The British College
KATHMANDU

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Award name: BSc (Hons) Computing

Module code:

Module name: Production Project

Module run:

Coursework title:

Due Date:

Module leader: (In LBU)

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Contents

Abstract: -

Home security framework is profoundly ideal for home as well as anyplace security issues are required. This security is incorporated for Home/Bank/Office and with the end goal of safety; everybody needs to take appropriate measures to anticipate interruption. Presently days, interloper can take points of interest to take any illicit wor and can brutal any essential security issues. Keypad bolted framework is fundamental for anchoring any home or foundations. In this paper, I have present the plan nd advancement of reasonable expense and legitimate power utilization with secret p se which ensures home security framework.

Introduction: -

Today, innovation has turned into a coordinated piece of individuals' lives. It has, and keeps on affecting numerous parts of day by day life and has permitted better social cooperation, simplicity of transportation, the capacity to enjoy excitement and media and has helped in the advancement in medication. The making of numerous gadgets, for example, cell phones and PCs have made numerous individuals depend on innovation to speak with their companions, store data, for example, pictures, motion pictures, records, and music. Cell phones have enabled individuals to interface with the web without the requirement for a PC, while as yet offering a similar usefulness yet through various methods. With the presentation of better equipment and better programming, cell phones have turned out to be ground-breaking gadgets and have turned into a vital piece of individuals' day by day lives. A noteworthy perspective is the manner by which the cell phone can associate and speak with different gadgets. For instance, cell phones can be utilized as a mouse for a PC, or it can associate with the speakers of auto enabling buyers to play their own music. There are numerous utilizations of this sort. A field that is as of late picking up prominence is home computerization which can likewise utilize cell phones as data or usefulness centers.

Smart Door lock is the protected, basic and simple to deal with our home's lock. This bolt needs no keys and the bolt is connected inside the door and we can control it from outside the door utilizing Bluetooth. As the bolt is inside the door there is no real way to break the door by a criminal. An android application is required to open and close the bolt and I will clarify the subtle elements how we can build such an android application. A secret key is sent to the bolt utilizing the android application and the secret key is matched then it is coordinated to our preset-lock secret word and the lock will be open and sent an input to your telephone like the lock is open. The remote task is accomplished by any cell phone/Tablet and so forth., with Android OS, upon a GUI (Graphical User Interface) based touch screen activity.

So as to expand the security dimension of basic region and information, a framework, which is called "Smart door Locking System", was created. The framework was intended to remotely open the entryway utilizing a cell phone and to give get to just to the approved work force. It depends on a couple of key parts: Bluetooth-radio correspondence, sequential correspondence, GUI checking framework and implanted framework. There are utilized two HC-05 Bluetooth-to-UART modules, one of which is associated with the implanted framework which controls the bolt, another is associated with the sequential port of the host PC, so as to get the information and to appear all the required data about the work force as indicated by that information. The implanted framework comprises of the Atmega32L microcontroller, a couple of transistor, a solenoid, which opens the entryway. The another piece of the framework is versatile application. Each approved individual from the user will have an extraordinary versatile application introduced on his portable gadget. Just this application will have the capacity to speak with the installed framework, in light of the fact that there was produced an exceptional information organize for this correspondence. On the off chance that an individual isn't a piece of the client, the

application is erased from his gadget. So as to keep the application duplicating and subsequently give get to unapproved individuals, the application was created cell phone subordinate.

There are a couple of fundamental advantages of the framework. Right off the bat, it is extremely secure:

unapproved individuals won't have any probability to access the lab. Besides, there is no requirement for the key – the main thing which will be required is a enlisted cell phone with the required programming.

Objectives: -

Smart Door automation application has as of late progressed toward becoming standard is the capacity to control entryway locks utilizing cell phone application or through the (web application). This undertaking expects to build up a model of an item equipped for locking/opening an entryway, with an accentuation on minimal cost and open source configurability. The ultimate objective past this venture would be an item that would ideally enable individuals to interface with numerous other home gadgets through cell phone and Bluetooth.

Literature and review: -

Right when people consider home modernization, a huge segment of them may envision of living in a superb home: One remote controller for every family machine, cooking the rice normally, starting air circulation and cooling framework therefore, warming water for shower normally and shading the window thus when night coming. To some degree home computerization reciprocals to splendid home. They both bring out canny living condition and make our life more supportive and speedy. In today's condition technology has made a huge success towards the people's lives. It has started to affect the daily life of the living beings in many aspects such as for a better social interaction, ease of transportation including the entertainment, media and also in the field of medicine. By creating the smart devices such as smart phones people rely on technology for the communication purpose, to store data such as document, videos, songs and pictures. Technology such as Internet has given the people the ability to retrieve the data, store the data in many formats for the better management of the data. From the invention of the internet, smart phone users have dramatically increased becoming one of the best medium for the communication.

Smart phones are gaining more popularity among the people because of its functionality. Through the help of smart phone, we can directly do our work without opening personal computer. It has become important part in people's lives. For example, smart phone can be utilized as a wireless mouse in a computer, speakers of the cars can be instructed from the smart phones for allowing to play their own song. There are many applications of these type. In recent times a field that is achieving the popularity is home automation which can be used through smart phones for information and other functionality purposes. Home computerization [illegible] mechanical autonomy is a blend of robotization advancements and software engineering. High moderateness and availability through cell phones and tablets has expanded the predominance of home mechanization as of late. The existence nature of the elderly and incapacitated can be enhanced by utilizing home mechanization. [illegible] recurrence [illegible] one of the strategies utilized in the home computerization system to control and screen home machines. Home computerization comprises of electronic programmable controls for home machines utilizing wired or remote correspondence. A keen home controller interfaces the whole house in a home mechanization framework. These demonstrations like an incorporated control of family frameworks, for example, sprinkler units and inside temperature screens. With this control [illegible] control unit, an individual does not have to leave the love seat to turn on/off home apparatuses which is advantageous for clients. Home computerization is intended to acquaint accommodation and proficiency with a home. Individuals living with physical impediment may depend on the highlights of a home computerization framework to achieve unremarkable errands that may somehow or another be troublesome or unthinkable.

According to review there exists numerous such frameworks that could control entryway. Every framework has its own one of a kind element. Following model depicts the work performed in undertaking. Arduino UNO itself go about as a microcontroller. Plan and execution of low, smart and continuous checking and controlling of entryway security

utilizing Arduino. Arduino alongside HC-05 and portable Applications enables us to control entryway from anywhere in the home and always keep watch on it. Some framework gives security alert utilizing low processor chip. R-Pi would trade information or would speak with the assistance of Bluetooth, Wi-Fi and Ethernet. These frameworks have them possess weaknesses. For instance, framework actualizing must require Wi-Fi/Ethernet for the information correspondence. These frameworks too capable for home mechanization.

Review of foreign studies: -

In their paper, Tan, Lee and Soh (2002) proposed the development of an Internet-based system to allow monitoring of important process variables from a distributed control system (DCS). This paper proposes hardware and software design considerations which enable the user to access the process variables on the DCS, remotely and effectively.

Potamitis, Georgila, Fakotakis, and Kokkinakis, G. (2003) suggested the use of speech to interact remotely with the home appliances to perform a particular action on behalf of the user. The approach is inclined for people with disability to perform real-life operations at home by directing appliances through speech. Voice separation strategy is selected to take appropriate decision in speech recognition.

In the year 2006, S. M. Anamul Haque, S. M. Kamruzzaman and Md. Ashraful Islam proposed a system titled "A System for Smart-Home Control of Appliances Based on Time and Speech Interaction" that controls the home appliances using the personal computer. This system is developed by using the Visual Basic 6.0 as programming language and Microsoft voice engine tools for speech recognition purpose. Appliances can be either controlled by timer or by voice command.

Ciubotaru-Petrescu, Chiciudean, Cioarga, and Stanescu (2006) present a design and implementation of SMS based control for monitoring systems. The paper has three modules involving sensing unit for monitoring the complex applications. A processing unit, that is microcontroller and a communication module that uses GPRS modem or cell phone via serial port RS-232. The SMS is used for status reporting such as power failure.

Jawarkar, Ahmed, Ladhake, and Thakare (2008) propose remote monitoring through mobile phone involving the use of spoken commands. The spoken commands are

generated and sent in the form of text SMS to the control system and then the microcontroller on the basis of SMS takes a decision of a particular task. Prof. Era Johri Dept. Of Information and Technology K.J. Somaiya College of Engineering VIDYAVIHAR, MUMBAI “Remote Controlled Home Automation Using Android Application via Wi-Fi Connectivity”.

Home mechanization or keen homes can be depicted as presentation of innovation inside the home condition to give accommodation, solace, security and vitality proficiency to its tenants. There are numerous different tasks done on home robotization in various nations. They are all not quite the same as one another in plan highlights, gadgets, components and calculation. They were structured by explicit necessities and accessibility of segments in the individual regions. Some of them are shoddy; some of them are over the top expensive. Accessibility of both equipment and programming is important to work. After a long seeking, we have discovered a ton of articles hunting down security reason articles, we additionally discovered a few ventures improved the situation carport security. These are for the most part done in western nations. Numerous undertakings are done just for security reason with Arduino or Raspberry Pi. Once more, the ventures are done just to control home machines utilizing Arduino or Raspberry Pi. There are few activities on Fingerprint acknowledgment module for solid home security issues. One of the activities utilized biometric strategy for cutting edge E-international ID. The e-identification, as it is now anyplace in the world called, speaks to a striking activity in the arrangement of two new advancements: Radio-Frequency Identification (RFID) and biometrics. Moreover, there are ventures done on unique finger impression acknowledgment module depicting the strategies how to recognize the fingerprints. A wide assortment of frameworks requires solid individual acknowledgment plans to either affirm or decide the character of an individual asking their administrations. The reason for such plans is to guarantee that the rendered administrations are gotten to just by a genuine client and nobody else. Those papers didn't make reference to about how to use it for home security utilizing any sort of microcontrollers. Face acknowledgment is another great and shrewd way that home security need. We have discovered activities for entryway security utilizing face acknowledgment utilizing Raspberry Pi. We stayed away from this part for the security reason since blunder happens more in face acknowledgment than unique mark acknowledgment. Unique mark has high exactness. They didn't expressly specify the home security reason or Raspberry Pi. They have just referenced about the strategies of acknowledgment. Distinctive individuals have depicted the method of acknowledgment in various ways. Fundamentally every one of them have attempted to limit blunders for PC to perceive confront.

Three scientists of Malaysia proposed an online indoor air quality framework with GSM and Arduino. The framework comprises of gas sensor, temperature and stickiness sensor, molecule dust sensor and remote sensor organize (WSN) hub as a remote transmitter. A work area PC goes about as the base station.

As indicated by Chen Shih-Chung, the frameworks proposed by him is planned that can be effectively be adjusted for different applications, for example, control of machines in machining businesses, car industry, exploring portable remote hubs, robotizing workplaces and so on. There are few home computerization frameworks that utilization ZigBee or Bluetooth for the remote association. With the assistance of Wi-Fi and because of the presentation of IPv6 the association of relatively boundless number of implanted gadgets is conceivable.

In Bangladesh, IPv4 is used. Isa Elina and Sklavos Nicolas proposed cameras and sensors inputs put together framework works with respect to distinctive dimensions of client's entrance control, in light of passwords arrangements. The framework works through SMS correspondence by means of the accessible GSM organize. Asim Ali and Al-Rousan displayed a structure and actualized Java based mechanization framework through World Wide Web. It has an independent implanted framework board incorporated into a PC-based server at home. Andrew, the creator of the book "Raspberry Pi Home Automation with Arduino", presented Raspberry Pi and tools to utilize it for home mechanization. He depicted the utilization of Raspberry Pi with Arduino for Linux working framework. The book depicts some home apparatuses programmed control. First he depicted how to introduce all the fundamental hardware what not required conditions. Right off the bat, he gave the historical backdrop of Arduino and Raspberry Pi with all attachments, required shield particularly and every essential port with power supply. We had the capacity to discover essential information of Arduino since were utilized it. Genuine instances of the entryway opening also, shutting of blind dependent on light and temperature information are given. Once again, he didn't demonstrate any precedent identified with security of home.

Annan Zhu, Peijie Lin and Shuying Cheng of Fuzhou University of China portrayed the remote control arrangement of home machines utilizing android telephone through GSM organize (2012 Universal Conference on Control Engineering and Communication Technology). They concentrated on the plan of Android terminal, the correspondence among ARM and GSM module. Limiting the trouble in providing the suitable low-voltage DC power MCU and remote module by a solitary live wire was additionally one of the undertakings. Here we have discovered just the controlling of apparatuses utilizing android, simply that.

An article of Singapore by the writers Thomas Gonnot, Won-Jae Yi, Ehsan Monsef and Jafar Saniie demonstrated a convention standard for home computerization framework called Home Automation Gadget Protocol (HADP). Wi-Fi, Bluetooth 4.2, ZigBee IP, 6LoWPAN, IEEE 802.15.4 gauges, and Ethernet arrange layer supporting IPv6 convention were their segments. For the most part they proposed a convention in the

event that this that. So it associated numerous gadgets together utilizing WIFI association.

K. M. Abubeker, Jose J Edathala, Shinto Sebastian from India presented PIR sensors and an shrewd power sparing mode in ATM counter. This uses pyro-electric infrared sensors to recognize people on foot and the ATM clients. The framework is controlled by the ongoing clock RTC DS 1307 to separate the day and evening time with an observation video. This gives an fantastic security to the ATM counter.

As indicated by an article by Suresh, J. Bhavya, S. Sakshi, utilizing PIR sensor with Arduino Mega is a shoddy and viable security framework that can advise around a gatecrasher through content message. In India, individuals generally depend on close to home security protect for home security. Same goes for Bangladesh. They made this less demanding and less expensive than exorbitant reconnaissance video cameras.

Once more, there is another article to avoid robbery in home by P. Satya Ravi Teja, V. Kushal, A. SaiSrikar titled "Photosensitive security framework for burglary discovery and control utilizing GSM innovation". They used it utilizing LDR (Light Dependent Resistor) based sensor which goes about as an electronic eye for identifying the burglary or endeavor, and a flagging method dependent on SMS utilizing GSM (Global Systems for Mobile interchanges) innovation. It is additionally cum shabby.

These are the couple of past examines done on comparable subject. It is referenced before that most of them need either the security framework or the controlling framework. We maintained a strategic distance from the face acknowledgment framework for home security since individuals are endeavoring to limit a great deal of blunder in acknowledgment of face, one must be at a specific edge with the goal that the PC can perceive. In this manner unique finger impression acknowledgment module is increasingly solid for entryway security. A few of these undertakings are finished with Arduino, some of them are finished with Raspberry Pi. The parts, similar to sensors and shields make use of various models. Our point is to consolidate those frameworks together i.e. controlling home apparatuses and security framework with Arduino keeping it as cheap as could be allowed.

Review of Technologies: -

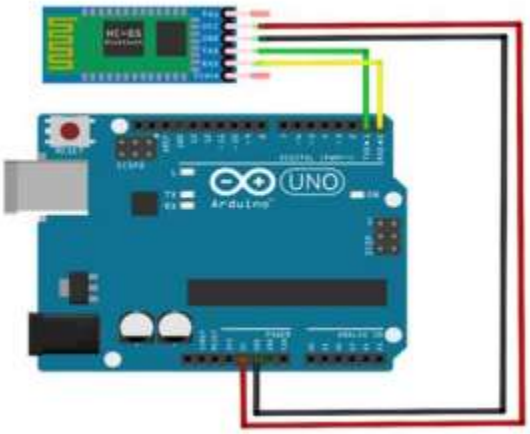
The tools and technologies that are required for developing this system are as follows: -

- Arduino UNO
- Bluetooth module HC-05
- Servo Motor
- Female input and male input wires
- IDE Software's
- MIT App Inventor

Brief Introduction to these tools and technologies are as follows: -

Arduino UNO: -

It is an open-source stage utilized for building gadgets ventures. Arduino comprises of both a physical programmable circuit board (regularly alluded to as microcontroller) and a piece of programming, or IDE (Integrated Development Environment) that keeps running on your PC, used to compose and transfer PC code to the physical board. Arduino UNO is known as the 'stock' Arduino. It is effortlessly versatile to all programming gadgets. All other Arduino sheets are distinct variants of the UNO board. It has all highlights resemble Arduino MEGA with less stuffs.



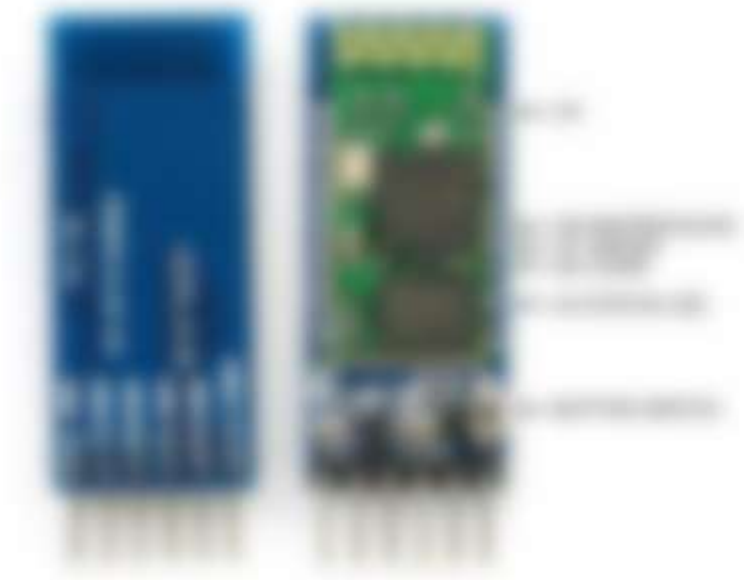
Arduino UNO connected to the Bluetooth HC-05 module.

Throughout the years Arduino has been the cerebrum of thousands of ventures, from regular articles to complex logical instruments. An overall network of creators - understudies, specialists, craftsmen, software engineers, and experts - has accumulated around this open-source stage, their commitments have signified a staggering measure of available information that can be of extraordinary help to beginners and specialists alike.

Arduino was conceived at the Ivrea Interaction Design Institute as a simple device for quick prototyping, went for understudies without a foundation in hardware and programming. When it achieved a more extensive network, the Arduino board began changing to adjust to new needs and difficulties, separating its offer from basic 8-bit sheets to items for IOT applications, wearable, 3D printing, and installed situations. All Arduino sheets are totally open-source, engaging clients to fabricate them freely and in the long run adjust them to their specific needs. The product, as well, is open-source, and it is becoming through the commitments of clients around the world.

Bluetooth module HC-05: -

Bluetooth module is an outstanding module, most accessible and most recent remote sequential link. This module is a simple SPP (Serial Port Protocol) module. This module comprises of Bluetooth V2.0+EDR (Enhanced Data Rate) 3 Mbps Modulation with 2.4GHz radio handset and baseband. It utilizes CMOS innovation with CSR Blue center 04 External chip Bluetooth frameworks what's more AFH (Adaptive Frequency Hopping Features). This module gives exchanging mode among accept and slave mode which implies it can't be accepting or transmitting information. HC-05 module is a simple to utilize Bluetooth module, designed for straightforward remote sequential association setup. The HC-05 Bluetooth Module can be utilized in a Master or Slave setup, making it an extraordinary answer for remote correspondence.



HC-05 module with its pin configurations

Hardware functions of HC-05 module: -

Bluetooth takes 1.8V for activity, 3.3 to 5 V I/O. Affectability is normally - 80dBm and UART interfacing with baud rate programmable. Edge connector is additionally present.

Circuit connection of HC-05 module

Software Functionality: -

- Allow matching of baud

Bluetooth module assumes an essential job in interfacing the home apparatuses with the Android telephone yet it has just four pins for association. Stick associations are given below:

Arduino Pins	Bluetooth Pins
RX (PIN 0)	TX
TX (PIN 1)	RX
5V	V_{CC}
GND	GND

HC-05 Pin interface

Servo Motor: -

Servo engines are not really an explicit class of engine but rather are a blend of explicit parts, which happen to incorporate a DC or AC engine, and are appropriate for use in a shut circle control framework. They are utilized in mechanical technology, mechanized assembling and PC numerical control (CNC) machining applications. The servo engine is a shut circle servomechanism that utilizes position input so as to control its rotational speed and position. The control flag is the information, either simple or computerized, which speaks to the last position ordered for the pole. A kind of encoder fills in as a sensor, giving rate and position input. As a rule, just the position is accounted for. The last position is accounted for to the controller and this is contrasted with the underlying position info, and afterward if there is an error, the engine is moved so as to get to the right position.

The least difficult servo engines use DC engines and position detecting through a potentiometer and furthermore utilize enormous detonation control, which implies that the engine moves at most extreme speed until the point that it stops at the assigned position or is halted. This isn't broadly utilized in modern movement control as it tends to be very mistaken, yet these sorts of servo engines are prominent in radio-controlled gadgets, for example, show air ship and toy vehicles. Refined servo engines for mechanical use have both position and speed detecting and additionally actualize relative fundamental subordinate control calculations, enabling the engine to be conveyed to its position rapidly and decisively without overshooting, as the speed of the pole can likewise be controlled.

Servo Motor

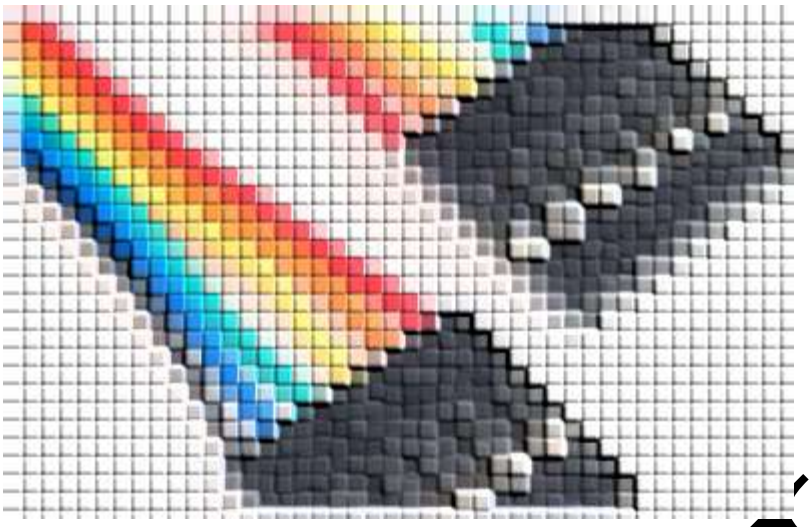
All engines have three wires leaving them. Out of which two will be utilized for Supply (positive and negative) and one will be utilized for the flag that will be sent from the MCU.

Servo engine is controlled by PWM (Pulse Width Modulation) which is given by the control wires. There is a base heartbeat, a most extreme heartbeat and a reiteration rate. Servo engine can divert 90 degrees from either bearing. Structure its nonpartisan position. The servo engine hopes to see a heartbeat each 20 milliseconds (MS) and the length of the beat will decide how far the engine turns. For instance, a 1.5ms heartbeat will make the engine swing to the 90° position, for example, if beat is shorter than 1.5ms shaft moves to 0° and on the off chance that it is longer than 1.5ms than it will turn the servo to 180°.

Servo engine takes a shot at PWM (Pulse width tweak) rule, implies its edge of revolution is controlled by the term of connected heartbeat to its Control PIN. Fundamentally servo engine is comprised of DC engine which is controlled by a variable resistor (potentiometer) and a few apparatuses. Fast power of DC engine is changed over into torque by Gears. We realize that WORK= FORCE X DISTANCE, in DC engine Force is less and remove (speed) is high and in Servo, compel is High and separation is less. Potentiometer is associated with the yield shaft of the Servo, to ascertain the point and stop the engine on required edge.

Female input and male input wires: -

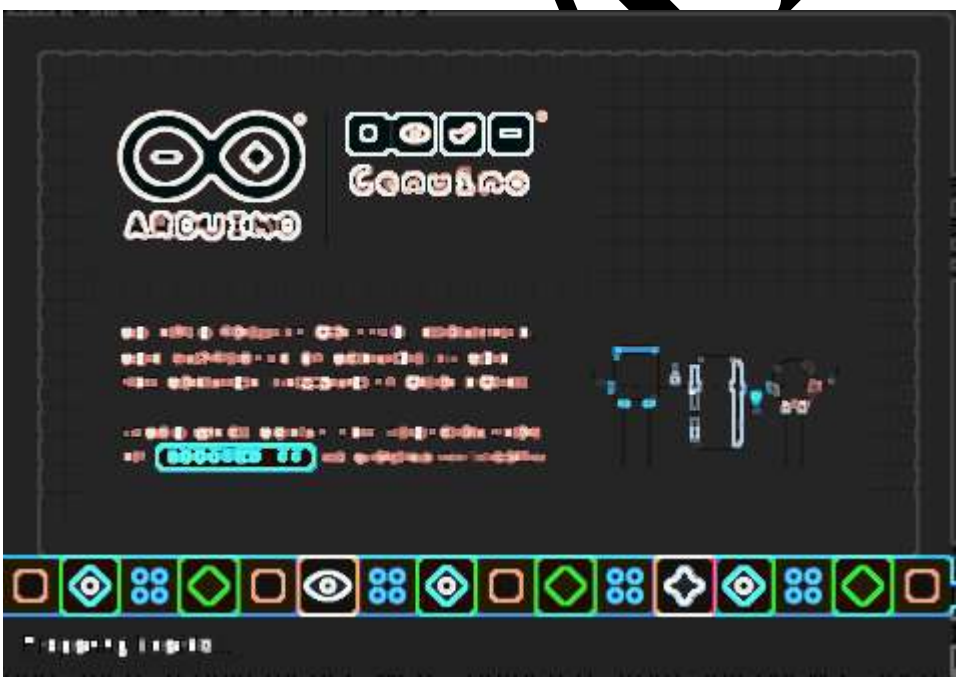
Links made to associate with these stick headers are typically one of two sorts: singular wires with pleat connectors on them or strip links with protection relocation connectors. These can basically be braced onto the finish of a lace link, which makes an association with every last one of the conductors in the strip link. For the most part, links are just accessible as female sex and anticipate that a male stick should mate with.



Cables to connect Arduino and other tools

IDE Software: -

Arduino comprises of both a physical programmable circuit board (frequently alluded to as a microcontroller) and a bit of programming or IDE (Integrated Advancement Environment) that keeps running on your PC, used to compose and transfer PC code to the physical board.



IDE Startup

MIT App Inventor: -

Application Inventor for Android is an open-source web application initially given by Google, furthermore, presently kept up by the Massachusetts Establishment of Technology (MIT). It enables newcomers to PC programming to make programming applications for the Android working framework (OS). It utilizes a graphical interface, fundamentally the same as Scratch and the Star Logo TNG UI, which permits clients to move visual articles to make an application that can keep running on Android gadgets. In making App Inventor, Google drew upon critical earlier research in instructive processing, and also work done inside Google on online improvement conditions.

Methodology: -

For this project water fall method has been used. Due to the time constraint water fall method is used. Home automation project takes more time for its development. In this water fall method we go through step wise procedure. Firstly, feasibility studies were taken out and then requirements were gathered from interviews, focus groups, Questionnaire. Then after I analyzed the gathered information and designed the system through various diagrams. Water fall method is mainly used for this project because my project is based on object based and real world scenario. This method is easy to understand for the customers and it doesn't overlap between the phases. A field visit was carried out during this project. I went to governmental, commercial offices and residential areas and collected their opinions and information about my project. Many of the big commercial offices have already implemented the smart door locking system some of the governmental offices also are interested in this kind of project. In case of residential houses people nowadays they are living with the technology so they loved my project. Due to the security problem and easy of use most of the offices and residential area wanted to implement my project. This is 21st century where technology, automation system is widely growing day by day. Also, Research has been done through the internet. In internet people are searching such kinds of technology which saves energy, which is easy to use, remotely useable and secures their homes.

As appeared by the proposed framework, we have planned the framework structure appeared in the square outline. We have structured the model so that it very well may be kept at a protected place inside the house. All programming and parts establishment are done and tried inside the research facility and in home. There are a great deal of parts and wires that we have utilized for the framework. This is done in the most straightforward and least cost conceivable. Be that as it may, the framework is adaptable what's more, can be altered by the client. Transforming one of the parts setup must be good with the correct programming accessible. Each segment utilized in this framework was modified and tried independently for wellbeing measures and coordinating with the correct driver. Every part was modified independently with both Arduino Mega and Arduino UNO utilizing

diverse Arduino IDE. Likewise, they were kept running in various PCs. Later on all were joined in a solitary Arduino IDE. It is preposterous to expect to run the framework without the Wi-Fi and PC.

At first, we have to associate cell phone to framework utilizing the application which we made on MIT APP designer. when associated we will have the capacity to bolt or open entryway utilizing the parchment arch in the application. on the off chance that we move slider to open position then the application will send specific incentive to Bluetooth module and after that servo engine will pivot with certain degree so that the entryway will be opened. The ultrasonic sensor will be put in the door jamb thus will be Light Dependent Resistor on which the laser light will continuously fall. If somebody opens the entryway then the separation among entryway and ultrasonic sensor will increment and furthermore the laser light which was falling on LDR will likewise be catted because of which ldr will give expansive esteem, if this both condition occurs (i.e. with ultrasonic sensor and ldr) at that point can say that the entryway is opened and we can see the status of entryway on screen. on the off chance that we endeavor to close the bolt utilizing application when entryway is open then we will get the notice saying that we first need to close entryway so as to bolt it. We can give this application to our relatives and other login certifications with them so they can likewise be ready to bolt and open the entryway.

Analysis Specification: -

At first, to build up a framework we should have knowledge about what the framework is all about. The reason for the investigation is to discover the practical and non-useful prerequisite which distinguishes and organize the data needs which underpins the framework exercises to achieve framework objectives. Analysis is vital in light of the fact that it enables us to expand propel understanding into the business structure to help ensuing difference in the information designing. It empowers feeling of obligation with respect to the systems made to meet undertaking wide destinations and objectives.

The method that I have utilized as a part of this project is object oriented procedure. I have picked this strategy since it encourages the diminishment of support, code reusability, certifiable displaying and furthermore enhances unwavering quality and adaptability.

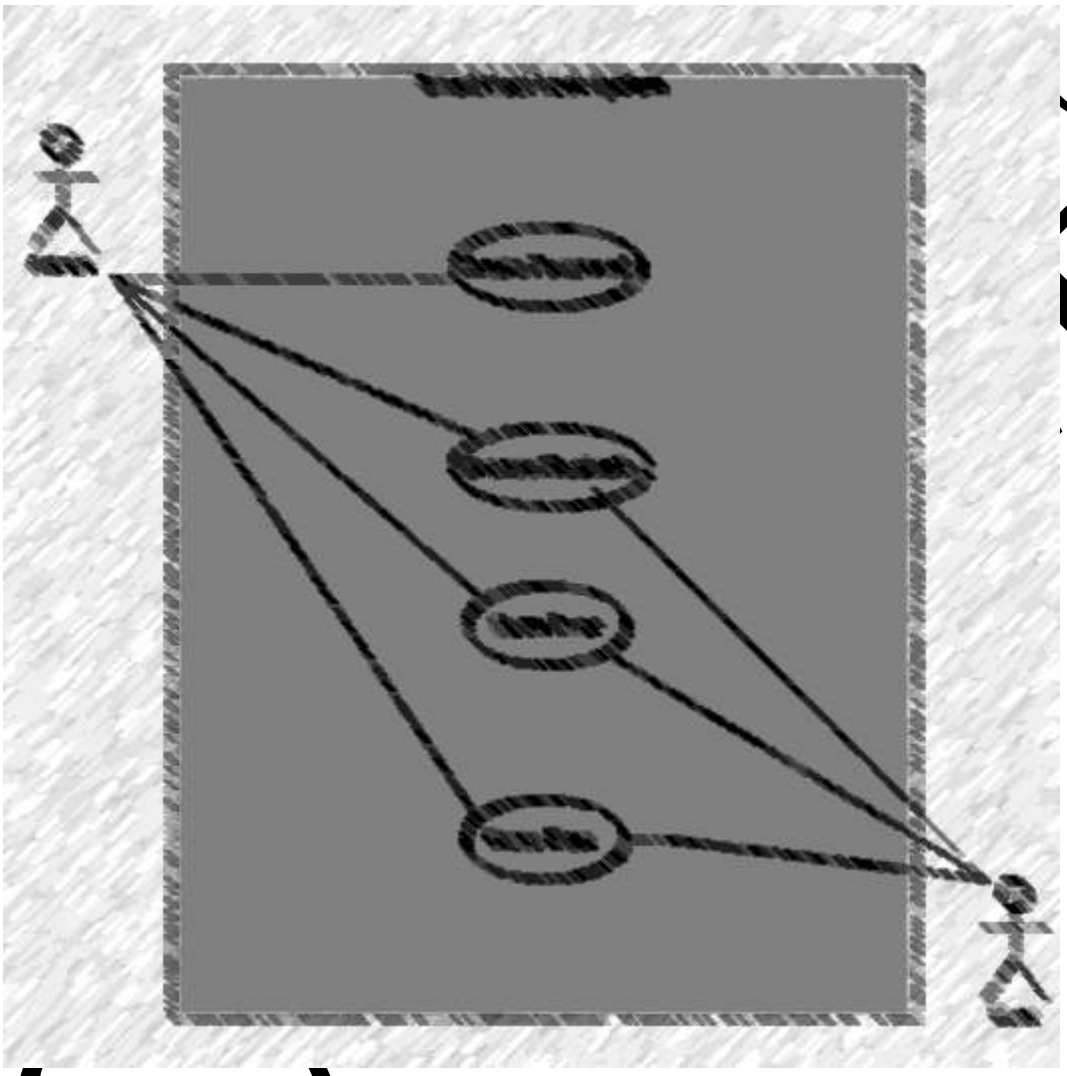
Diagram, for example, use case diagram is utilized as a part of this analysis stage. While doing investigation we do feasibility study/possibility studies, questionnaires', meetings and center gathering.

Feasibility study is imperative to inspect different locales including minute components of the current software system, the limits and objectives of the system, who are the people and the inspirations for the present system for example inconsistencies/inadequacies in helpfulness or implementation, trying to find any possible course of action decisions and the purposes of intrigue and weights of the decisions. Some of the ways for feasibility study are: -

- Economic
- Legal
- Methodical
- Operation
- Timetable

Use Case Diagram: -

Use –Case Diagram illustrates the ongoing process of the system. Basically it has an actor, cases and system. It displays the connection of the actors and the cases in the system.



Use case diagram of smart door locking system

Requirement Specification: -

Interviews: -

Interviews is the slightest requesting yet best fra[illegible]orks available for social affair prerequisites. Meeting depends on custom[illegible] to custo[illegible]r correspo[illegible]dence. For our framework, Smart Door Lock System [illegible]eeting [illegible]ught to [illegible] taken among the house owners, government officials, staff[illegible] compa[illegible]s, techni[illegible], specialized staffs of the intermediary association to as[illegible]ble the data tha[illegible] are required for the necessities of the framework.

Some of the Research question[illegible] a[illegible]

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[illegible]co[illegible]s smar[illegible]k

Focus Group: -

focus group is d[illegible]ne in small groups, anyway demographically extraordinary social [illegible]on[illegible] people whose reactions are inspected especially in measurable reviewing o[illegible] political analysis in guided or open exchanges about another item or something [illegible]se to choose the reactions that can be typical from a greater populace. focus[illegible]oup is otherwise called subjective research concentrating on a gathering of individuals and talking them getting some data about their acknowledgments, sentiments, feelings, and attitudes towards an item, advantage, thought, notice, or bundling. Request are done in a clever social occasion setting where individuals are permitted to chat with other get-together people. For our system, Smart Door Lock System person who work for the association, purchaser, technicians and

builder’s real estate company heads government officials ought to be engaged as per the prerequisites of the system

Functional Requirement: -

Portraying conduct of the framework precisely as the necessities of the client in the framework is known as useful necessities. It should describe what the framework will do. Practical prerequisites are finished and are described in the framework plan.

Non-Functional Requirements: -

Nonfunctional Requirements describe framework attributes, for instance, safety, faithful feature, performance, viability, flexibility, and convenience. They fill in as objectives or confinements on the arrangement of the frameworks.

Prioritization: -

Prioritization is for making ... se of which requirements of an item thing ought to be joined into a particular re...ease. Ne...ties are moreover sorted out to limit chance amid improvement which p...oritize the most essential requirement to be implemented.

In this project I have u...lized Moscow technique.

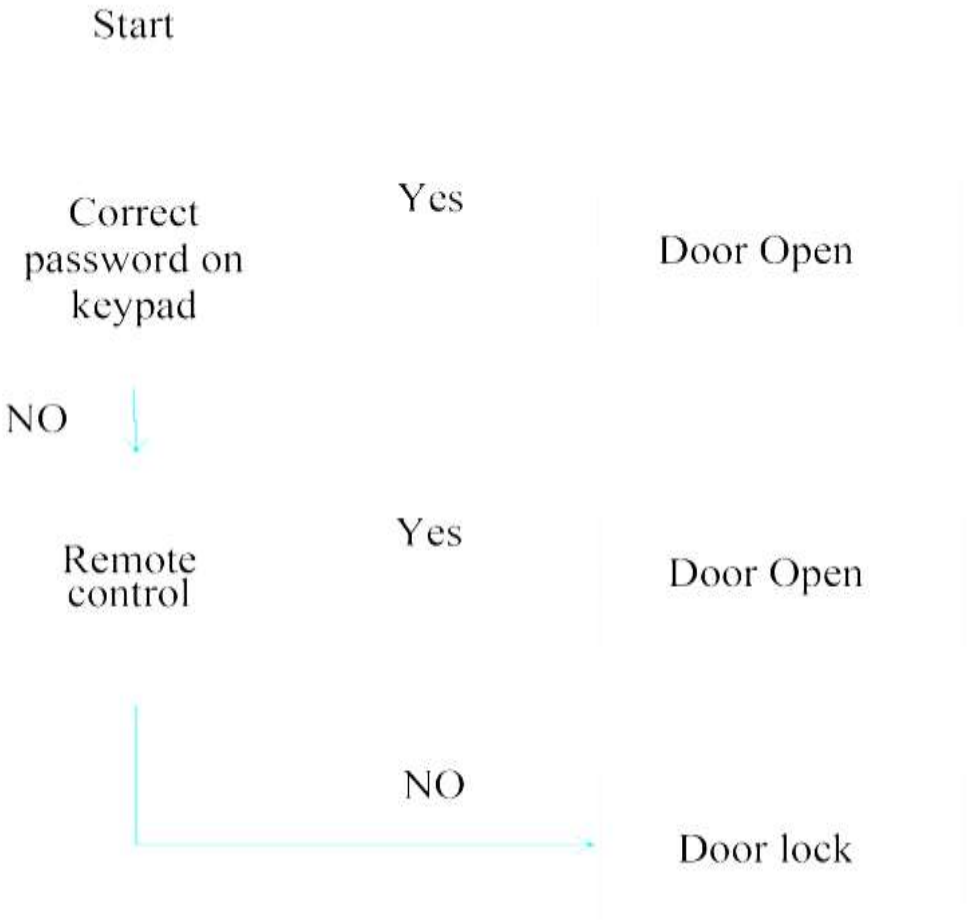
Functional Requirement Prioritization: -

Non-Functional Requirement Prioritization: -

Design Specification: -

Outline Specification is the most essential part in the field of change process. Outline Specification indicates how the item system executes the basics which are depicted in the practical necessities. It displays the system execution require portrayed in the investigation stage. Plan Specification combines on testing particular need or components of the system. Plan Specification show models, charts which help us with determining the structure of the system and what sort of system will be made. In like way, it likewise tracks each and every bugs in the structure with the objective that it lessens the bugs that can happen later on. It in like way affirms all the fundamental part and necessities that are fulfilled or not. Likewise, it helps the client by guaranteeing that each and every need is met or not. Software that I have used to develop this model is Visual Paradigm.

For this project I have displayed the steps involved in the design process in flow chart. The flow chart is given below: -



Flow chart

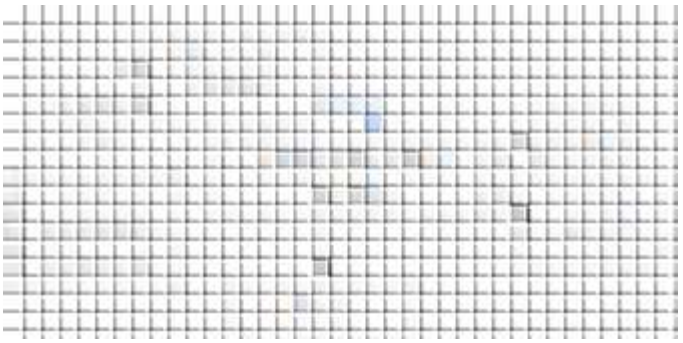


Figure above demonstrates the square outline of the robotized entryway security framework utilizing Android application. The android application was intended to initially show menu to enter secret phrase before the menu of the direction of either open or shutting will show up if the correct secret phrase was entered. The application can be introduced on any android telephone to control an equipment area introduced on an entryway that controls the locking or opening and the controlling shutting or opening of the entryway where it is introduced.

The Android application based entryway Security System comprises of an android application that can be introduced on android telephones. The android application was planned utilizing android studio (A coordinated advancement condition Android Studio was introduced which is then used to plan the application with the assistance of java advancement pack (JDK) and programming advancement pack (SDK)). The Android stage incorporates bolstering the Bluetooth organize stack, which permits a gadget to

is associated with the Arduino Uno that controls the locking or opening activity of the entryway. The opening or shutting of the entryway frames the equipment of the security entryway locking framework. On the off chance that the privilege secret phrase is entered the menu for opening and shutting will pop up, however in the event that a wrong secret phrase is entered the menu for opening furthermore, shutting won't fly down. The whole task of the equipment area of

the venture is focused on the Arduino Uno that has been customized. Upon power ON the fluid precious stone show (LCD), instates its program by showing "Welcome to Door

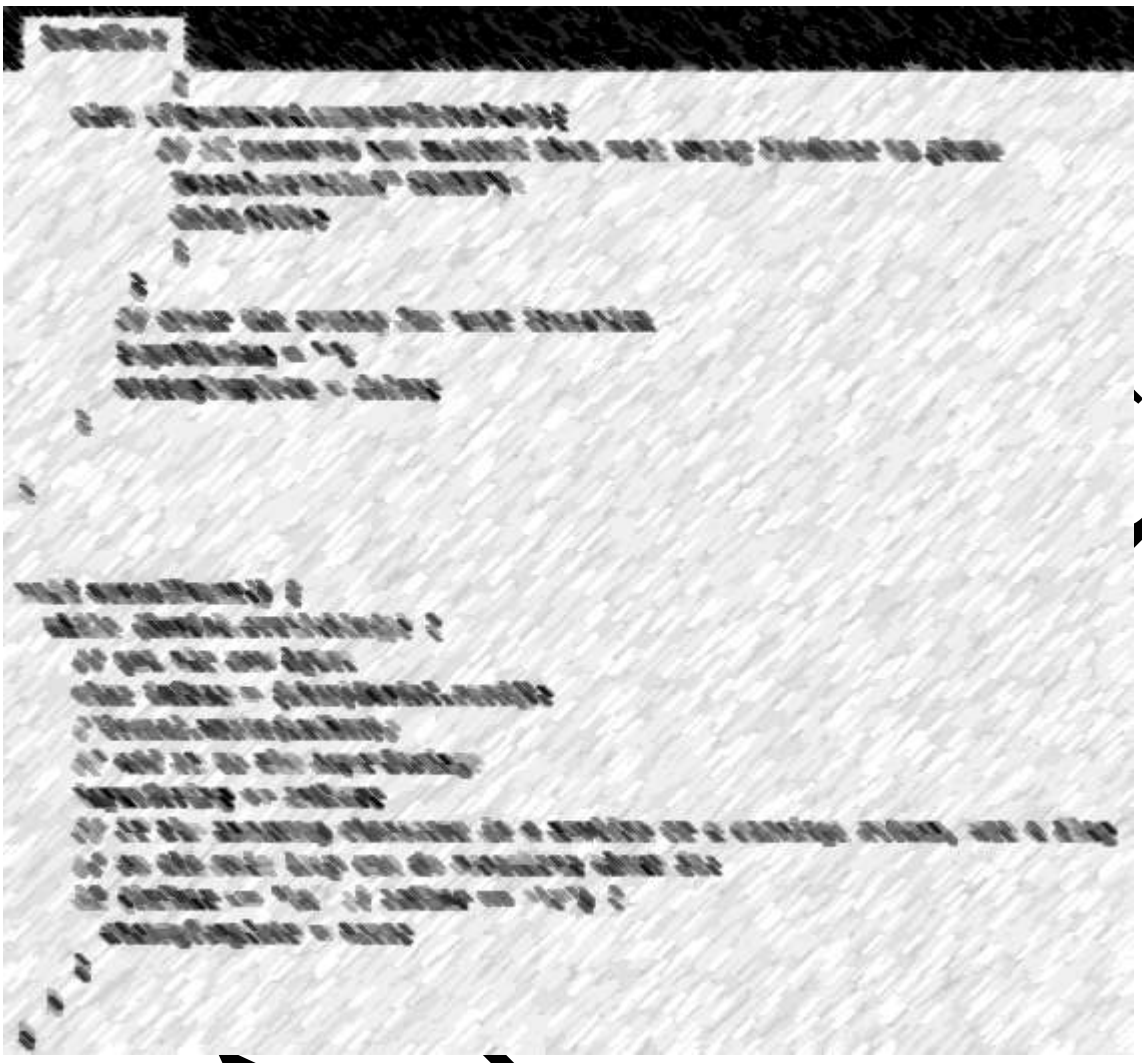
A standard servo is equipped for turning some place around120-1[illegible]degrees in the clockwise and counter clockwise headings. The servomotor is utilized for th[illegible]ening and shutting of the entryway while transfer is utilized f[illegible]he locking and ope[illegible]g of the entryway.

Implementation: -

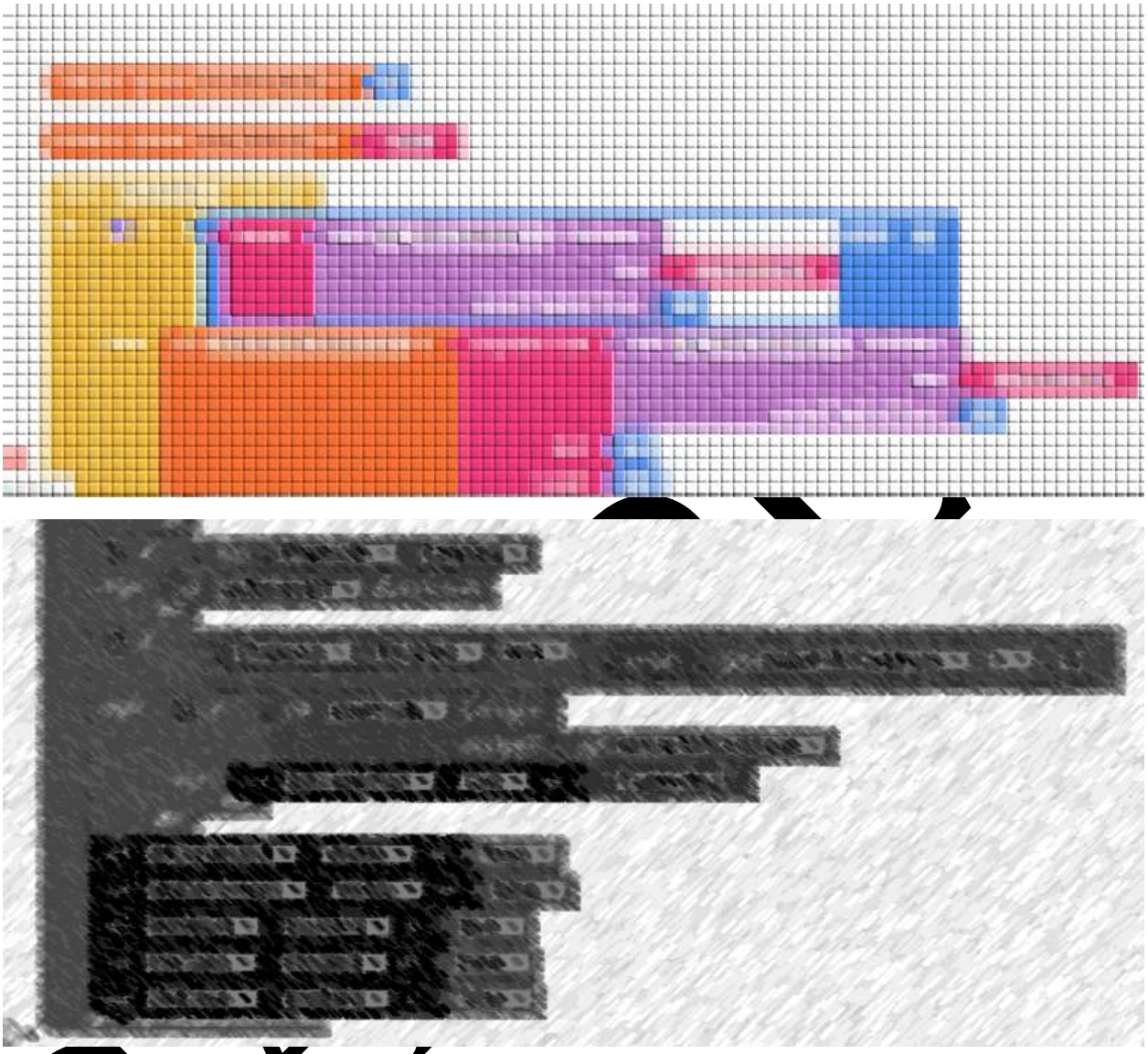
While Implementation process the design that we have developed until now should be executed by different means. For the current system I have implemented the design by good coding practice. Investigation, designs done during the other process has been implemented in this implementation session. Implementation is one of the main part of while developing a software system. After the implementation process the software system can be deployed. Hence the development of the system has been started.

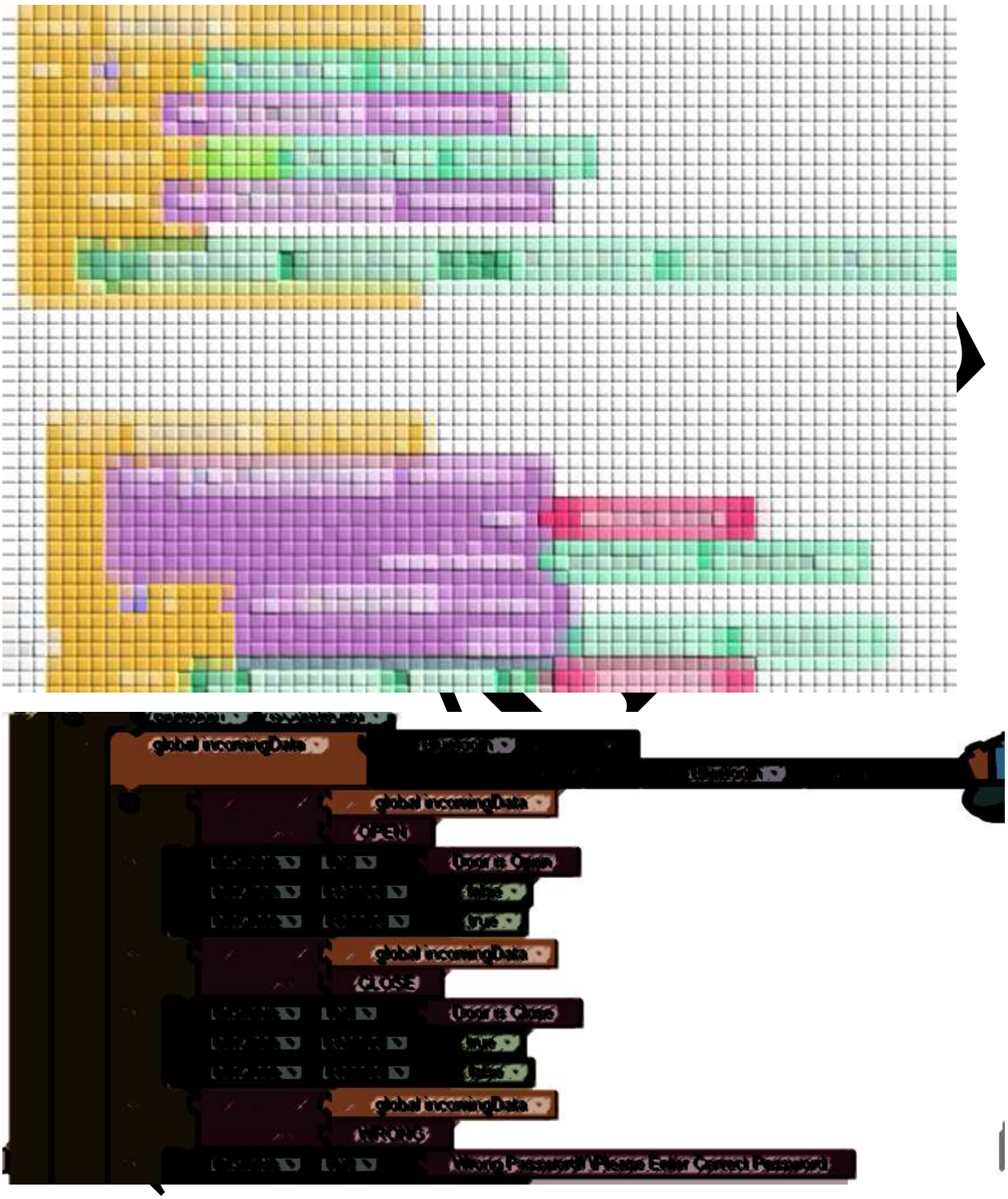
The program for the Arduino Uno microcontroller was written in C dialect and was then incorporated into an executable record utilizing the Arduino IDE. The executable record was straightaway imported into the Proteus Design Suite IDE, where the equipment circuit was structured and reenacted. It demonstrates the introduced android application on a Samsung J7 telephone. It demonstrates the Proteus reenactment of the entryway security framework results for each procedure of entering the right and wrong passwords separately. Upon effective fruition of the product reproduction, the framework's equipment was developed on a bread board and programming of the Arduino microcontroller was done utilizing Arduino IDE. The equipment development with associations and different tasks of the framework demonstrates the connection of the equipment of the security entryway when speaking with the application.

Some of the source code of the Arduino Uno are as follows: -



Some of the Source code of the MIT App inventor are as follows: -




global incomingData
global incomingData
Door is Open
global incomingData
Door is Close
global incomingData

Programming Language: -

Language that are developed for the machine and human readable mainly for the development of the software or program is known as programming language. In programming language different datatype qualities are listed as String, numeric representation by integer, float and many other. Without these languages we cannot cooperate with the machines or the pc's for developing the software system. There is various advance programming language that interacts while the machine level hardware system and helps the software system to be developed. Some of the programming language are python, ruby, C#, php and many more. For the development of this system I have used C# programming language.

Development Environment: -

Various ways, methods and tools have can be used while developing, designing the software system. As my project is based on real world scenario I also need to build software and also the code programming in the micro-controller. For my project I have used following tools: -

Project Evaluation: -

Checking the status of overall smart door lock circuit, next is to open the mobile app BT control on my smart phone. With the app open it has button (Pair Device) to pair the available Bluetooth devices, button (Connected) to show the status of Bluetooth device connected, button (Disconnect) to disconnect the device, password to access smart lock and open door and close door buttons to open and close door. And the final status field to show the current status of the smart lock. First the smartphone was connecting to the HC-05 device by providing necessary pin code. With successful connection to HC-05 Bluetooth device the MAC-Address of the HC-05 Bluetooth is shown otherwise nothing is shown.

The password was provided to the password field enabling the Open Door button whilst the Close Door button is in disabled state. With clicking the Open Door button the smart lock opened door and the Open Door button was in disabled and Close Door button was enabled, also the Door is open message is displayed in the app. With Exit App button the App Closed successfully.

Whenever wrong pin code while connecting to Bluetooth HC-05 was provided connection to the device was failed and no access to smart lock is granted. With successfully paring with HC-05 device and wrong password provided the Wrong Password message is displayed to the user via the app.

Hence in overall the project have work as expected and the experiment against the smart lock is successful, with not allowing accessing to smart lock without pin code for HC-05 device and actual pin code of smart lock. Hence from the experiment carried out it proved that is no by passing option for authentication thus compromising the security of the system.

Conclusion: -

Till the prototype of the Smart Door lock system I have learnt many things from this project. This project was fruit full for me. Many additional works are left such as more functionality in the software system and also in the project. I have analyzed some of the data for this project and then I drew a model to illustrate it and identify it more minutely. At last I implemented the code and added a micro-controller, Bluetooth for the working phase. Hence the prototype has been developed successfully.

From the venture completed, we discover the framework adequately minimal effort and easy to understand. The entire house stays under the client's control constantly. In future we may discover a few gadgets that are increasingly solid, quicker and less expensive. We have attempted to make a decent controlling what's more, security framework. The segments that we have utilized can be changed with the most recent gadget be that as it may, it ought to have the correct programming and the correct driver. Every one of the errands of this task are done effectively. We had the capacity to satisfy our objectives as proposed in this framework. We had our impediments in time and costs however we trust that it will fill in as premise of other most recent AI frameworks that of western nations. All logical and most recent innovations have both great and terrible sides. That doesn't mean we ought to keep away from innovation. This sort of work motivates us to improve the situation for our nation. Keen Innovation is a gift for our nation. We should attempt to keep away from the terrible results and use it for our advancement. it was found that the task performed as indicated by determinations and can be executed or set up in different places, for example, home, workplaces and modern territories. The Robotized entryway bolt framework can give the security to foundation or associations that utilization the framework. It would thus be able to be reasoned that the underlying targets which we set out to accomplish as expressed in this report has being effectively achieved which were:

Bibliography: -

PROJECTS, M., ELECTRONICS, T., ELECTRICAL, T., AUTOMATION, H., PI, R., ELECTRONICS, P., PROJECTS, A., PROJECTS, M., CIRCUITS, F., PROJECTS, M., TIMER, 5., AMPLIFIERS, O., SYSTEMS, N., DEVICES, I., THEORY, D., CIRCUITS, S., US, C., US, F. and PLUS, G. (2018). *200+ Arduino Projects List For Final Year Students*. [online] Electronics Hub. Available at: https://www.electronicshub.org/arduino-project-ideas/ [Accessed 23 Dec. 2018].

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https://www.slideshare.net/fiyametahabt/information-security-proposal-for-electronic-door-lock

http://www.ijircce.com/upload/2013/august/3_Feasibility.pdf

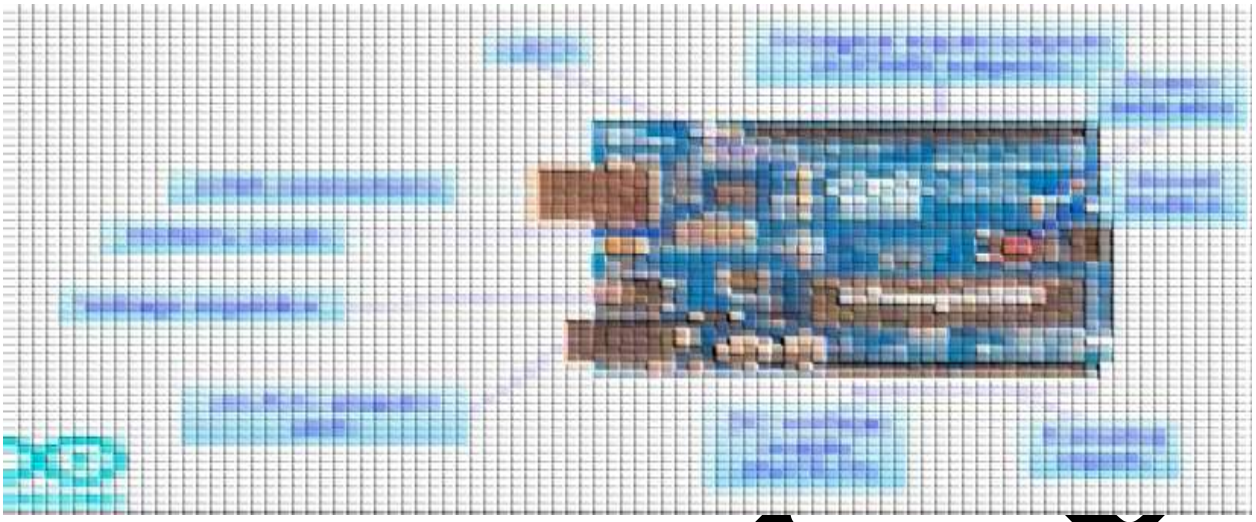
https://www.researchgate.net

Appendices: -

Appendix A: - Design Documents

Block Diagram

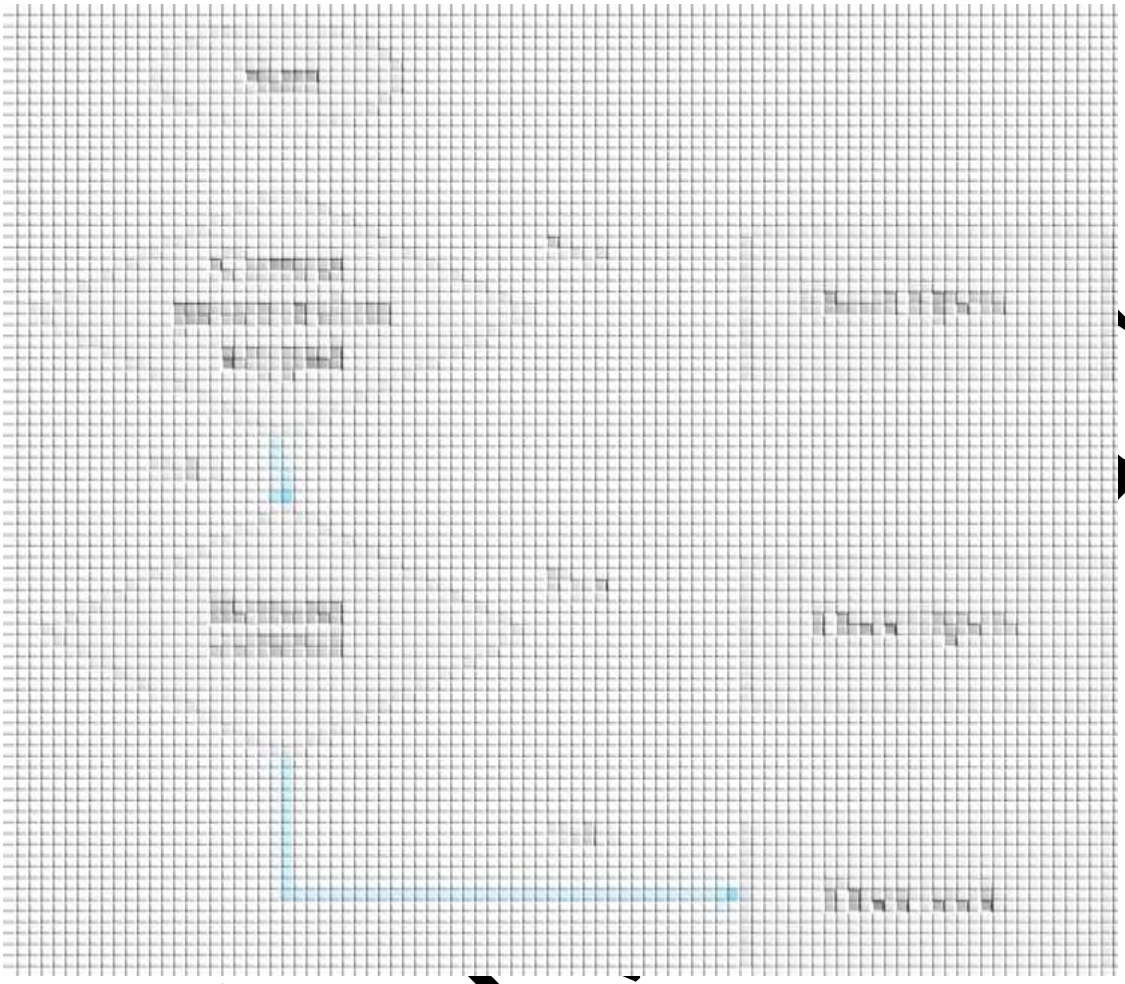
Arduino board: -



Arduino board Specification: -

Use Case Diagram: -

Flow chart: -



Appendix B: - Results of interview and product testing

Appendix C: - Meeting Record Sheets

School of Computing, Creative Technologies and Engineering 2017/18

Level 8 Production Project

MEETING RECORD SHEET : 5	Meeting Number: 5
Student: Siddhartha Neupane	Student I.D.: 7718[illegible]4
Date of Meeting: 20/03/2018	Supervisor: Preethi Upadhyaya

Actions agreed at previous meeting (completed or unresolved):

1	*Requirement analysis should done on basis of hardware and software.*	☑
2	*Feasibility study should be done on basis of operational, time and technical.*	☑
3	*A methodology along with overall system design should be proposed*	☑
4	*A prototype will be developed.*	☑
5	*Discussion on prototype and get feedback.*	

Comments of student (if any):

Some feedback were given by supervisor with regard to prototype. Agreed to do feasibility study on feedbacks given.

ABOVE here – student to complete before Meeting with supervisor. BELOW here – complete at the Meeting.

Next meeting (date/time):

Agreed Actions to complete before next meeting:

1	*Fixed and fill Ethical form correctly.*
2	*Submission of Ethical form.*
3	*Research and perform feasibility study on feedbacks given.*
4	*Improvise the prototype and research on how new features can be incorporated.*
5	*Start writing Final Report and take feedback.*

Comments of supervisor (if any):

.....

School of Computing, Creative Technologies and Engineering 2017/18

Level 6 Production Project	Meeting Number : 6
MEETING RECORD SHEET : 6	Student I.D.: [illegible]
Student : [illegible]	Supervisor : [illegible]
Date of Meeting: [illegible]	

	Actions agreed at previous meeting (completed or uncompleted):	☑
1	Read and fill Ethical form correctly.	☑
2	Submission of Ethical form.	☑
3	Research and perform feasibility study on feedbacks given.	☑
4	Improvise the prototype and research on how new features can be incorporated.	☑
5	Start writing Final Report and take feedback.	

Comments of student (if any):

Feedbacks on report writing was given by supervisor and discussed to alter report where ever necessary before final submission.

ABOVE here – student to complete before Meeting with supervisor. BELOW here – complete at the Meeting.

Next meeting (date/time):

	Agreed Actions to complete before next meeting:
1	Finalized and final touch to Physical implementation.
2	Use appropriate citation and references.
3	Complete Final Report incorporating feedbacks.
4	
5	

Comments of supervisor (if any):

School of Computing, Creative Technologies and Engineering 2017/18

Level 6 Production Project

MEETING RECORD SHEET : 7	**Meeting Number : 7**
Student : Siddhartha Neupane	**Student I.D.: 77193504**
Date of Meeting:13/11/2018	**Supervisor : Pranita Upadhaya**

Actions agreed at previous meeting (completed or comment):

1	*Finalized and final touch to Physical implementation.*	☑
2	*Use appropriate citation and references.*	☑
3	*Complete Final Report incorporating feedbacks.*	☑
4		☑
5		☑

Comments of student (if any):

Final report to be reviewed with peers and make changes if necessary.

***ABOVE here** – student to complete before Meeting with supervisor. **BELOW here** – complete at the Meeting.*

Next meeting (date/time):

Agreed Actions to complete before next meeting:

1	*Complete the Production project and report.*
2	*Prepare slides for both logical and physical implementation of project.*
3	*Future works were defined for feedbacks which were unable to incorporate due to time constraints.*
4	*Re-review final reports from peers and make necessary alterations if necessary.*
5	

Comments of supervisor (if any):

.....

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.....

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.....

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Appendix D: - Risk analysis and Backup plans

Impact= Likelihood * Consequence

Likelihood	Value
Low	1
Medium	2
High	3

Table: Risk likelihood values

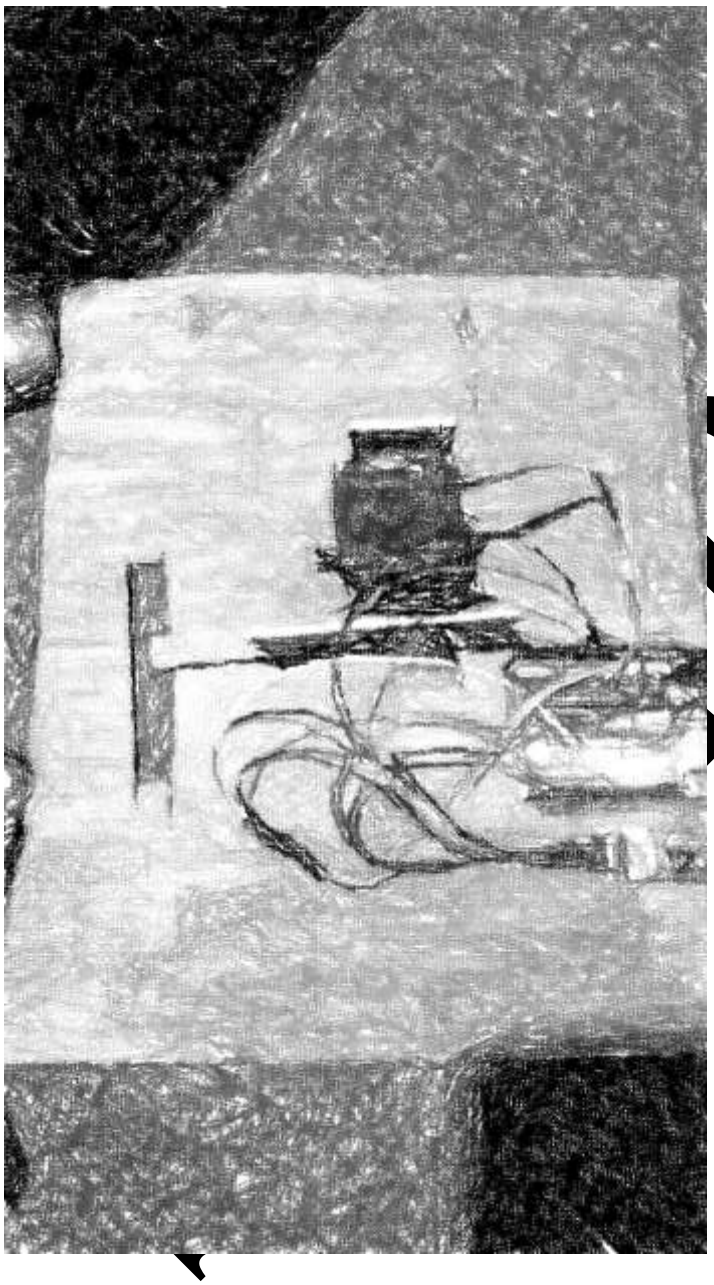
Consequence	Value
Very low	1
Low	2
Medium	3
High	4
Very high	5

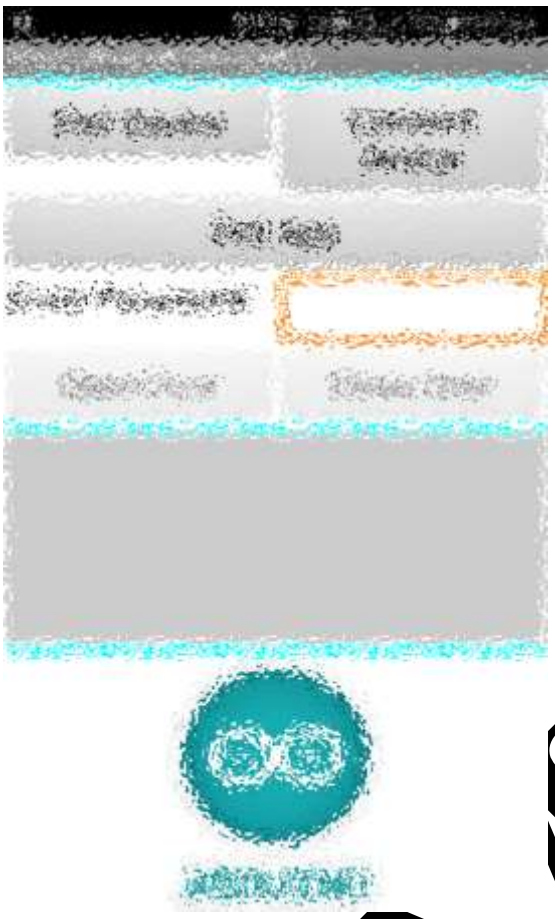
Table: Risk consequence values

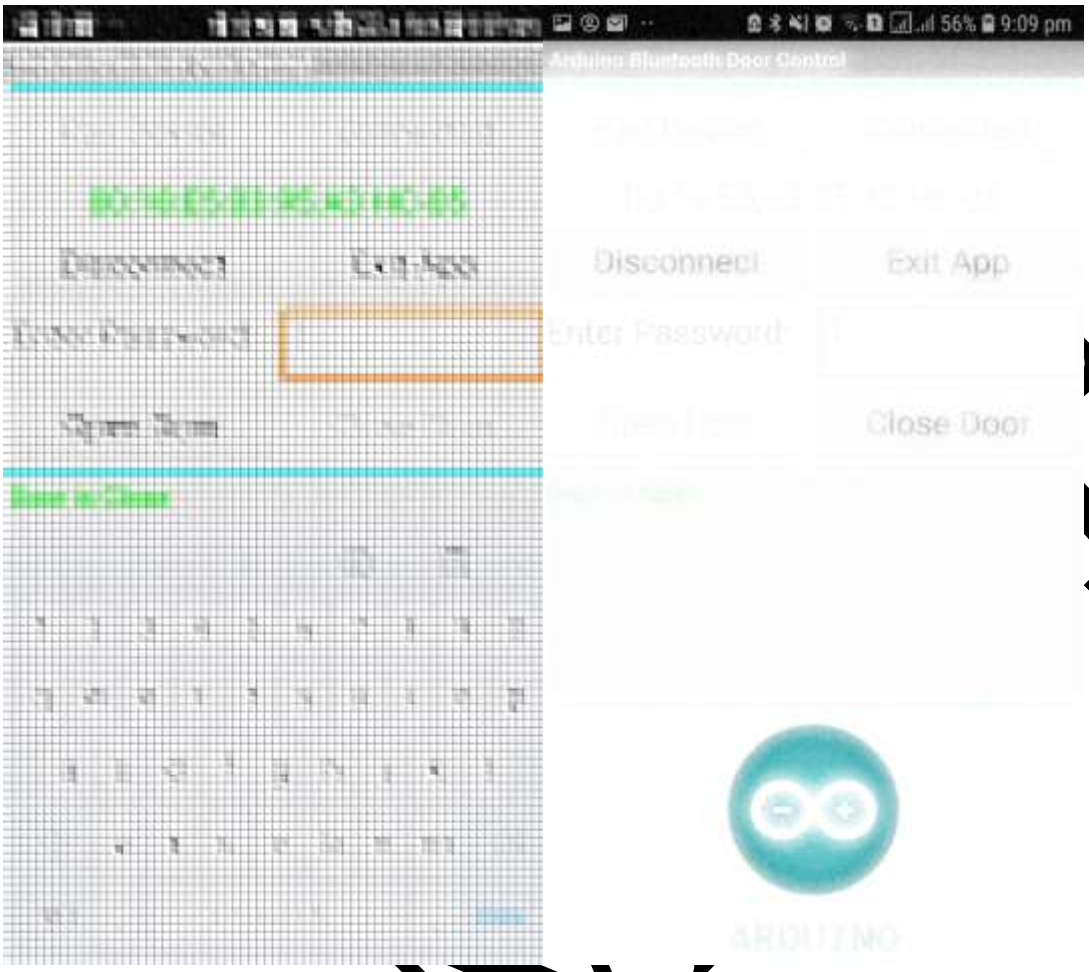
Risk	Likelihood	Consequence	Impact	Action
Error while doing coding	2	4	8	Coding should be done properly
Hard disk crash	2	3	6	Should prepare reliable back up
Natural disaster	1	4	4	Proper back up should be made

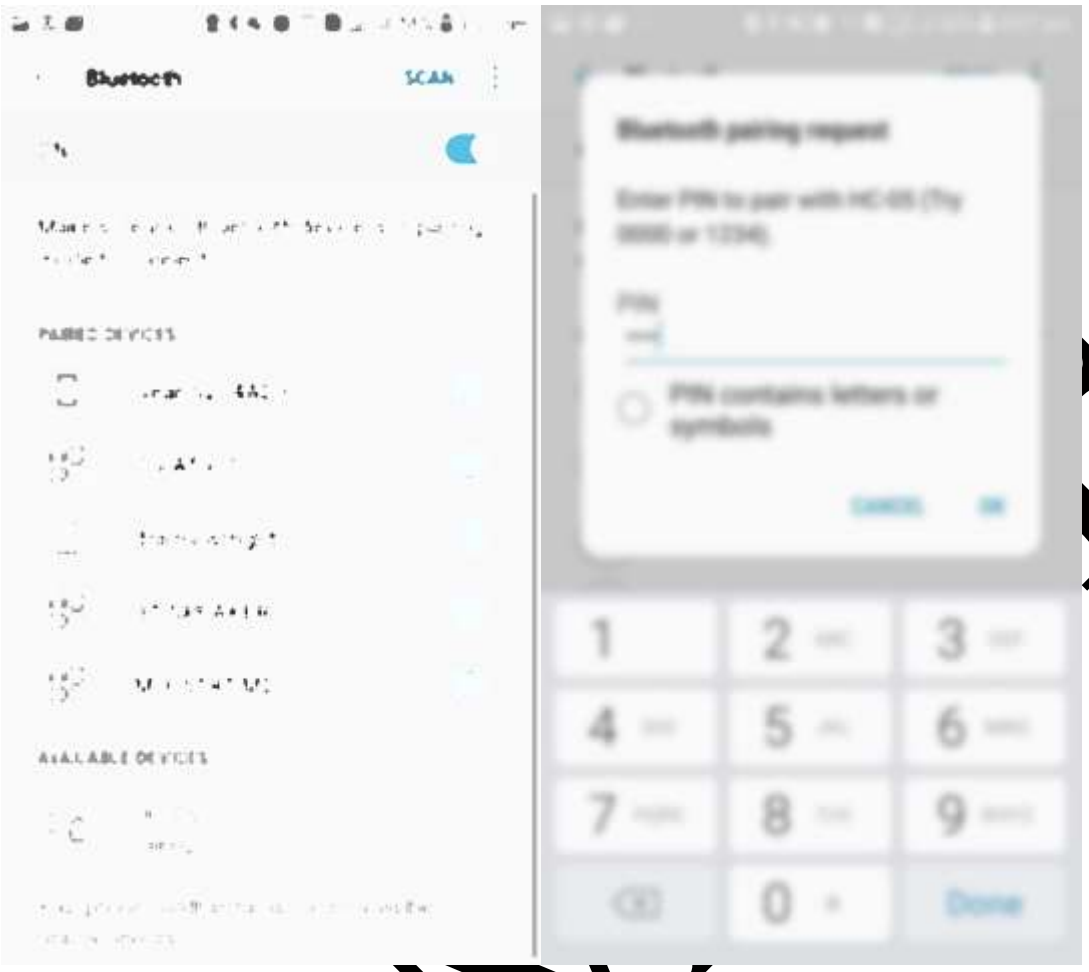
Difficult to operate	1	3	3	Should make user friendly system

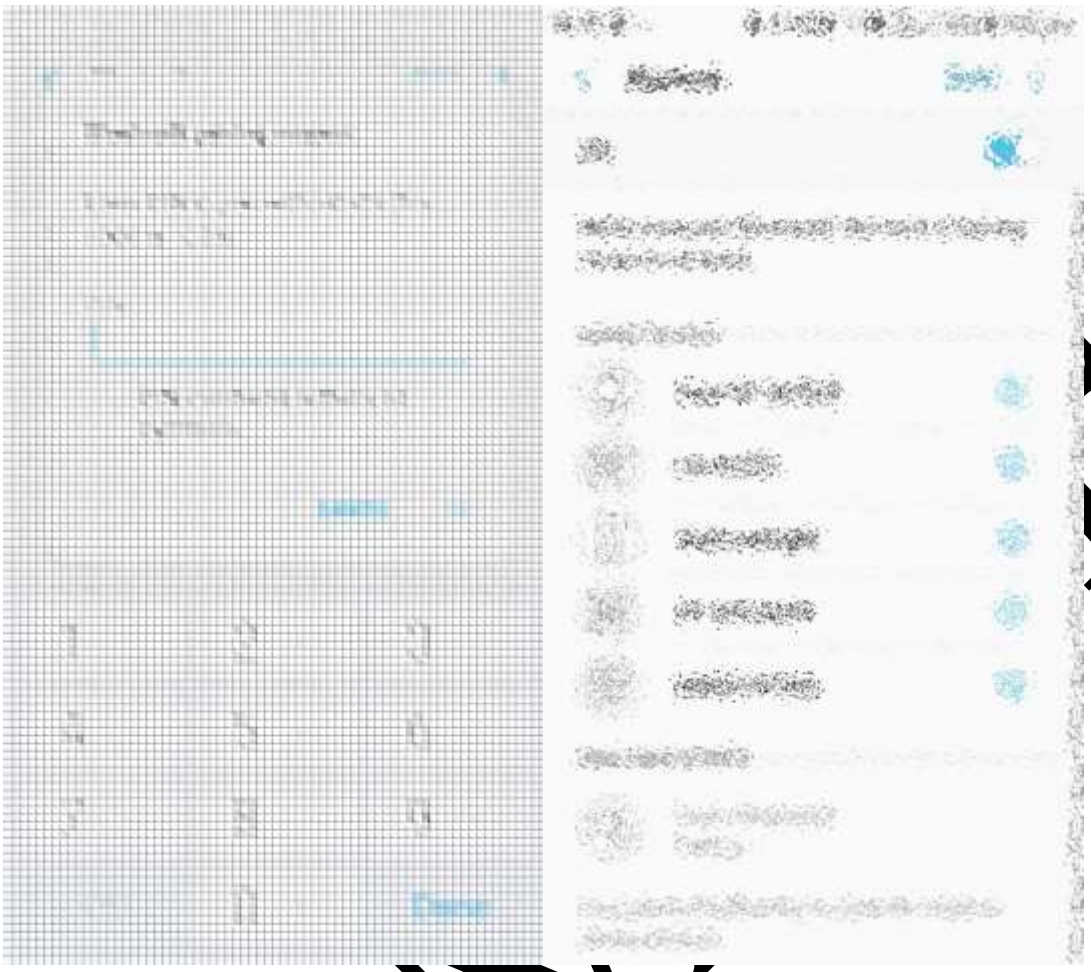
Appendix E: -User Guide

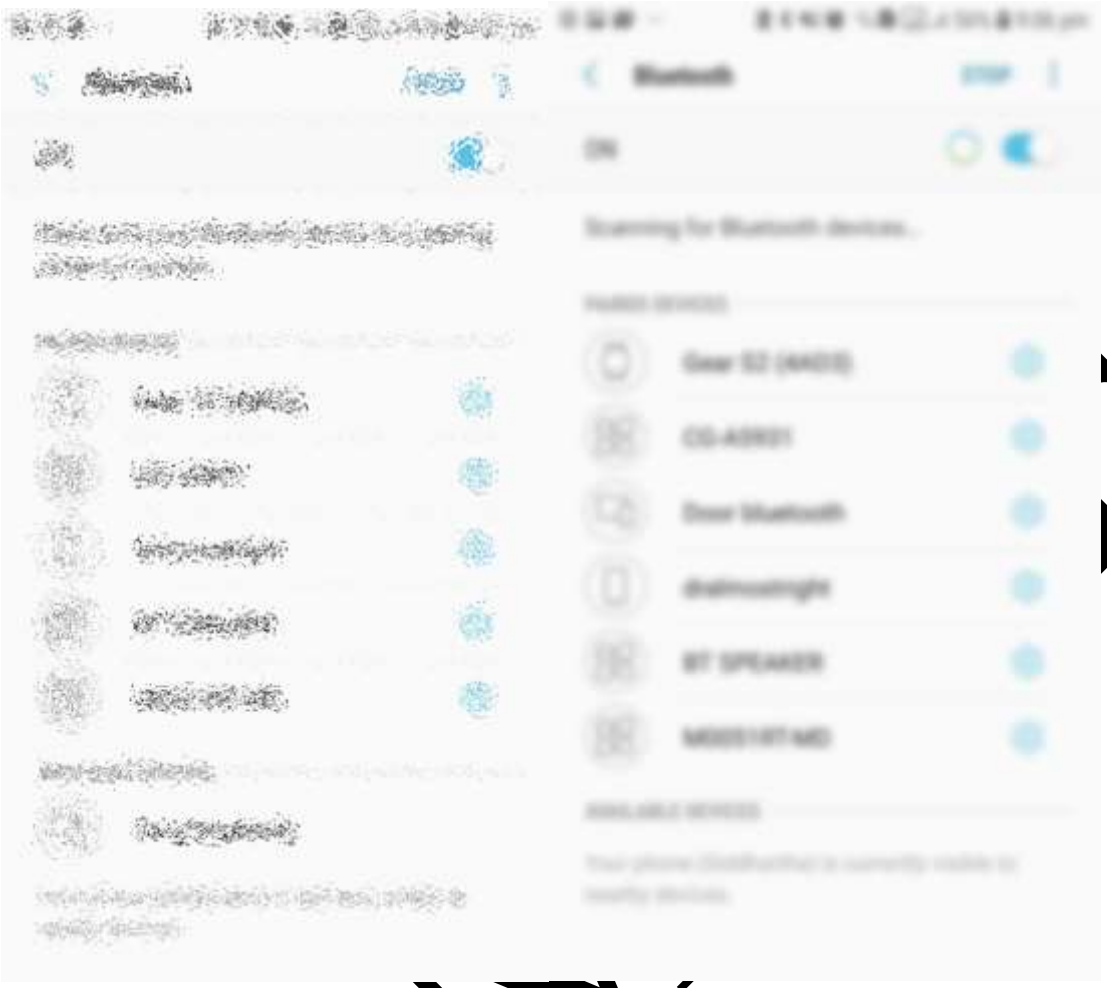





56% 9:09 pm
Arduino Bluetooth Door Control
Disconnect
Exit App
Enter Password
Close Door


Bluetooth
SCAN
Bluetooth pairing request
PIN contains letters or symbols
CANCEL
OK
1
2
3
4
5
6
7
8
9
0
Done

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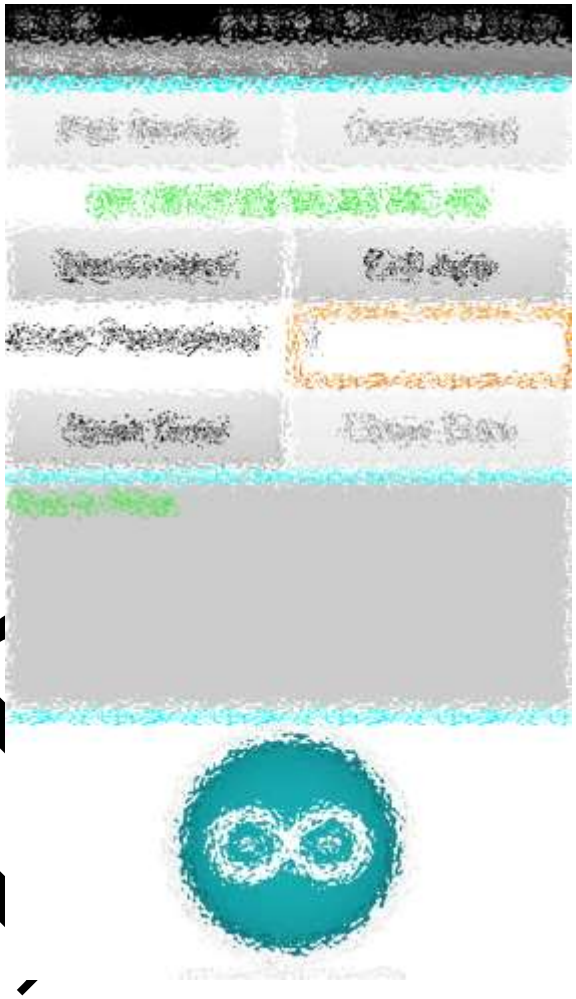
ON
Scanning for Bluetooth devices...
Gear S2 (4420)
CD-A3921
Door bluetooth
dralmostright
BT SPEAKER



Turnitin Report: -

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