STAFFROOM FACULTY MONITORING SYSTEM WITH AUTOMATIC LIGHTING

HEMANTH TS
JAMES GEORGE
JOHAN GEORGE MATTAPALLIL
JOSHUA RAJU

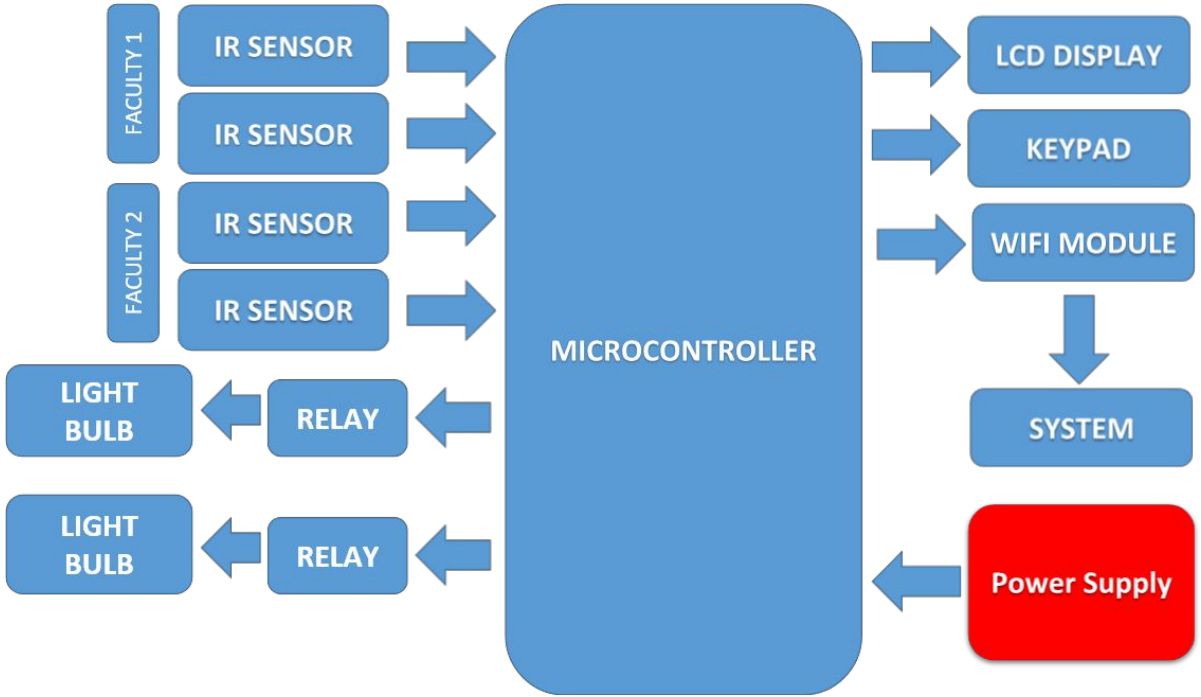
OBJECTIVE

- The main aim of this project is to monitor the availability of the faculties in a staffroom.
- It also determine whether the faculties are busy with other people or not.
- This data is displayed on an LCD screen as well as on a system.
- The teachers have an option to enter the time at which they would be back in their cabin.
- If the staffroom cabin is empty the light bulb automatically turns off.

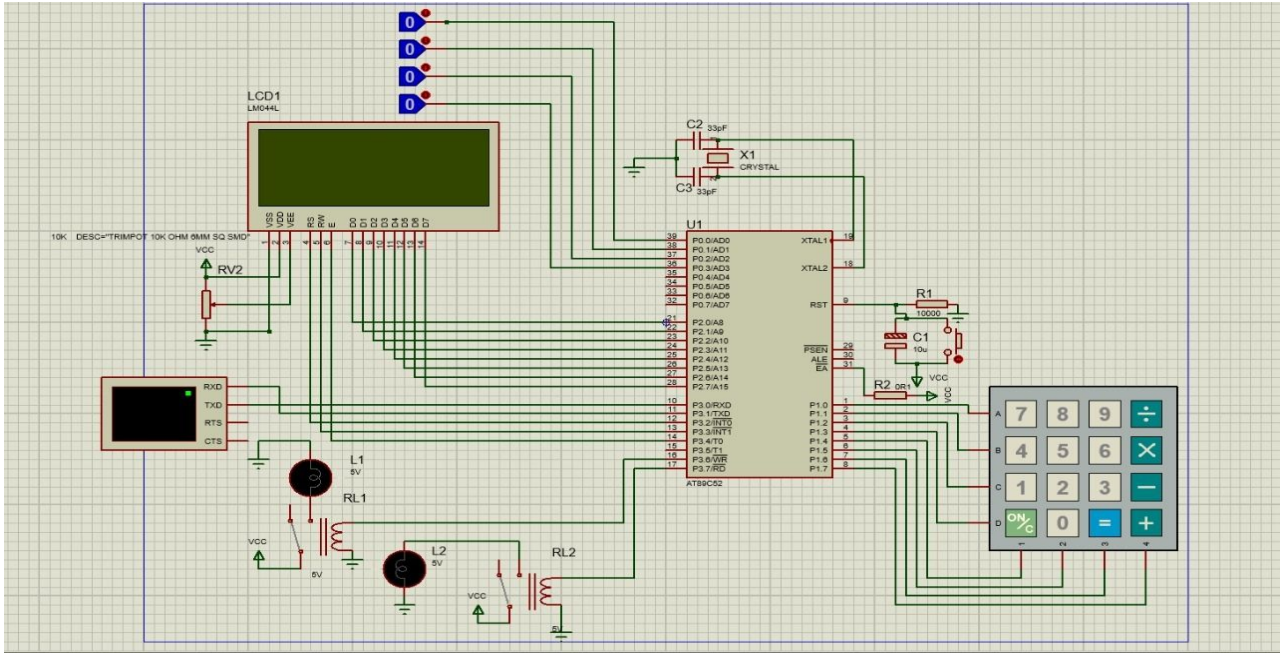
Expected Outcome:

- To design a circuit, using microcontroller (from the 8051 family) to implement a ‘Faculty Monitoring System’ and create a working Demo Model of the intended circuit and to bring it to it’s product form.
- Proper LCD display interfacing, Keypad interfacing and IR sensor implementation.
- Automatic lighting functionality.
- Adding the functionality brought by Wi-Fi to the project.

BLOCK DIAGRAM

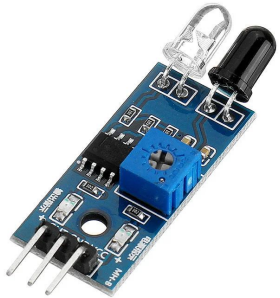


CIRCUIT DIAGRAM



HARDWARE REQUIREMENTS

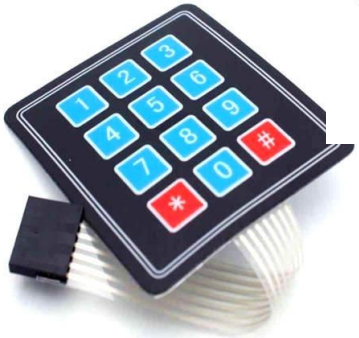
- AT89S52 MICROCONTROLLER
  - Low power
  - High performance
  - CMOS 8-bit
  - 4K bytes of internal system flash memory
- IR SENSOR MODULE
  - Operating voltage of 5V DC
  - Upto 20 cm range
  - Adjustable range of sensing



- 5V RELAY MODULE
  - 5V operating voltage
  - Wide range of controllable voltages
  - Standard interface that can be easily controlled by a microcontroller.

- ESP8266 12 E
  - 3.3 V operating voltage
  - Over 100 m range
  - Standard 802.11 b/g/n

- 20 x 4 JHD 204A LCD screen
- 4x4 Membrane KEYPAD
- LIGHT BULB



SOFTWARE REQUIREMENTS

PROGRAMMING LANGUAGE USED

- Embedded C

SOFTWARE USED:

- Keil uVision for Programming
- Proteus for Simulation
- Prog ISP (Burning program to microcontroller)
- EasyEDA (PCB layout design)

PROGRAM ALGORITHM

Step 1 : Change the count value for each cabin depending on which IR sensor activates first.

Step 2 : Depending on the count value display whether the teachers are “Available” “Unavailable” or “Busy” in their cabin.

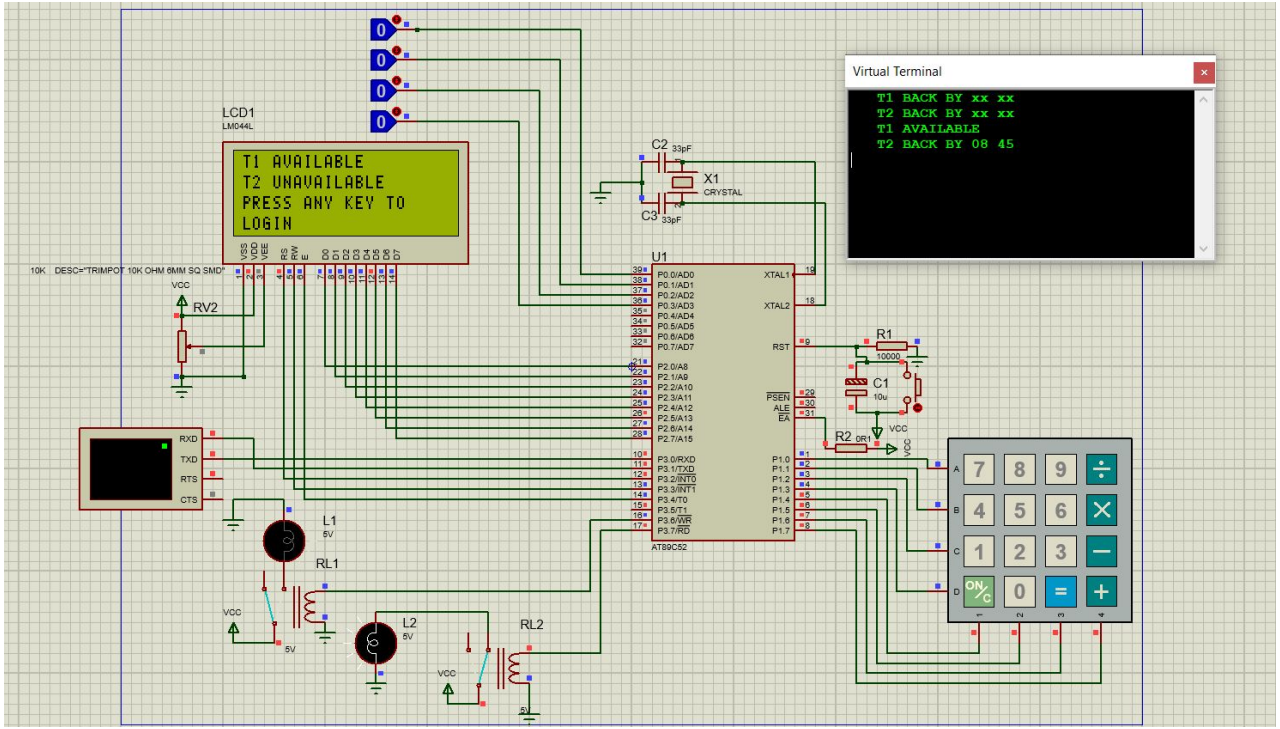
Step 3 : Depending on the input from the keypad allow the user to login to their student/ teacher portal using a password.

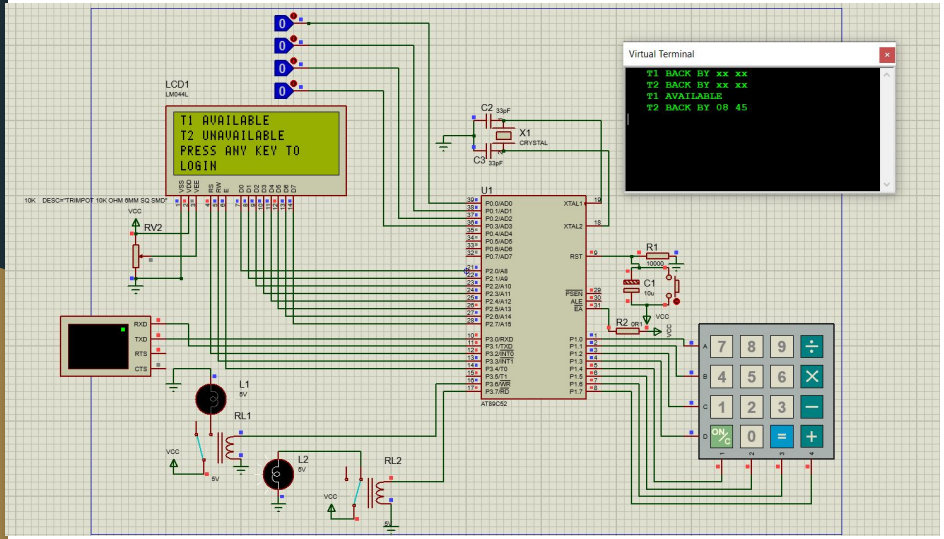
Step 4 : Allow the teachers to input the time at which they would be back and also to input whether other teachers in the cabin are on leave.

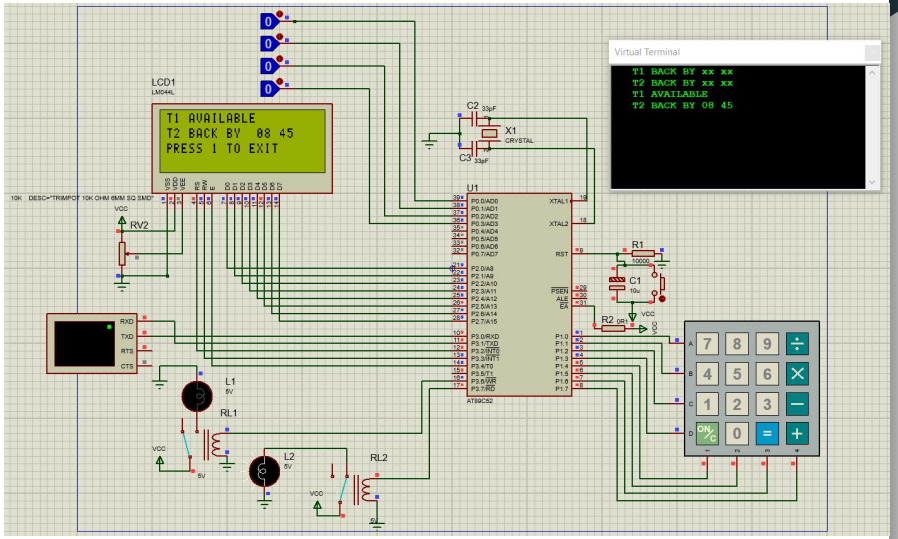
Step 5 : The students can view when the teachers would be back in their cabin after logging in.

Step 6 : Switch the relay depending on whether the cabin is empty or not.

SIMULATION RESULT



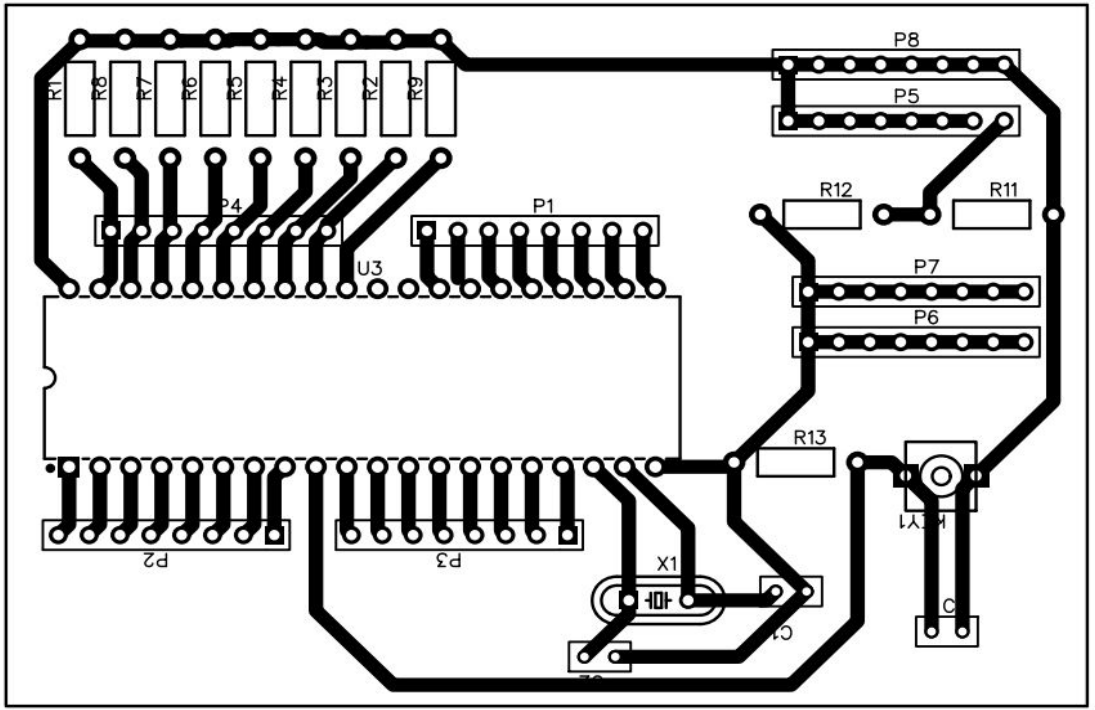

LCD1
LM044L
T1 AVAILABLE
T2 UNAVAILABLE
PRESS ANY KEY TO
LOGIN
Virtual Terminal
T1 BACK BY xx xx
T2 BACK BY xx xx
T1 AVAILABLE
T2 BACK BY 08 45
U1
AT89C52
RV2
X1
CRYSTAL
C2
C3
R1
C1
R2
L1
L2
RL1
RL2
VCC


LCD1
LM044L
T1 AVAILABLE
T2 BACK BY 08 45
PRESS 1 TO EXIT
Virtual Terminal
T1 BACK BY xx xx
T2 BACK BY xx xx
T1 AVAILABLE
T2 BACK BY 08 45
U1
AT89C52
RV2
X1
CRYSTAL
C2
C3
R1
C1
R2
L1
L2
RL1
RL2
VCC

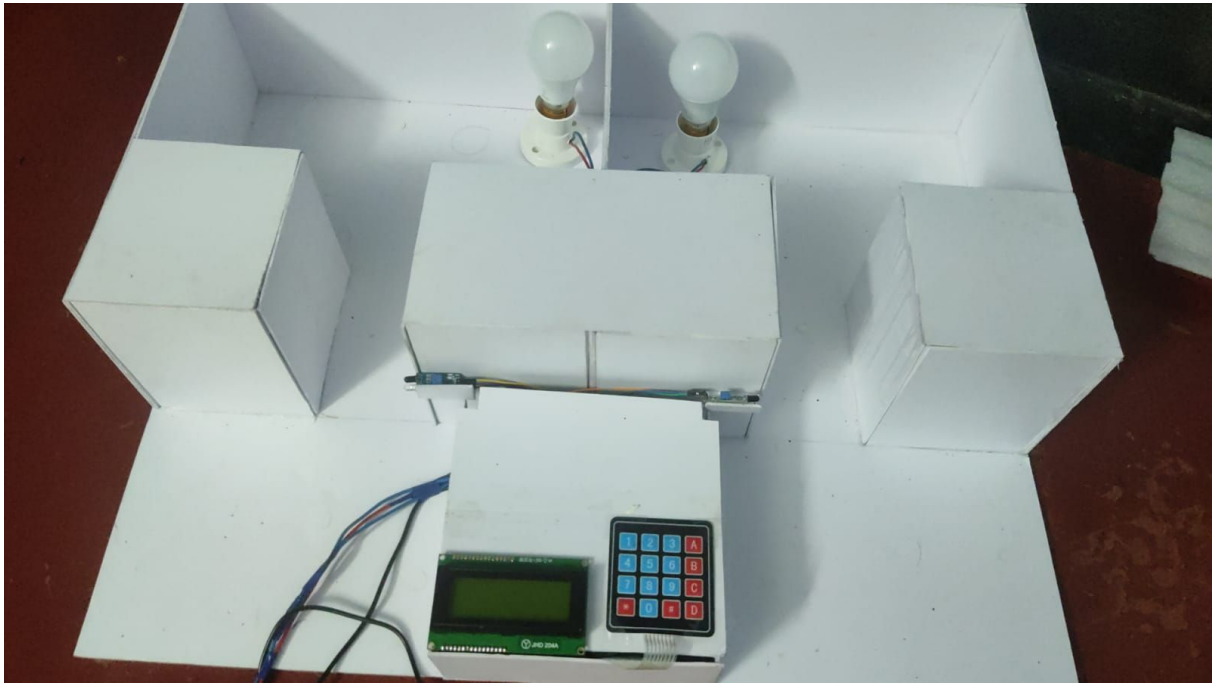
FINAL OUTCOME

- The circuit, using microcontroller (from the 8051 family) to implement a ‘Faculty Monitoring System’ has been designed, components integrated on a PCB, who’s layout design had been created has been implemented and verified.
- LCD display interfacing, Keypad interfacing and IR sensor implementation are done and it’s working has been verified.
- Wi-Fi module interfacing has not been satisfactorily implemented.
- Automatic lighting functionality has been implemented.
- The working Demo Model of the ‘Faculty Monitoring System’ is completed and its output has been verified .
- The ‘Faculty Monitoring System’ has been satisfactorily brought to it’s product form.

PCB LAYOUT



FINAL OUTPUT(PRODUCT FORM)




T1 AVAILABLE
T2 AVAILABLE
PRESS ANY KEY TO
LOGIN
JHD 204A
1 2 3 A
4 5 6 B
7 8 9 C
* 0 # D

FUTURE SCOPE

- To add extra sensors to detect that it is in fact the teacher that has entered the cabin.
- To be turned into a real time monitoring system through a mobile application, which can be accessed by student’s anywhere, at any time.
- To see this product be utilized in any institution that wishes to use the project for their Faculty.

CONCLUSION

- The aim of the project, which was to implement a ‘Faculty Monitoring System’ which is user accessible to both faculty as well as their respective student’s have been carried out and results have been verified, supported by a working demonstration product that also achieves the objective of implementing power efficient lighting solutions.

REFERENCE

- Archana D, Rajani D R, Shyalini C K, Vidyashree H N, Shilpashri V N, “Bidirectional Visitor Counter for Smart Power Management”, NCEIS, 2018
- Sowdhamini R, Gowthami D R, Deepika Hiremath, Santosh Kumar Verma, “MICROCONTROLLER BASED ROOM AUTOMATION AND BIDIRECTIONAL VISITOR COUNTER”, 13th International Conference on Recent Trends in Engineering Science and Management, 2018.