching algorithm due to its efficiency and accuracy.

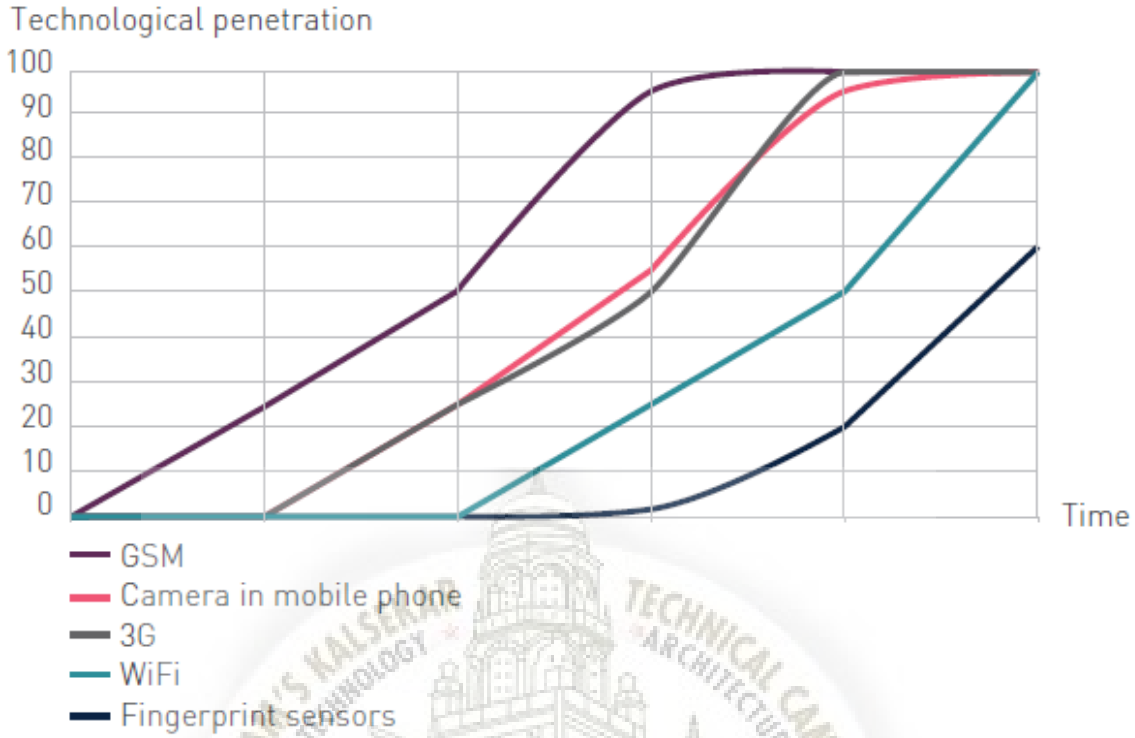

Figure 4.9: Pattern

Minutiae features

The major minutia features of fingerprint ridges are ridge ending, bifurcation, and short ridge (or dot). The ridge ending is the point at which a ridge terminates. Bifurcations are points at which a single ridge splits into two ridges. Short ridges (or dots) are ridges which are significantly shorter than the average ridge length on the fingerprint. Minutiae and patterns are very important in the analysis of fingerprints since no two fingers have been shown to be identical.

Defeats

In 2002, a Japanese cryptographer demonstrated how fingerprint recognition devices can be fooled 4 out of 5 times using a combination of low cunning, cheap kitchen supplies and a digital camera. Latent fingerprints from a glass were enhanced with super-glue fumes in the form of cyanoacrylateadhesive and photographed. An image editor was then used to improve the contrast.

4.2.3 RTC DS1307

Introduction

A real-time clock (RTC) is a computer clock (most often in the form of an integrated circuit) that keeps track of the current time. Although the term often refers to the devices in personal computers, servers and embedded systems, RTCs are present in almost any electronic device which needs to keep accurate time. A common RTC used in single-board computers is the DS1307.The DS1307 Serial Real-Time Clock is a low power, fully binary-codeddecimal(BCD) clock/calendar plus 56 bytes of NV SRAM. Address and Data are transferred serially via a 2 wire I2C protocol bus, The clock/calender provides second, minute, hours, day, date, month and year information. The end of the month Date is automatically adjust for months with fewer than year 31days, including corrections for leap year. The clock operates in either the 24 hours or 12hour format with Am/Pm indicator. The DS1307 has a built in power senses circuit that detects power failure and automatically switches too the battery supply The DS1307 operates as a slave device on the serial bus.Access is obtained by implementing a START condition and providing a device identification code followed by a register address. Subsequent registers can be accessed sequentially until a STOP condition is executed. When VCC falls below 1.25 x VBAT the device terminates an access in progress and resets the device address counter. Inputs to the device will not be recognized at this time to prevent erroneous data from being written to the device from an out of 4 tolerance system. When VCC falls below VBAT the device switches into a low-current battery backup mode. Upon power-up, the device switches from battery to VCCwhen VCC is greater than VBAT + 0.2V and recognizes inputs when VCC is greater than 1.25 x VBAT.The DS1307 Serial Real-Time Clock is a low-power, full binary-coded decimal (BCD) clock/calendar plus 56 bytes of NV SRAM. Address and data are transferred serially via a 2-wire, bi-directional bus. The clock/calendar provides seconds, minutes, hours, day, date, month, and year information. The end of the month date is automatically adjusted for months with fewer than 31 days, including corrections for leap year. The clock operates in either the 24-hour or 12-hour format with AM/PM indicator. The DS1307 has a built-in power sense circuit that detects power failures.

Figure 4.10: RTC

Terminology

The term real-time clock is used to avoid confusion with ordinary hardware clocks which are only signalsthat govern digital electronics, and do not count time in human units. RTC should not be confused with real-time computing, which shares its three-letter acronym but does not directly relate to time of day.The clock also usually formed the basis of computers' software timing chains; e.g. it was usually the timer used to switch tasks in an operating system. Counting timers used in modern computers provide similar features at lower precision, and may trace their requirements to this type of clock. (e.g. in the PDP-8, the mains-based clock, model DK8EA, came first, and was later followed by a crystal-based clock, DK8EC.)

Purpose

Although keeping time can be done without an RTC, using one has benefits: Low power consumption(important when running from alternate power) Frees the main system for time-critical tasks Sometimes more accurate than other method.A GPS receiver can shorten its startup time by comparing the current time, according to its RTC, with the time at which it last had a valid signal. If it has been less than a few hours, then the previous ephemeris is still usable.Some older computer designs such as Novas and PDP-8s used a real-time clock that was notable for its high accuracy, simplicity, flexibility and low cost. The computer's power supply produces a pulse at logic voltages for either each half-wave or each zero crossing of AC mains. A wire carries the pulse to an interrupt. The interrupt handler software counts cycles, seconds, etc. In this way, it can provide an entire clock and calendar.

A software-based clock must be set each time its computer is turned on. Originally this was done by computer operators. When the Internet became commonplace, network time protocols were used to automatically set clocks of this type.

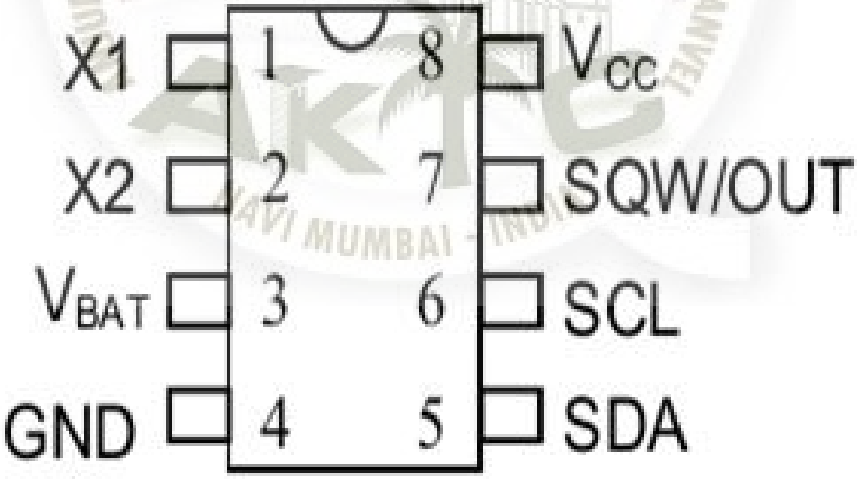

Figure 4.11: Pin Diagram

4.2.4 IC7219

MAX7219 display is a 8 digit seven segment display module which is based upon the Maxim MAX7219 LED display driver.It uses two standard 4 digit seven segment displays to display a total of 8 digits in RED with decimal point.The MAX7219 are compact, serial input/output common-cathode display drivers that interface microprocessors to 7-segment numeric LED displays of up to 8 digits or 64 individual LED's.This displays are used in Bar graph displays,Industrial controllers,Panel meters,LED matrix displays. Using a 7219 you can drive 64 LEDs while you only need 3 wires to interface it to a microcontroller (This excludes VCC and GND which are assumed to be available).In addition you can daisy chain multiple 7219 chips for bigger displays. There are 16 output lines from the 7219 driving 64 individual.

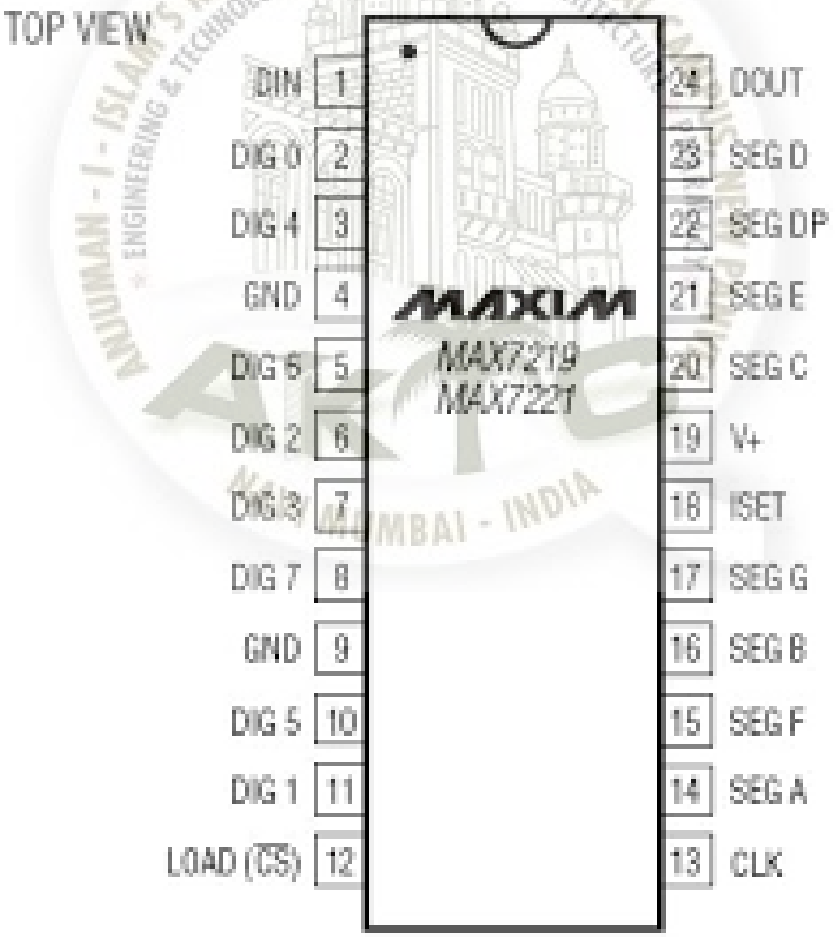

Figure 4.12: Pin Diagram

This sounds impossible but the driving method makes use of the way our eyes work. Persistence of vision is exploited to make the LEDs appear to be on all the time when in fact they are not. In fact the LEDs are arranged as an 8x8 set of rows and columns. Each column is pulsed for a short time while the row bits for that column are driven. Our eyes remember a flash of light for approximately 20ms, so when you continuously flash a light (or an LED) at a rate at or faster than 20ms, then it appears that the light never goes off. This is how the 7219 works. All the leds are individually turned on for a short time, at rate greater than 20ms.

- 10MHz Serial Interface
- Individual LED Segment Control
- Decode/No-Decode Digit Selection
- 150A Low-Power Shutdown
- Display Blanked on Power-Up
- Drive Common-Cathode LED Display
- Slew-Rate Limited Segment Drivers for Lower EMI (MAX7221)
- SPI, QSPI, MICROWIRE Serial Interface (MAX7221)
- 24-Pin DIP and SO Package Integrated circuits were made practical by mid-20th-century technology advancements in semiconductor device fabrication. Since their origins in the 1960s, the size, speed, and capacity of chips have progressed enormously, driven by technical advances that fit more and more transistors on chips of the same size - a modern chip may have several billion transistors in an area the size of a human fingernail. These advances, roughly following Moore's law, make computer chips of today possess millions of times the capacity and thousands of times the speed of the computer chips of the early 1970s.

  ICs have two main advantages over discrete circuits: cost and performance. Cost is low because the chips, with all their components, are printed as a unit by photolithography rather than being constructed one transistor at a time. Furthermore, packaged ICs use much less material than discrete circuits.

4.3 MAX7219 LED Display Module

MAX7219 8 Digit LED Display Module is one of the most popular and widely available display module, used already in many 8/16/32 bit MCU Projects, now is time to see it working also in the ESP8266 CBDBv2 EVO ecosystem The MAX7219 are compact, serial input/output common-cathode display drivers that interface microprocessors (Ps) to 7-segment numeric LED displays of up to 8 digits, bar-graph displays, or 64 individual LEDs. Included on-chip are a BCD code-B decoder, multiplex scan circuitry, segment and digit drivers, and an 8x8 static RAM that stores each digit. Only one external resistor is required to set the segment current for all LEDs. A convenient 4-wire serial interface connects to all common Ps. Individual

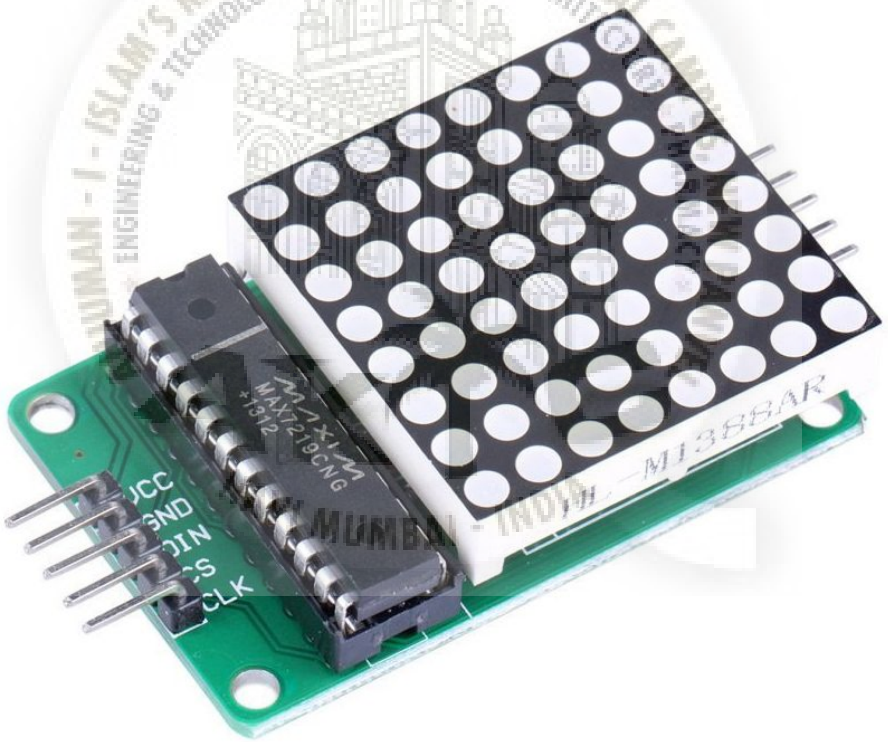

Figure 4.13: 7219 Module

digits may be addressed and updated without rewriting the entire display. The MAX7219 also allow the user to select code-B decoding or no-decode for each digit.

The devices include a 150A low-power shutdown mode, analog and digital brightness control, a scan-limit register that allows the user to display from 1 to 8 digits, and a test mode that forces all LEDs on. This is a 5V operation device. If you need to run it by the book at 3.3V Logic Level you will need to use a level shifter. In practice, as you will see below, you can try and run it directly, a bit out of spec. As MAX7219 HIGH logic level is at 3.5V...well...looks like it's working quite OK also in this way, in 48 hours of continuous running no freeze or strange behaviour.The MAX7219 LED driver saves you processor pins and processing time. Below, you can find out exactly why this is true and how you can use these devices on an Arduino. You'll also see how to use multiple devices without using any more processor pins!Using a 7219 you can drive 64 LEDs while you only need 3 wires to interface it to a microcontroller (This excludes VCC and GND which are assumed to be available). In addition you can daisy chain multiple 7219 chips for bigger displays.

There are 16 output lines from the 7219 driving 64 individual LEDs. This sounds impossible but the driving method makes use of the way our eyes work. Persistence of vision is exploited to make the LEDs appear to be on all the time when in fact they are not. In fact the LEDs are arranged as an 8x8 set of rows and columns. Each column is pulsed for a short time while the row bits for that column are driven.

Our eyes remember a flash of light for approximately 20ms, so when you continuously flash a light (or an LED) at a rate at or faster than 20ms, then it appears that the light never goes off. This is how the 7219 works. All the leds are individually turned on for a short time, at rate greater than 20ms.

4.4 IC74244

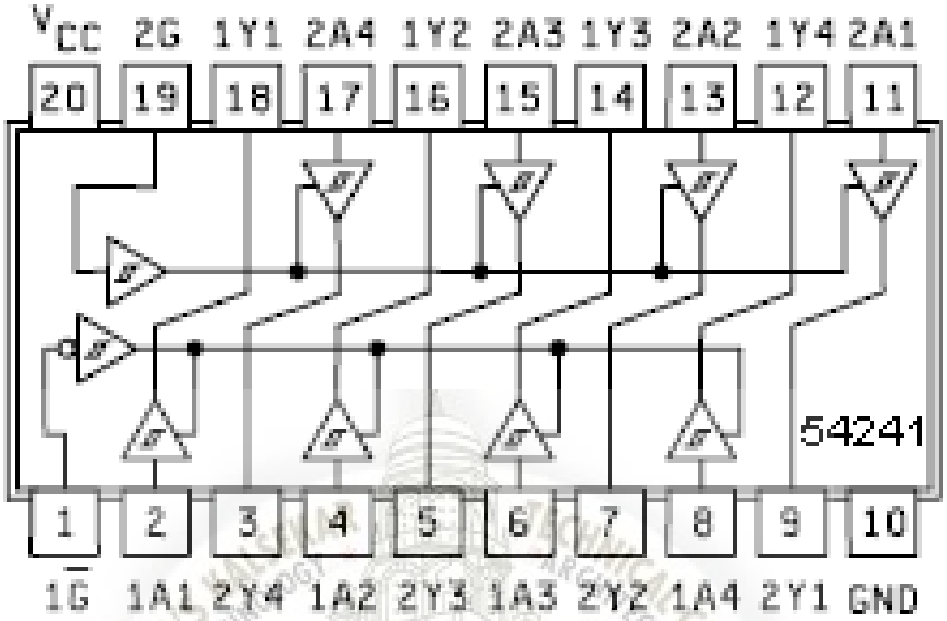

Figure 4.14: IC74244

IC 8-Bit Buffer. used to drive data onto a 8-bit data bus. Note that the chip displayed indicates OE control of the output [Output Enable]. So the outputs could be taken tri-state if required. The functional IC is split into two 4-bit sections, so they could be operated together or separately, driving one 8-bit bus or two separate 4-bit buses. Design Hint; Because this chip is used to drive a bus, which may be capacitive loaded, use more than the normal by-pass capacitor to insure that the IC has the current it needs when the buffers begin to drive the bus. Using just the standard .1uF capacitor may not be able to supply the required current fast enough to allow the 74244 to switch at the required speed. Also refer to Logic Family vs Switching Speed. The problem becomes more noticeable with faster logic families [a 74244 switches faster than a 74244 buffer]. Add a second by-pass capacitor, and place both by-pass capacitors as close to the Vcc line as possible.

III. Specification ARDUINO: Microcontroller ATmega2560

- Operating Voltage 5V
- Input Voltage (recommended) 7-12V
- Input Voltage (limits) 6-20V
- Digital I/O Pins 54 (of which 14 provide PWM output)
- Analog Input Pins 16
- DC Current per I/O Pin 40 mA
- DC Current for 3.3V Pin 50 mA
- SRAM 8 KB
- EEPROM 4 KB
- Clock Speed 16 MHz
- DRIVER: Voltage (with respect to GND)
- V+ .....-0.3V to 6V
- DIN, CLK, LOAD, CS .....-0.3V to 6V
- All Other Pins.....-0.3V to (V+ + 0.3V)
- Current
- DIG0DIG7 Sink Current.....500mA
- SEGAG, DP Source
- Current.....100mA
- Continuous Power Dissipation (TA = +85C)
- DS1307: Voltage on Any Pin Relative to Ground -0.5V to +7.0V
- Storage Temperature -55C to +125C

- Soldering Temperature 260C for 10 seconds DIP
- See JPC/JEDEC Standard J-STD-020A for Surface Mount Devices
- ICCS specified with VCC = 5.0V and SDA, SCL = 5.0V

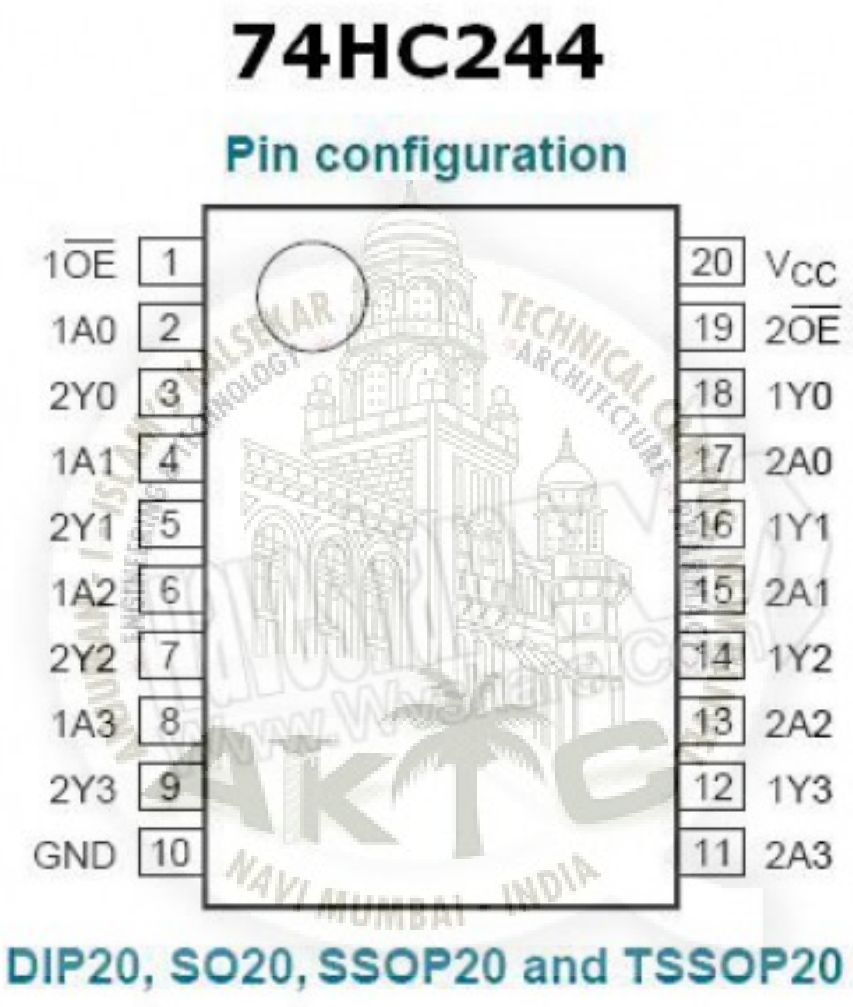

Figure 4.15: Pin Diagram

Chapter 5

Software Design

The software used here is Visual Basic. The software used here is Visual Basic. Visual Basic is a third-generation event-driven programming language and integrated development environment (IDE) from Microsoft for its Component Object Model(COM) programming model first released in 1991 and declared legacy during 2008. Microsoft intended Visual Basic to be relatively easy to learn and use. Visual Basic was derived from BASIC, a user-friendly programming language designed for beginners, and it enables the rapid application development (RAD) of graphical user interface (GUI) applications, access to databases using Data Access Objects, Remote Data Objects, or ActiveX Data Objects, and creation of ActiveXcontrols and objects. A programmer can create an application using the components provided by the Visual Basic program itself. Over time the community of programmers developed third-party components.Programs written in Visual Basic can also use the Windows API, which requires external function declarations. The final release was version 6 in 1998 (now known simply as Visual Basic). On April 8, 2008, Microsoft stopped supporting Visual Basic 6.0 IDE. The Microsoft Visual Basic team still maintains compatibility for Visual Basic 6.0 applications on Windows Vista, Windows Server 2008 including R2, Windows 7, Windows 8, Windows 8.1, Windows Server 2012 and Windows 10 through its "It Just Works" program. In 2014, some software developers still preferred Visual Basic 6.0 over its successor, Visual Basic .NET. In 2014 some developers lobbied for a new version of Visual Basic 6.0. In 2016, Visual Basic 6.0 won the technical impact award at

The 19th Annual D.I.C.E. Awards. A dialect of Visual Basic, Visual Basic for Applications (VBA), is used as a macro or scripting language within several Microsoft applications, including Microsoft Office. Forms are created using drag-and-drop techniques. A tool is used to place controls (e.g., text boxes, buttons, etc.) on the form (window). Controls have attributes and event handlers associated with them. Default values are provided when the control is created, but may be changed by the programmer. Many attribute values can be modified during run time based on user actions or changes in the environment, providing a dynamic application. For example, code can be inserted into the form resize event handler to reposition a control so that it remains centered on the form, expands to fill up the form, etc. By inserting code into the event handler for a keypress in a text box, the program can automatically translate the case of the text being entered, or even prevent certain characters from being inserted. Visual Basic can create executables (EXE files),

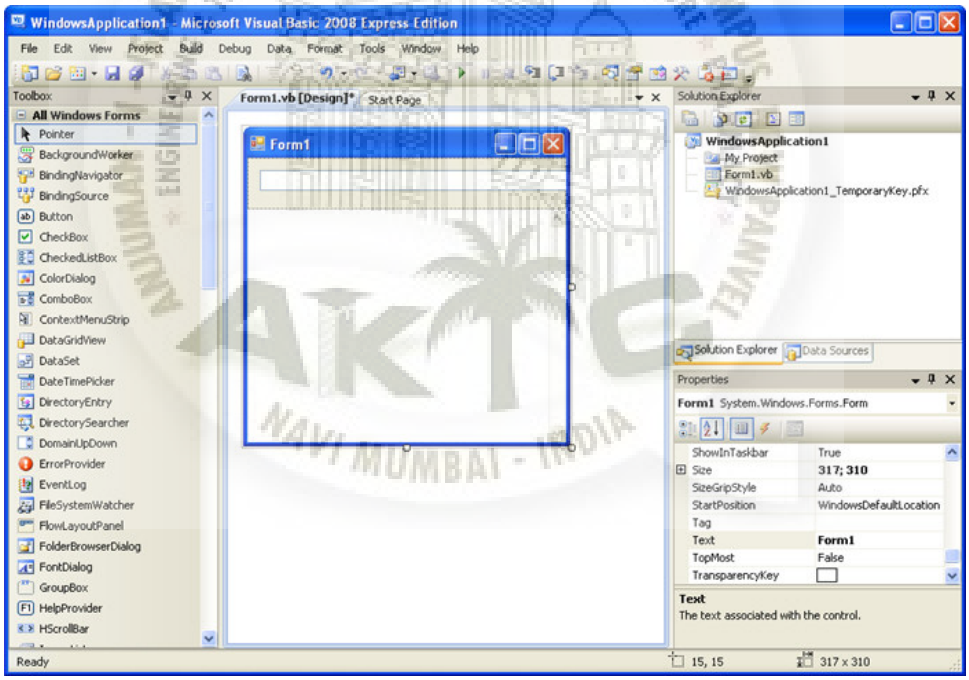

Figure 5.1: Visual Basic

ActiveX controls, or DLL files, but is primarily used to develop Windows applications and to interface database systems. Dialog boxes with less functionality can be used to provide pop-up capabilities. Controls provide the basic functionality of the application, while programmers can insert additional logic within the appropriate

event handlers. For example, a drop-down combination box automatically displays a list. When the user selects an element, an event handler is called that executes code that the programmer created to perform the action for that list item. Alternatively, a Visual Basic component can have no user interface, and instead provide ActiveX objects to other programs via Component Object Model (COM). This allows for server-side processing or an add-in module. The runtime recovers unused memory using reference counting, which depends on variables passing out of scope or being set to Nothing, avoiding the problem of memory leaks common to other languages. There is a large library of utility objects, and the language provides basic support for object-oriented programming. Unlike many other programming languages, Visual Basic is generally not case-sensitivethough it transforms keywords into a standard case configuration and forces the case of variable names to conform to the case of the entry in the symbol table. String comparisons are case sensitive by default. The Visual Basic compiler is shared with other Visual Studio languages (C, C++). Nevertheless, by default the restrictions in the IDE do not allow creation of some targets (Windows model DLLs) and threading models, but over the years, developers have bypassed these restrictions.Visual Basic builds upon the characteristics of BASIC. There are no line numbers as in earlier BASIC, code is grouped into subroutines or methods: Sub...End Sub . ll editions from Windows 98 to Windows 7 (some editions of Windows 7 do not include it). A Windows 95 machine would however require inclusion with the installer of whichever DLL was needed by the program. Visual Basic 5 and 6 can compile code to either native or P-Code but in either case the runtime is still required for built in functions and forms management. Criticisms levelled at Visual Basic editions prior to VB.NET include: Versioning problems associated with various runtime DLLs, known as "DLL hell" Poor support for object-oriented programming[32] Can only create multi-threaded applications using ActiveX Variant types have a greater performance and storage "overhead" than strongly typed programming languages Dependency on complex and fragile Component Object Model (COM) Registry entries. Legacy development and support All versions of the Visual Basic development environment from 1.0 to 6.0 were retired by Microsoft by 2008, and are therefore no longer supported. The associated runtime environments are also unsupported, except for the Visual

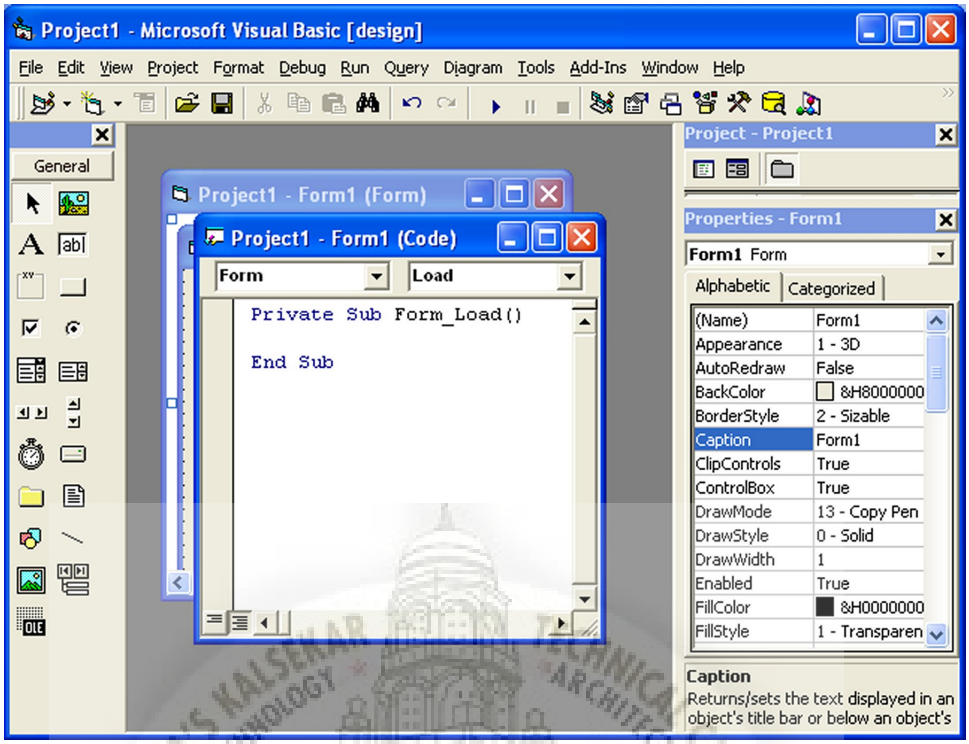

Figure 5.2: Visual Basic

Basic 6 core runtime environment, which Microsoft officially supports for the lifetime of Windows 8 and Windows 10. Third party components that shipped with Visual Studio 6.0 are not included in this support statement. Some legacy Visual Basic components may still work on newer platforms, despite being unsupported by Microsoft and other vendors. Documentation for Visual Basic 6.0, its application programming interface and tools is best covered in the last MSDN release before Visual Studio.NET 2002. Later releases of MSDN focused on .NET development and had significant parts of the Visual Basic 6.0 programming documentation removed as the language evolved, and support for older code ended. Although vendor support for Visual Basic 6 has ended, and the product has never been supported on the latest versions of Windows, key parts of the environment still work on newer platforms. It is possible to get a subset of the development environment working on 32-bit and 64-bit versions of Windows Vista, Windows 7, Windows 8, and Windows 10.

Database tables: Oracle is the backend of the project and this project has 8 tables. The tables are: users : This is to store users of the software

- supplier : This is to store supplier details.
- stock : This is to store stock details
- retailer: This stores retailer records.
- sales mast : This is the master table which contains sales details.
- sales child : This table stores sales details.
- pur mast : This is the master table which contains purchase details.
- pur child : This table stores purchase details.

Earlier versions of Visual Basic (prior to version 5) compiled the code to P-Code only. The P-Code is interpreted by the language runtime. The benefits of P-Code include portability and smaller binary file sizes, but it usually slows down the execution, since having a runtime adds an additional layer of interpretation. Visual Basic applications require Microsoft Visual Basic runtime MSVBVMxx.DLL, where xx is the relevant version number, either 50 or 60. MSVBVM60.dll comes as standard with Windows in all editions from Windows 98 to Windows 7 (some editions of Windows 7 do not include it). A Windows 95 machine would however require inclusion with the installer of whichever DLL was needed by the program. Visual Basic 5 and 6 can compile code to either native or P-Code but in either case the runtime is still required for built in functions and forms management.

Chapter 6

Proposed Method

6.1 Overview

On the display, the time table of SE,TE,BE will be displayed eg: if its 8:15 then timetable of 8:15-9:15 will be displayed red and if the lecturer enters the class then the display colour will change from Red to Green.The total number of students in the class will also be displayed on the display and the attendance will be taken with help of the camera by face detection which will be entered into the ERP.

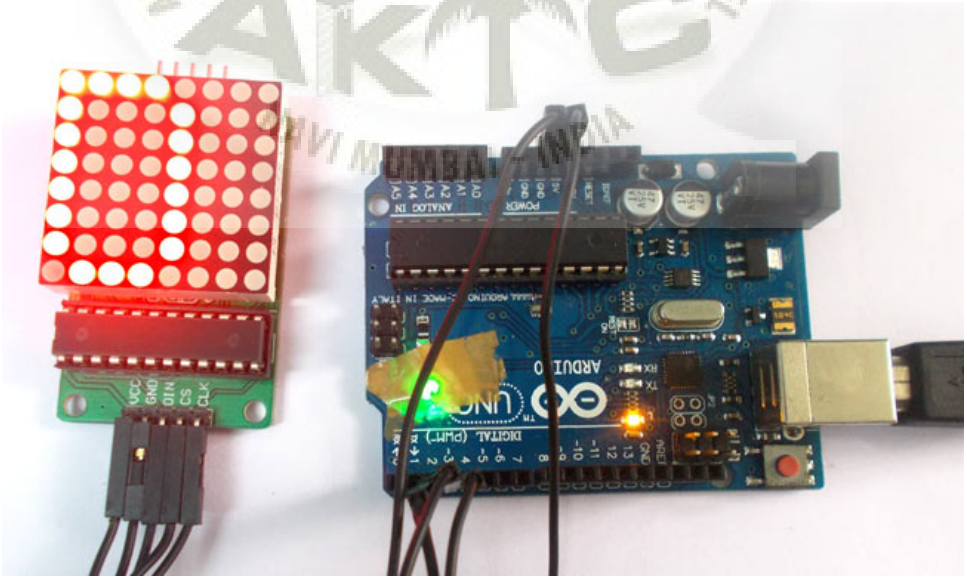

Figure 6.1: Interfacing LED with Arduino

6.2 Design Methodlogy

The component we have used are RTC DS1307, IC7219, 8*8 LED matrix (single colour) LED display RGB, finger sensor etc.RTC is connected to the arduino to provide the real time to the arduino.RTC works on 12C protocol.[2] It has SCL SDA pin. In 12C during data exchange information; the data line must remain stable whenever the clock line is high. Changes in the data line while the clock line is high will be interpreted as control signal. 1st device identification code is sent from arduino controller to DS1307 and the register address to determine the device. 2nd there is change in state of data line from high to low, while the clock line is high is start signal. 3rd the data is sent after the start signal. The state of the data line represents valid data. After a START condition, the data line is stable for the duration of the high period of the clock signal. The data on the line must be changed during the low period of clock signal.[3] There is one clock pulse per bit of data. Each data transfer is initiated with a START condition and terminated with a STOP conditions is not limited, and is determined by the master device.

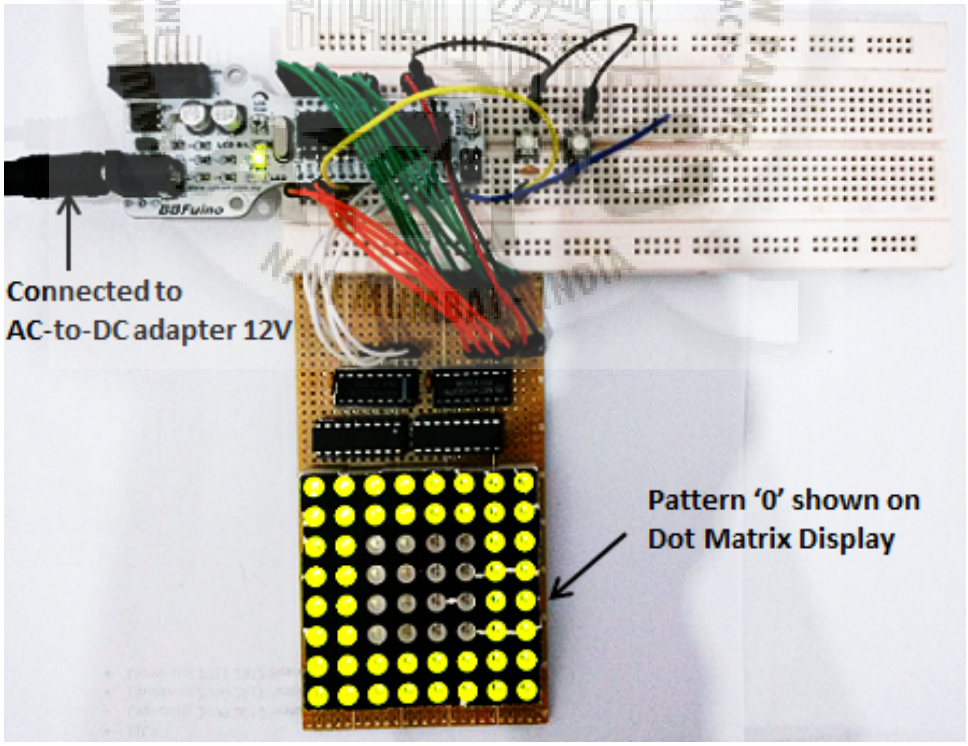

Figure 6.2: Interfacing LED with Arduino

When controller feed the date, day, month, time in RTC then it get store in the register of the RTC and then whenever controller class the RTC by sending the address then after address get matches it sends the START signal and then request for the data then RTC sends the data which contain date ,day, month and time to the controller. The data of RTC stored in registers of controller. Controller displays the current time on the LED display. It sends the data to IC7219. When controller sends the data to the IC7219,Its synchronise with the clock signal and at the time data is send the CS/LOAD signal is kept low. The CS/LOAD is set high concurrently or after the 16th data rising edge of the clock but before the next clock or else the data gets lost. Data at DIN pin is propagated through the shift register and appears at DOUT 16.5 clock cycles later. Data is clocked out on the falling edge of clock. The controller signals are controlled directly by the LED matrix library file in arduino. Then after one minute again the controller RTC for data of time and date and after getting the data it fed the time data to the IC7219. As well as three LED matrix are connected (RGB) are connected to the driver to display the timetable of different class which are going on. And at the entrance of every class there is finger sensor installed by which controller gets to know the lecturer have entered the class or not and this is updated in the database as well as the colour of timetable on LED display of that class gets changed. The time when lecturer enters the class and comes out of the class is saved in the data base. The GUI is made so that staff can update the new changed timetable. When the lecturer remains absent and if other lecturer comes and takes the lecture it is updated on the display by sensing which lecturer have scanned his finger on sensor and change in lecture gets updated on their mobile.For students android app is been made through which students comes to know about the change of the lecture.[5,6].When the lecture finishes, the lecturer presses the button of attendance and then the controller commands the camera to get start and the camera gets start which scans the faces of the students. It takes 8 grids(eyes, ears, nose, chin, forehead, eyebrow,etc). Using MATLAB the image processing is done and attendance of students is updated on the ERP.using PHP language ,we have created database which stores information about the lectures and the faculty conducting it. If the lecturer is absent and in place of it any other lecturer is taking the lecture then that information is also updated. At the end of

Figure 6.3: Interfacing LED with Finger Print Sensor

the month calculations will be made which will show number of lectures taken by each faculty. For implementing this we are using arduino RTC DS1307, IC7219, 8*8 LED matrix (single colour) LED display RGB, finger sensor . The time when the lecturer enters the class and comes out of the class is saved in the database. The GUI is made so that staff can update the new changed timetable. For students, android app is been made through which they come to know about the change of the lecture. Face detection is used for taking attendance and this image processing is done using MATLAB.

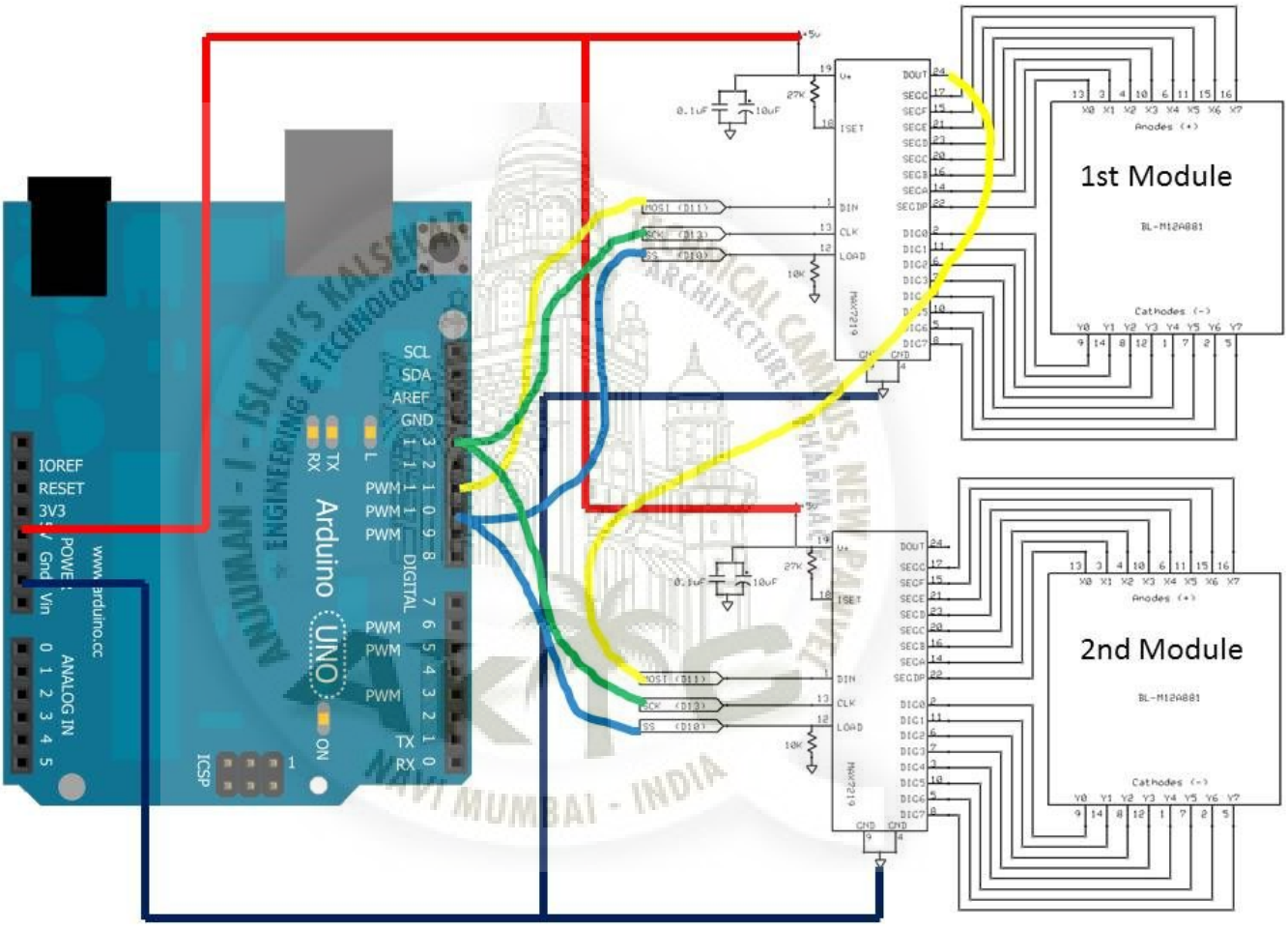

Figure 6.4: Interfacing IC7219 with Arduino

Chapter 7

Result and Discussion

In this innovation the attendance of both teacher and student is recorded. At the entrance setup is done which provide information about the strength of the students attending the lecture and if the lecturer is taking the lecture or not. This idea ensures timely conduction of lectures which enhances the working of the system.The timetable gets displayed on display and changes as soon as the guide mark their attendance and the attendance of the class while entering the lecture is taken. By developing this system we have changed the system of institute.The class will not be a simple class it will be a digital class.All system is automated.Students are unable to do fake attendance because everything is recorded.

Chapter 8

Conclusion and Futurescope

The project is useful for easy user interface.The system utilizes the powerful database management, data retrieval and data manipulation. This project provides more ease for managing the data than manually maintaining the documents.This project ensures punctual start of lectures and prevent devastation of time. Monitorised and secured data of all the activity prevents any ill act done by the students. Therefore uniformity is achieved and balance is maintained over the timetable management system. This helps in improving students academics which is very beneficial.

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Appendix A

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