Electronic Voting Machine using 8051 Microcontroller

A report submitted in fulfilment of the requirements for J component of the ECE3003 "Microcontrollers and it's applications" course.

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VIT®

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

School of Electronics Engineering (SENSE)

Vellore Institution of Technology

Vellore

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DECLARATION BY THE TEAM MEMBERS

We hereby declare that the project report entitled “ELECTRONIC VOTING MACHINE USING 8051 MICROCONTROLLER” submitted to VIT University, Vellore is a record of J-Component project work carried out by us under the guidance of Dr. Debashish Dash. We further declare that the report has been written in our own words and have provided proper references whenever we referred to other articles or the internet.

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ABSTRACT

Voting is most pivotal process of democratic society through which people determine its decision. Nowadays electronic voting machine has become an effective voting tool compare with traditional paper-based voting schemes. Flawless voting is ensure by electronic voting machine. One more feature is that it avoids any kind of malpractice or invalid votes. Besides that, talking about economic benefits, this system is more economical than traditional paper-based voting schemes since the expenditure incurred on manpower is saved. It is also make voter feels convenient because he or she has to press only one button of the respective candidates to vote. Thus, we are decided to design an electronic voting machine to replace the traditional paper-based voting schemes due to several advantages like security, automatic counting, economic etc. This project presents a way to develop an electronic voting machine by using a 16x2 LCD. The electronic voting machine contains 6 switches which are New Entry switch, 4 switches for 4 candidates, and a Result switch. The New Entry switch is to avoid any kind of malpractice or invalid votes. The New Entry switch is under supervision and control of a conservator and a user can only vote after the New Entry is pressed. Besides that, the electronic voting machine only allow 1 vote for each user. If any user tries to press the switch multiple times to vote more, only the first vote will be registered. The 4 switches represent the respective candidates, voter can vote to the candidate that he or she desired to vote by press the switch that represent the candidate. The result will only display on the LCD screen at the end when the Result switch is press. So that, the result would not affect the decision of the voter during the voting process is on the way. Of course, the Result switch also under supervision and control of a conservator. Finally the number of votes of respective candidate will display on LCD and we can know that which candidate is won when the Result switch is pressed.

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Chapter 1

Introduction

1.1 About the Project

This LCD based electronic voting machine is designed for 4 candidates. The input part consists of a set of 6 switches. The switches and 16x2 LCD are interfaced to microcontroller for various operations and displays.

The provision of casting votes for the candidates has been provided through 4 of these switches (one for each candidate). These switches are made active high and connected to input pins of the controller.

The remaining 2 switches are New Entry and Result. The New Entry switch initializes the voting system when pressed, while the Result switch ends the voting and displays the result (total number of votes for respective candidate) and winner on LCD screen.

This system is set to 1 vote for each voter. In other word, the voter cannot make the second vote even he or she press the switch as long as the New Entry switch is press.

1.2 Objective

The main objective of this project is to design and create a general electronic voting machine to replace the traditional paper-based voting schemes so that we can take an advantages in term of economic and convenient.

Electronic voting machine is more economic because less manpower is required and may saves transportation cost due to its compact size. It is also more convenient and time conscious as less time required for voting and counting.

Besides that, it is also more secure due to avoid invalid voting such as a people make a vote twice.

Other than that, paper-based voting can actually miss ballots due to human mistakes in placing the paper-based ballot in the machine. But, this will be not happen at electronic voting machine.

The following is the advantages of electronic voting machine:

1. It is economical

2. Less manpower required

3. Time conscious

4. Avoids invalid voting

5. Convenient

Chapter 2

Methodology

2.1 Components Required

The components required for this work are very cheap and easily available.

List of components:

8051 MICROCONTROLLER (AT89C51)
LCD DISPLAY
POWER SOURCE DC
BUTTONS

We are simulating in proteus software

2.2 Block Diagram

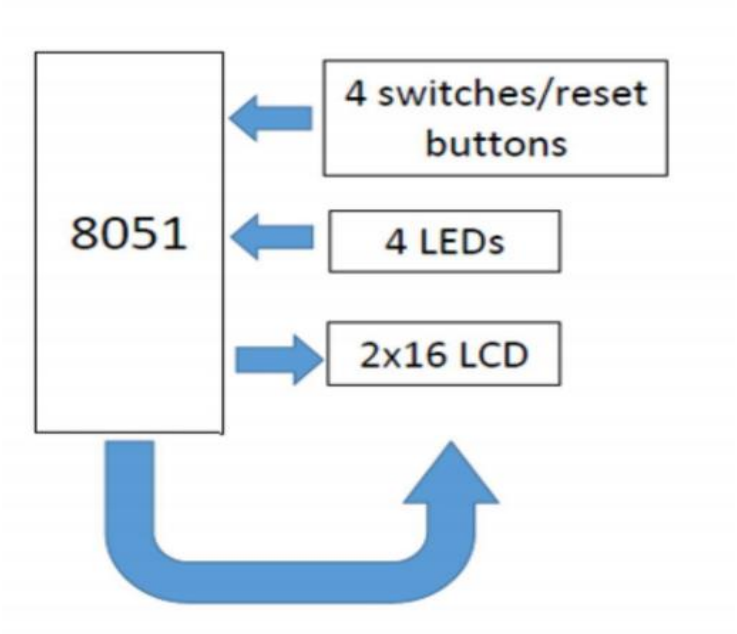

Fig 2.1

The figure 2.1 shows the block diagram of our work.

2.3 Circuit Diagram

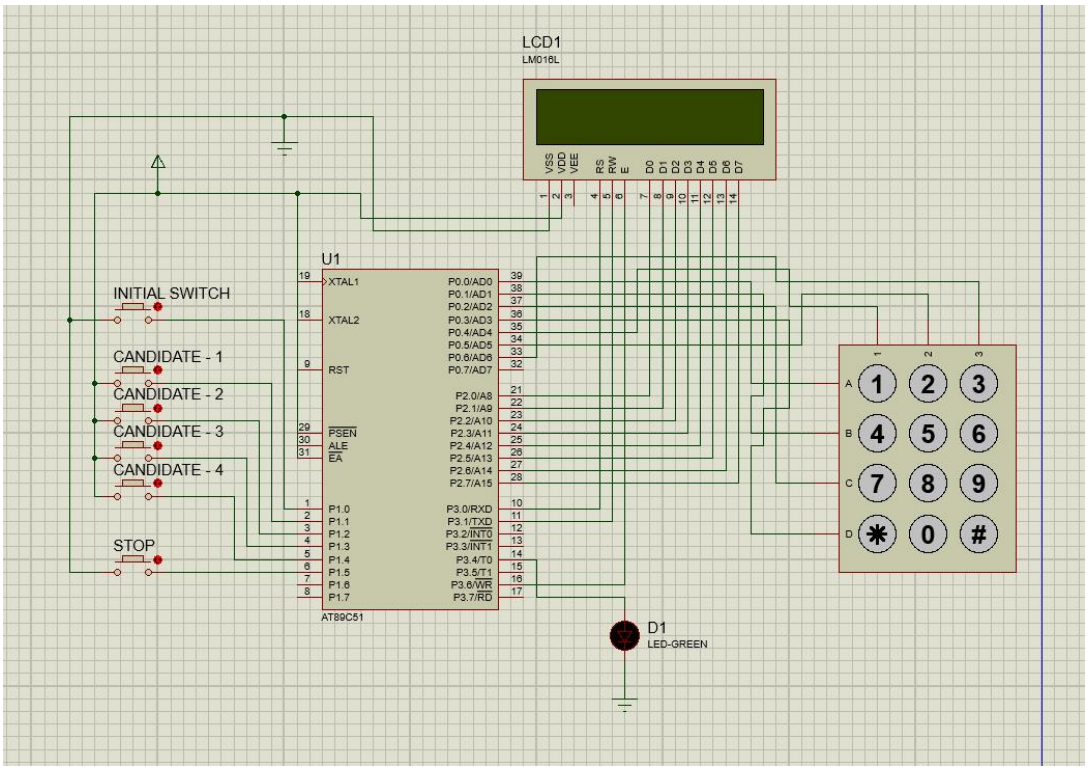

Fig 2.2

The figure 2.2 shows the circuit diagram of our project as of the simulation.

2.4 Flowchart

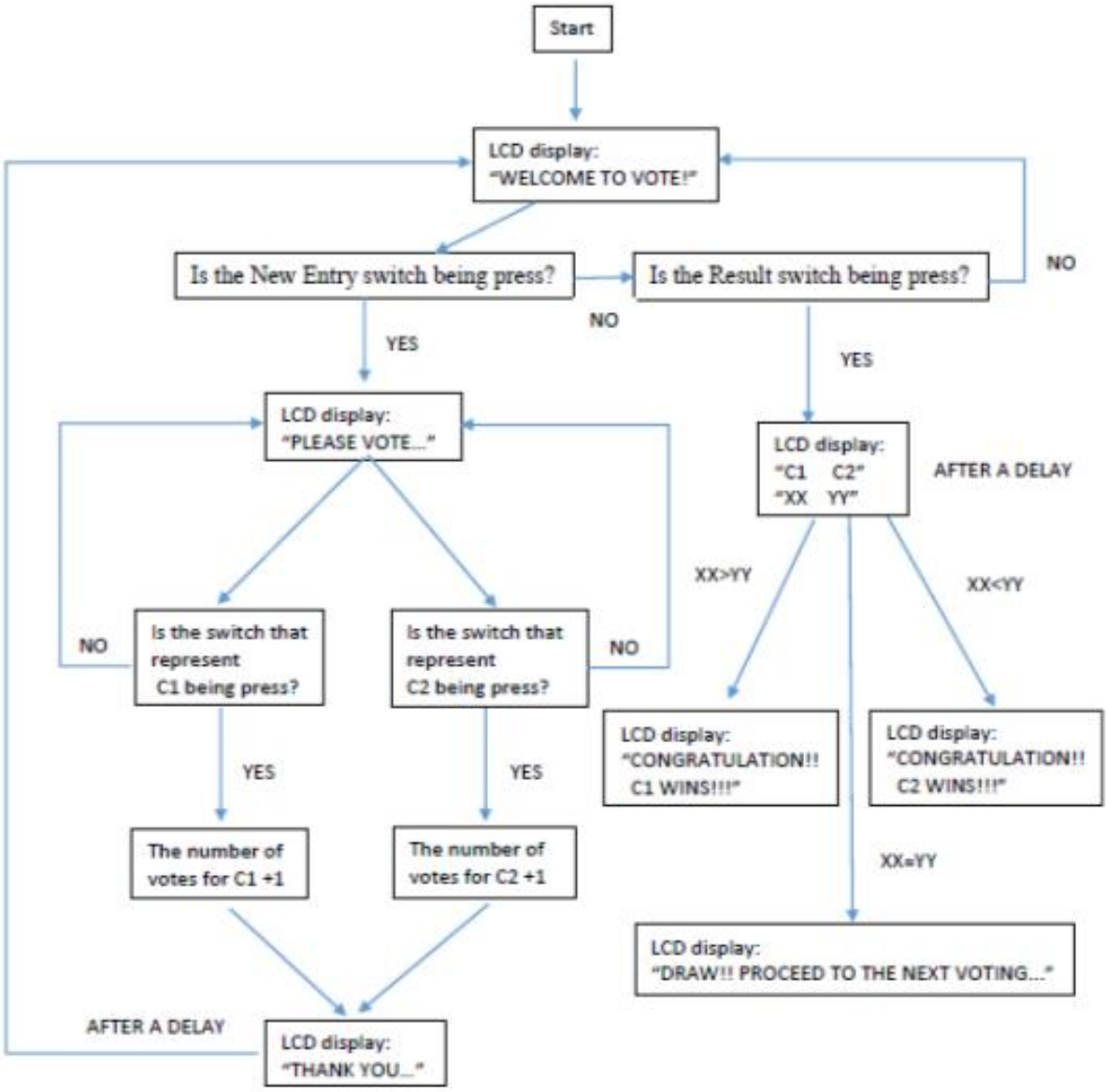

Fig 2.3

The figure 2.3 shows the flowchart of working of our project as of the simulation.

Chapter 3

Results and Discussion

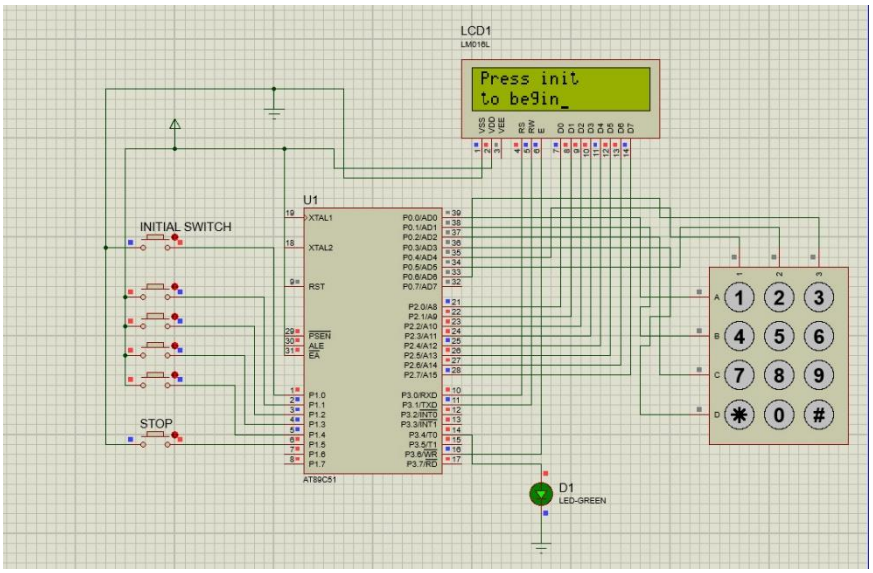

Fig 3.1

Figure 3.1 shows the initial status of LCD that shows press the init switch

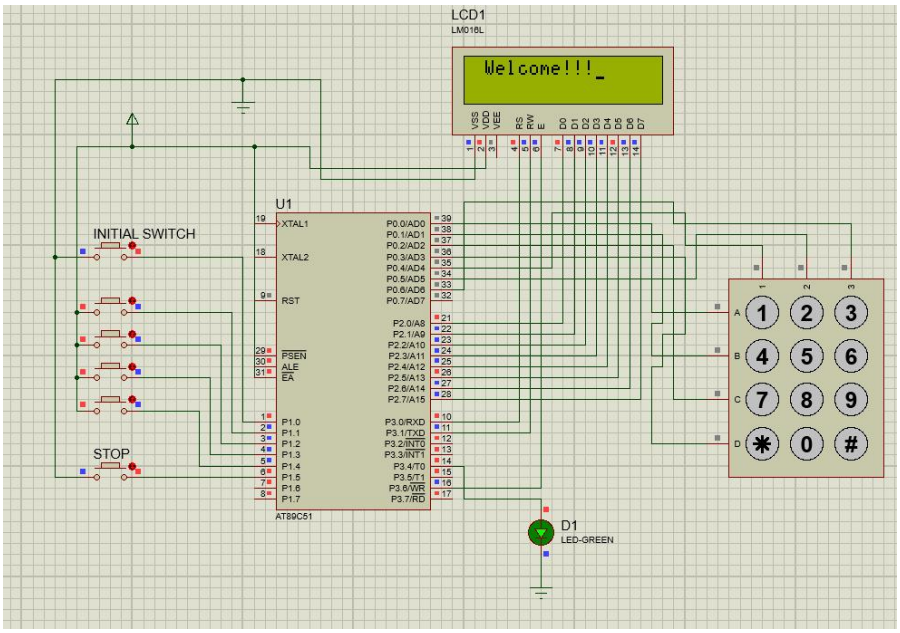

Fig 3.2

Figure 3.2 shows the LCD that shows welcome after pressing the init switch

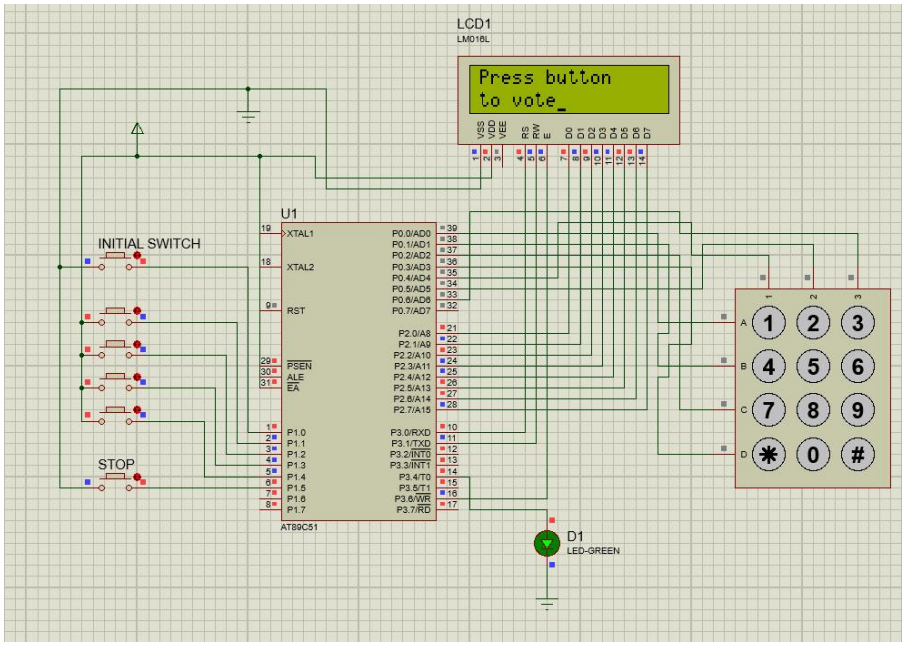

Fig 3.3

Figure 3.3 shows the LCD that shows press button to vote

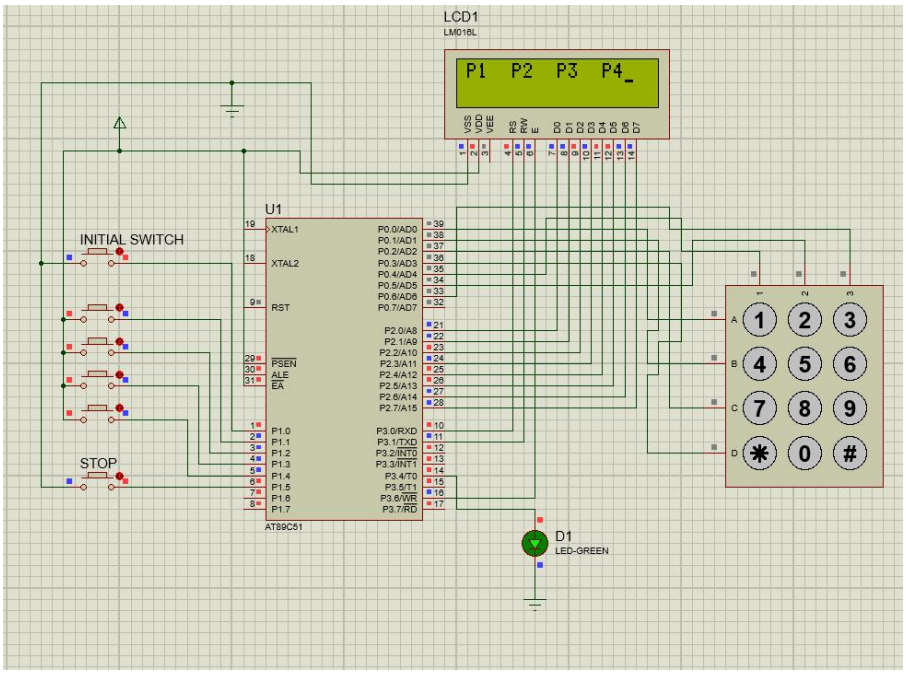

Fig 3.4

Figure 3.4 shows the LCD that shows 4 candidates in the election

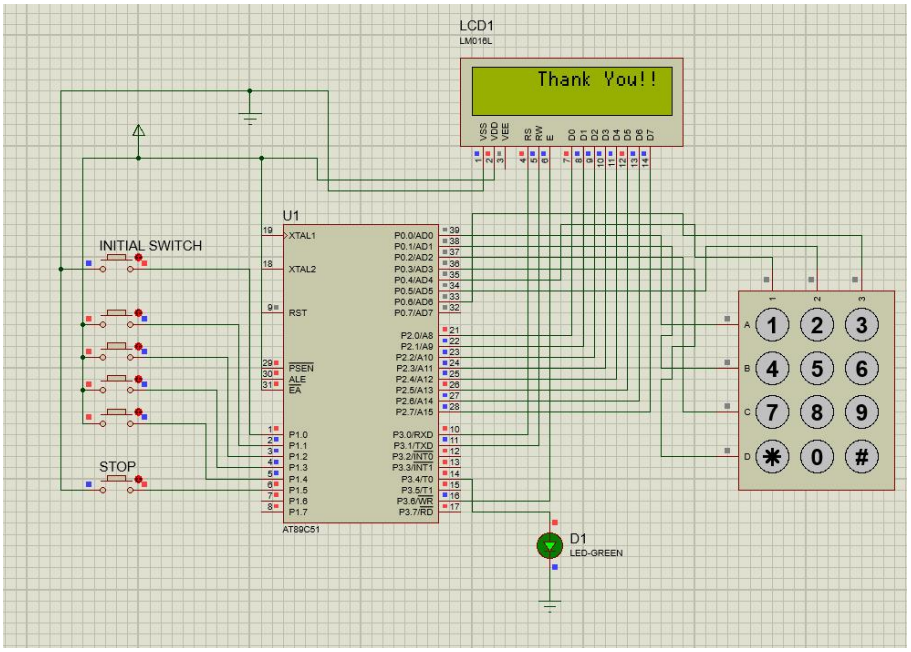

Fig 3.5

Figure 3.5 shows the LCD that shows thank you after voting

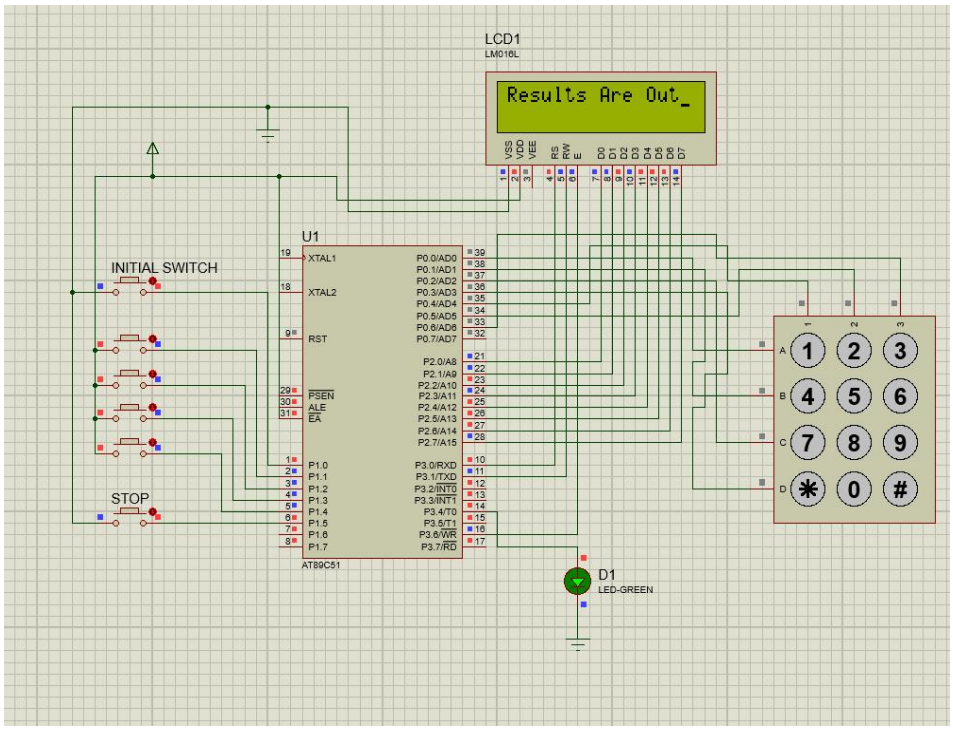

Fig 3.6

Figure 3.6 shows the LCD displays the message “Results are out”

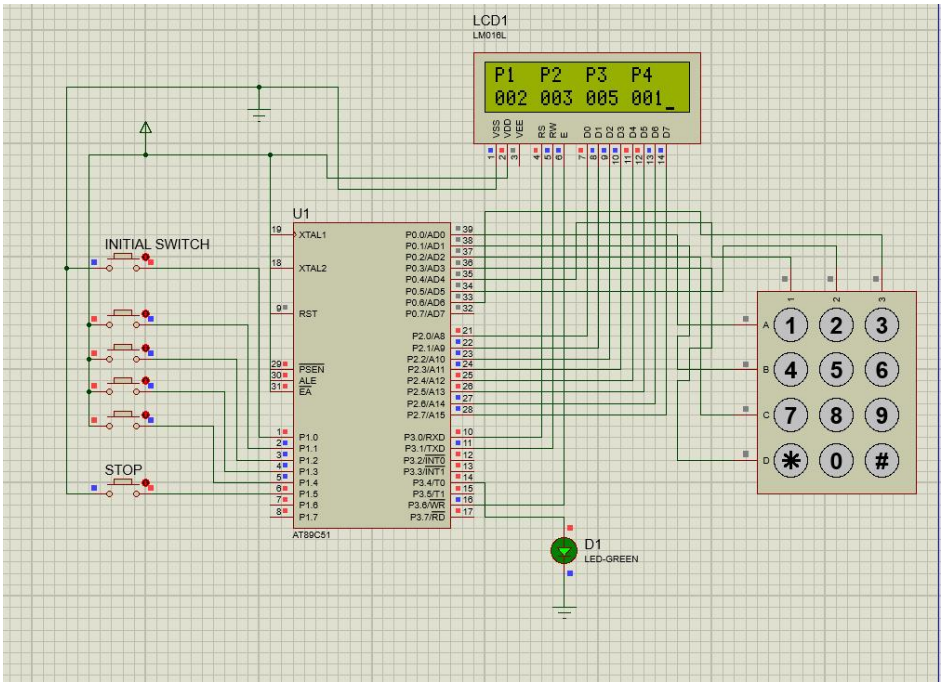

Fig 3.7

Figure 3.7 shows the LCD displays the number of votes casted for each candidate

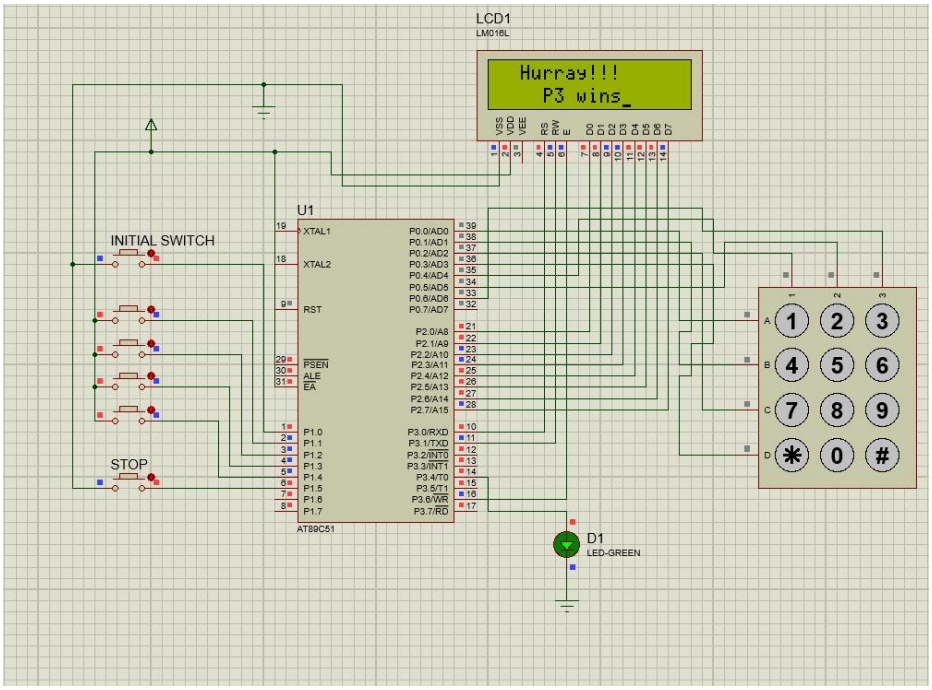

Fig 3.8

Figure 3.8 shows the LCD displays the winner

Chapter 4

Conclusions and Future work

4.1 Conclusion

This project show that we can use the microcontroller 8051 to design a electronic voting machine which is more secured, convenient, and economic compare with the traditional paper-based voting scheme.

We are successfully build up an electronic voting machine which can be used for school and college level council elections or any voting purpose event. The function of the circuit is working according to what are we predicted and the objectives is achieve. This show that our program code and circuit design can be implemented to a real life.

In this project, we learned some extra code of microcontroller 8051 which we did not learn from the lab session and we are able to use those code. We learned how to interface the microcontroller 8051 with LCD screen.

We learned how to solve the problem that we faced during this project. We hope that our project will not only work on our circuit design, but also it can work in a real life by do some improvement on it. So that it could be used for voting purpose at any required place.

4.2 Problems Faced

Problem 1: When we display those message on LCD screen, we found that the cursor on LCD screen keep on moving and it is too annoying for the user.

Solution: We change the command to LCD from 0E (display on, cursor on) to 0C (display on, cursor off).

Problem 2: We are going to display the number of votes of candidate that have stored in register on LCD screen. Then, we realise that the LCD display the other character instead of the number.

Solution: We found that LCD can only read ASCII code and the number that stored in the register is HEX code. By refer to the table of comparison between ASCII code and HEX code, we found that we could convert the HEX code to ASCII code by adding 30H for the numbering part. In other word, 30H will display 0 on LCD, 31H will display 1 on LCD.

Problem 3: After we solved the problem 2, we are facing the other problem that we can only display the single digit (0-9) to LCD screen due to only 0-9 available on ASCII code. Double digits such as 17, 23 will display the other characters on LCD.

Solution: First we move the number that stored in the register to Accumulator and move 10H to register B. After that, we use the function DIV AB and move the content of A and B to another 2 registers follow by add 30H for both registers and finally display on LCD screen.

4.3 Advantages

Can Replace the Newey introduced VVPAT Slips. Because, if the Number of Votes and VVPATs aren't tallied, then the result is declared using VVPAT count which may actually impact the Election result in negative direction

4.4 Future work

[1] Instead of Simply Making a Voting Machine using 8051, we could also use modern techniques like PASSWORD PROTECTION, BIOMETRICS, TWO FACTOR AUTHENTICATION USING CLOUD COMPUTING etc. for elevating the safety and security of Electronic Voting Machine.

[2] With PASSWORD PROTECTION, only an authorized official can access the main settings and applications of EVM like viewing Poll results etc.

[3] Since Password can be more likely to be less confidential, we could also BIOMETRICS of an authorized official to access the main settings and Applications of EVM.

[4] Using the modern technology, we could Deploy CLOUD COMPUTING and hence can connect the entire system to Cloud, hence thereby, only an authorized official can Login to access the main settings and applications of the EVM

Chapter 5

Appendices

5.1 Code for 8051 in embedded C

Artwork 5.1

The above Artwork 5.1 is the EMBEDDED C Code for our Project. It will take us to the Github where the code of the project can be viewed and examined

5.2 What is Github?

GitHub is a code hosting platform for collaboration and version control. GitHub lets you (and others) work together on projects. Github is a multiproject community

A GitHub **repository** can be used to store a development **project**. It can contain **folders** and any type of **files** (HTML, CSS, JavaScript, Documents, Data, Images).

Chapter 6

References

[1] A. M. Jagtap, V. Kesarkar and A. Supekar, "Electronic Voting System using Biometrics, Raspberry Pi and TFT module," 2019 3rd International Conference on Trends in Electronics and Informatics (ICOEI), Tirunelveli, India, 2019, pp. 977-982, doi: 10.1109/ICOEI.2019.8862671.

[2] S. S. Kadam, R. N. Choudhary, S. Dandekar, D. Bardhan and N. B. Vaidya, "Electronic Voting Machine with Enhanced Security," 2018 3rd International Conference on Communication and Electronics Systems (ICCES), Coimbatore, India, 2018, pp. 403-406, doi: 10.1109/CESYS.2018.8723921.

[3] R. Rezwan, H. Ahmed, M. R. N. Biplob, S. M. Shuvo and M. A. Rahman, "Biometrically secured electronic voting machine," 2017 IEEE Region 10 Humanitarian Technology Conference (R10-HTC), Dhaka, 2017, pp. 510-512, doi: 10.1109/R10-HTC.2017.8289010.

[4] B. R., R. B. S., S. P. and K. V.K.G., "Smart voting," 2017 2nd International Conference on Computing and Communications Technologies (ICCCT), Chennai, 2017, pp. 143-147, doi: 10.1109/ICCCT2.2017.7972261.

[5] S. M. Ali et al., "Micro-controller based smart electronic voting machine system," IEEE International Conference on Electro/Information Technology, Milwaukee, WI, 2014, pp. 438-442, doi: 10.1109/EIT.2014.6871804.