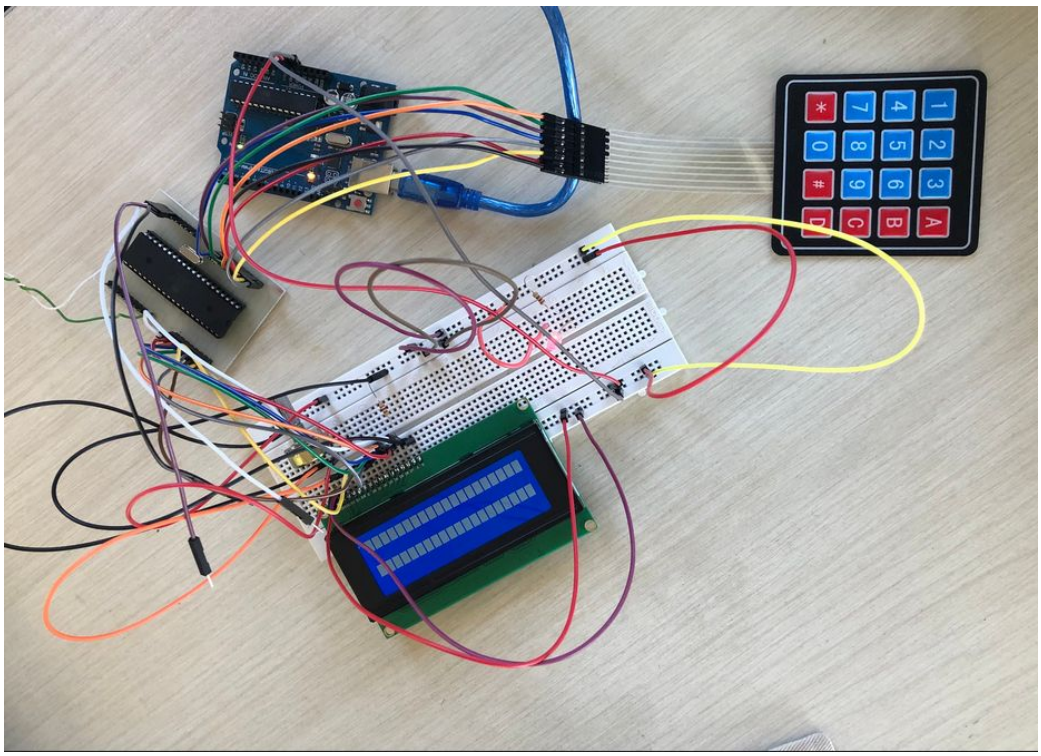
Microprocessor

Final Project Report

A voting system with Atmega32



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Introduction

This project is a safe digital voting system using atmega32. It is meant to ease the process of voting and counting votes in a safe protected way. On a big scale, every region has its device in which ids of all voters living there plus the id of a master who can see the result is added to the device's memory so everyone must first authenticate. When the deadline for voting comes, the master stops the process. In this step, the result of the voting is encrypted using the symmetric key method so it can't be hacked while it is sent to the central processor via the internet by the master. More details of the software and also the hardware are also included below.

Required Components

- Breadboard
- PCB
- Atmega32
- Capacitor
- Keypad 4*4
- LCD 4*20
- Regulator
- Wire
- Resistor
- Female pin-header
- Crystal 8MH (optional)
- Potentiometer

PCB

The first defined circuit contained: four 8*1 pin headers for communicating with microcontroller ports, one 8MH crystal connected to XTAL pins of the microcontroller, one 2*1 pin header for connecting VCC and GND. You can see the schematic form in fig1, PCB layout in fig2 and 3D output in fig3. But we couldn't use this layout for our project because 1.no company accepted proteus version 8.9 output -_-, 2.it was a mixture of SMD and dip

components :), AVCC was not connected :D. So we decided to figure these out using Altium. My coworker will explain more :))))

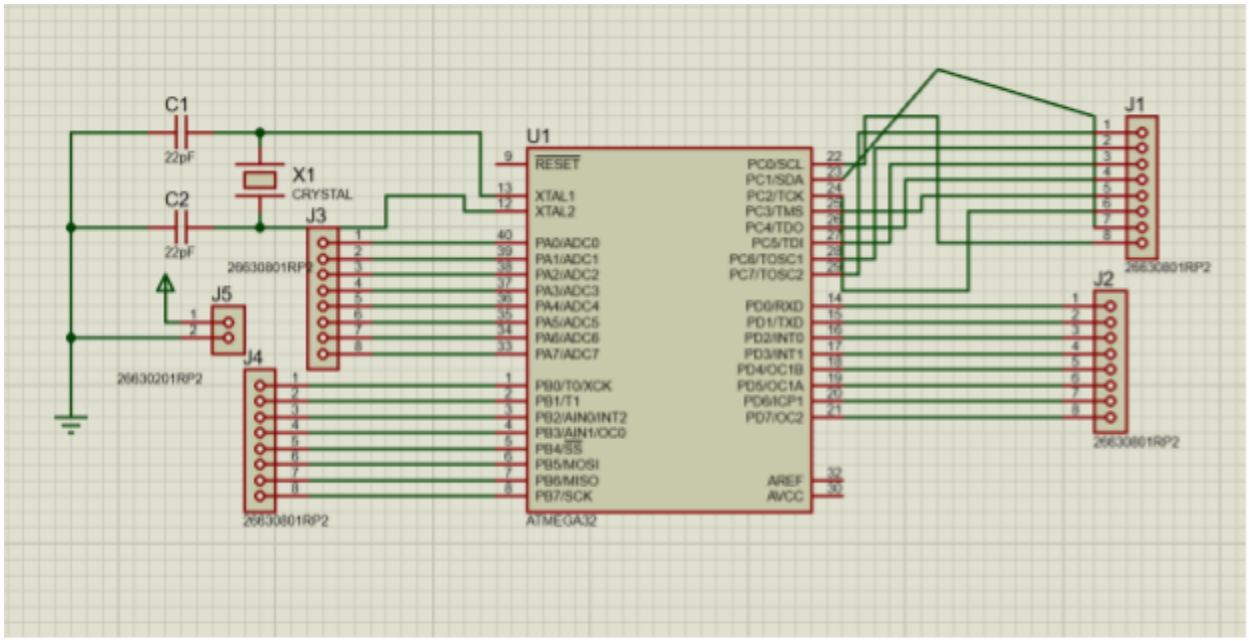


fig1

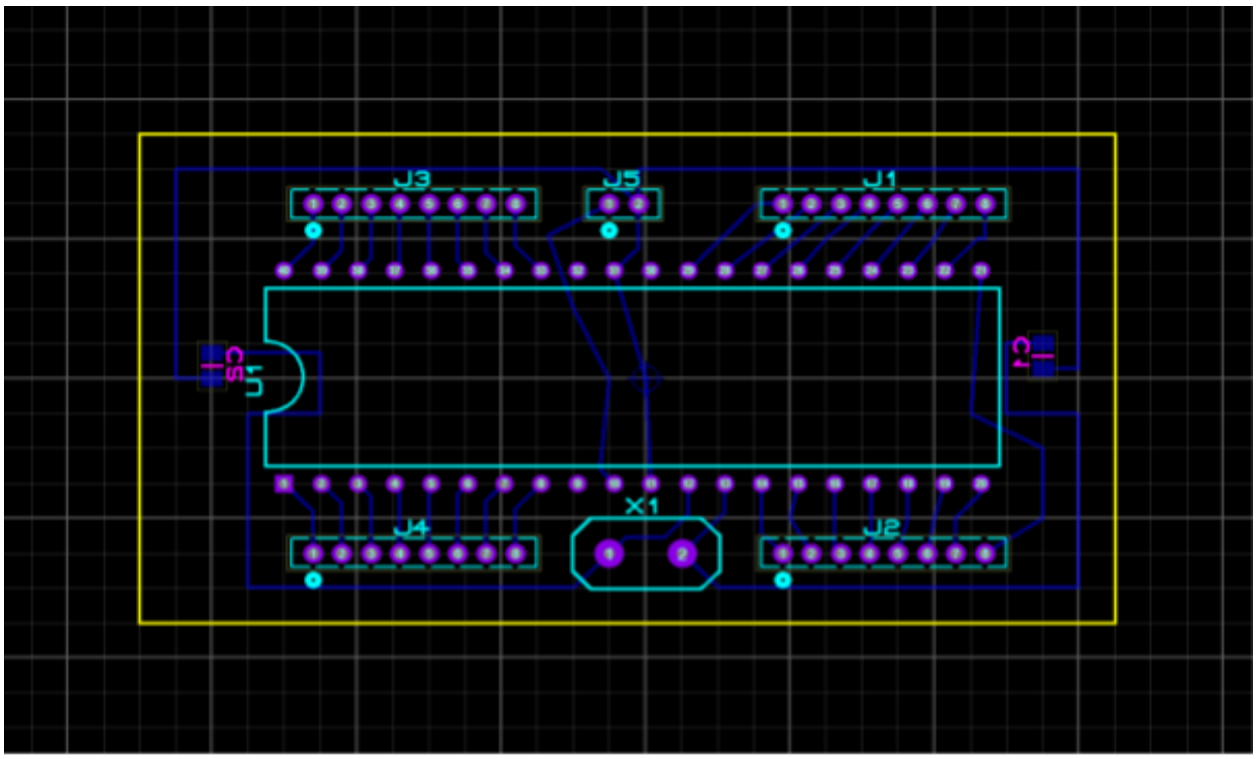


fig2

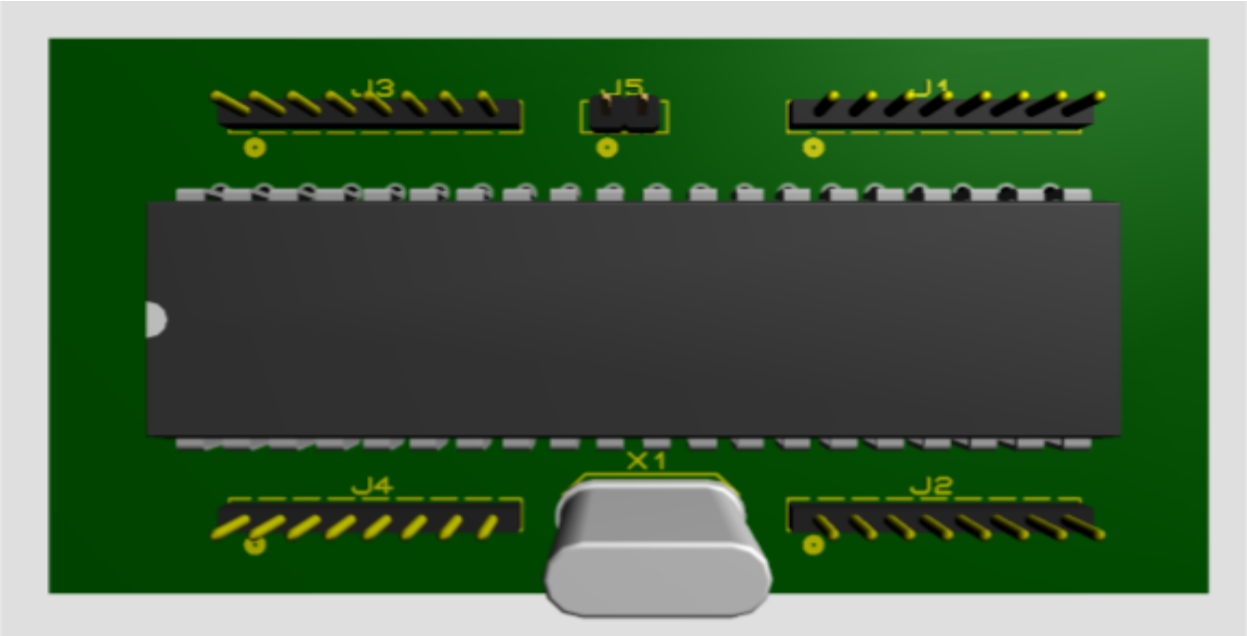


fig3

After the changes, we reach the other PCB that's designed with Altium, absolutely it's not a professional PCB; it has lots of bugs but for our first attempt I think we did our job perfectly well. Fig 4 is schematic and fig 5 is PCB.

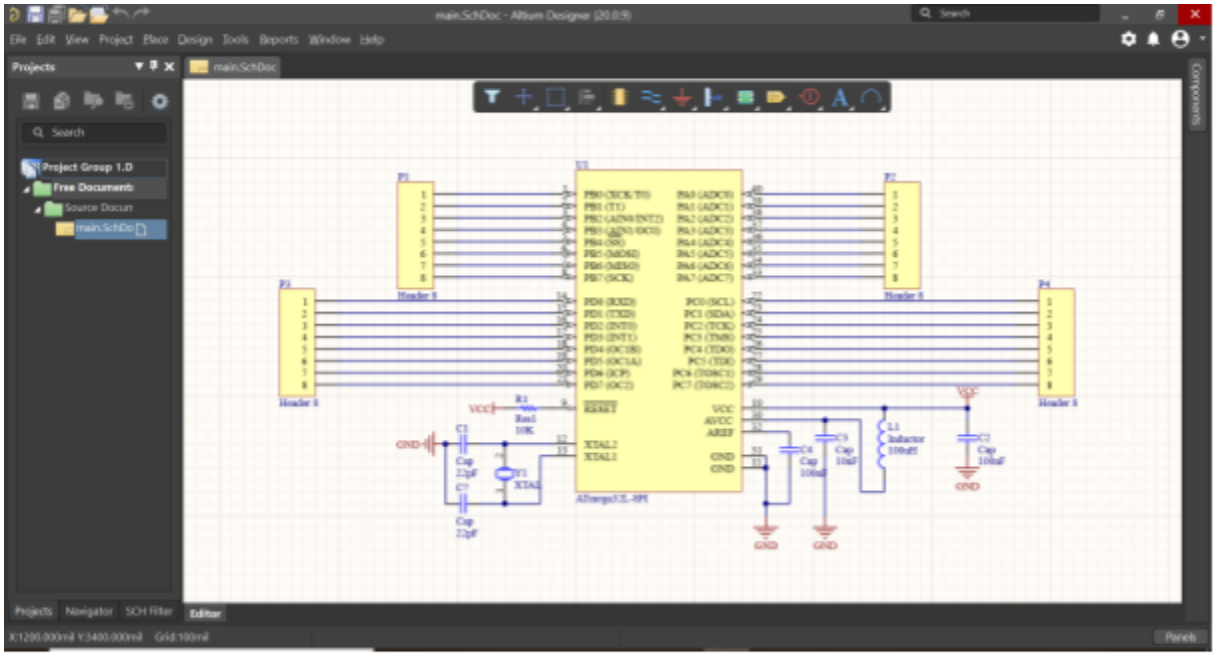


fig4

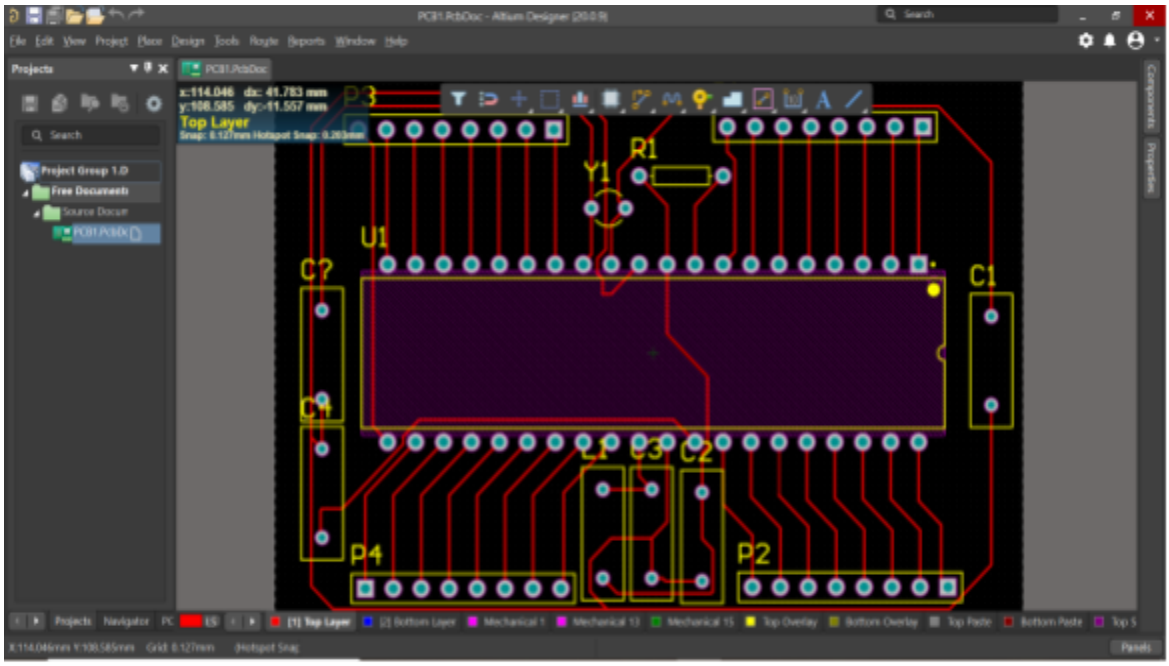
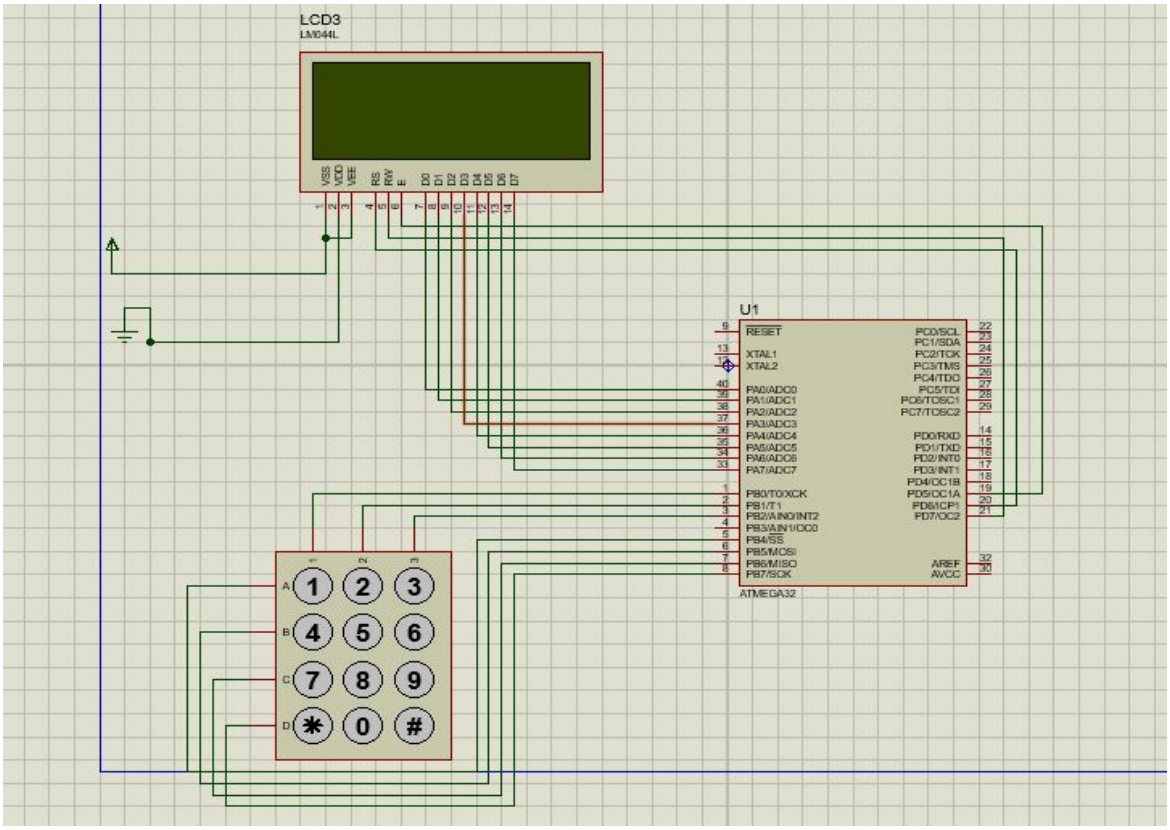


fig5

Circuit Diagram and Simulation



Circuit Diagram and Simulation

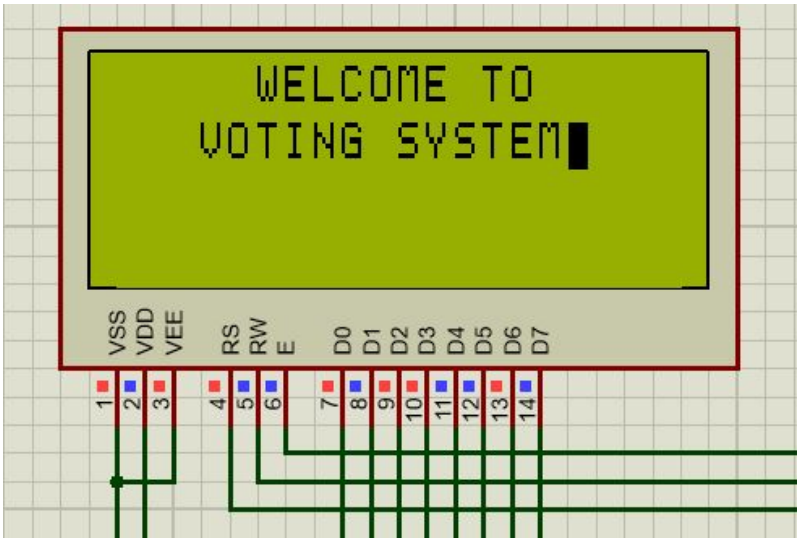
Code Explanation

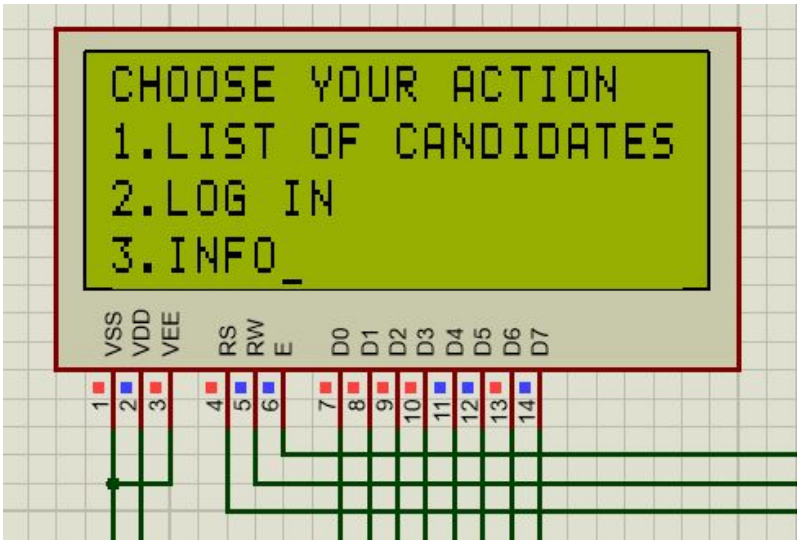
Assume that we use LCD and KEYPAD in this project we need to implement LCD's and KEYPAD's register configurations. First, make PORT A as output and make PORT B input.

After that, set the LCD register (RW, RS and E bits) in **send_a_command()** and **send_a_character()** functions.

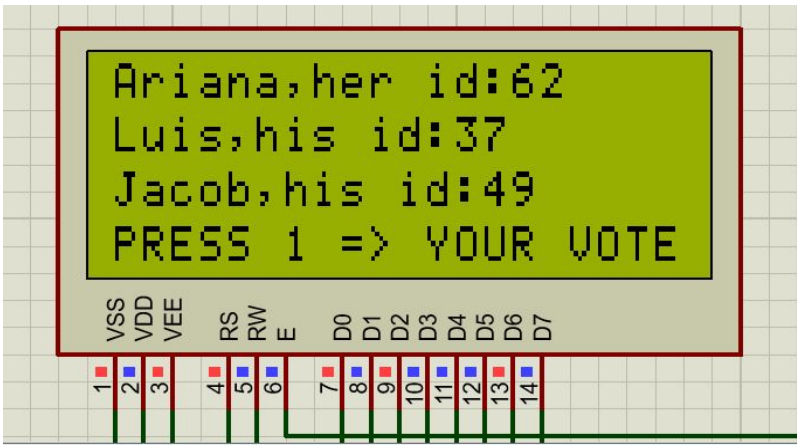
Each time you want to send a string to show on LCD, you can use the **send_a_string()** function.

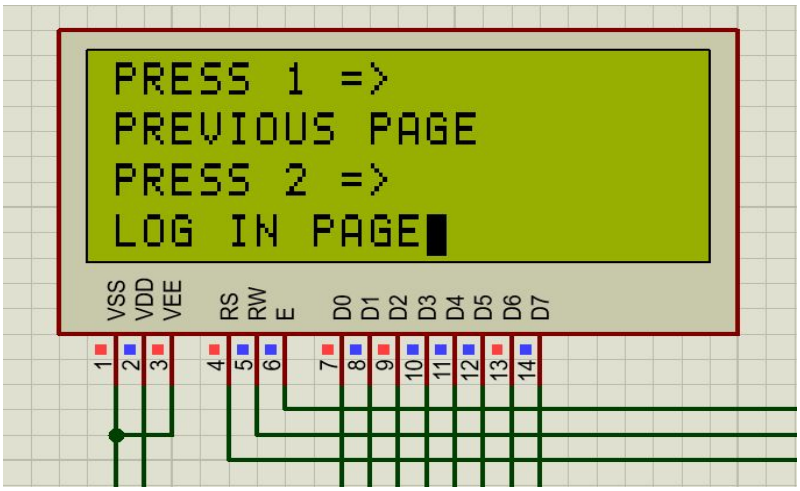
When you turn on the atmega32, the first thing you see is a menu that shows you several options to choose from.



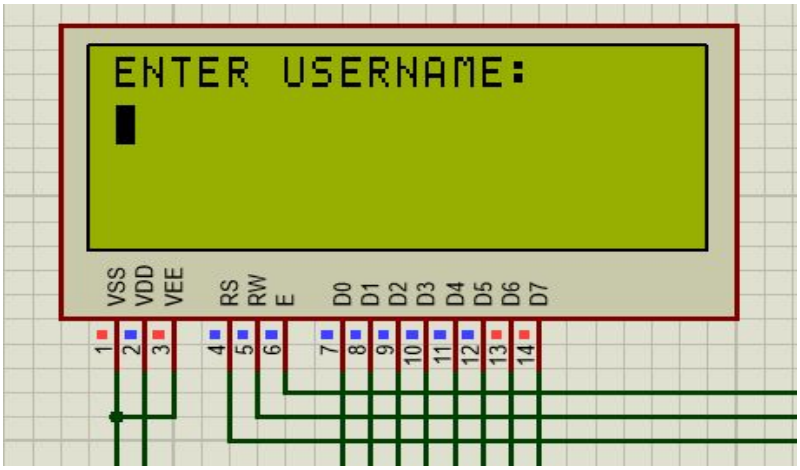


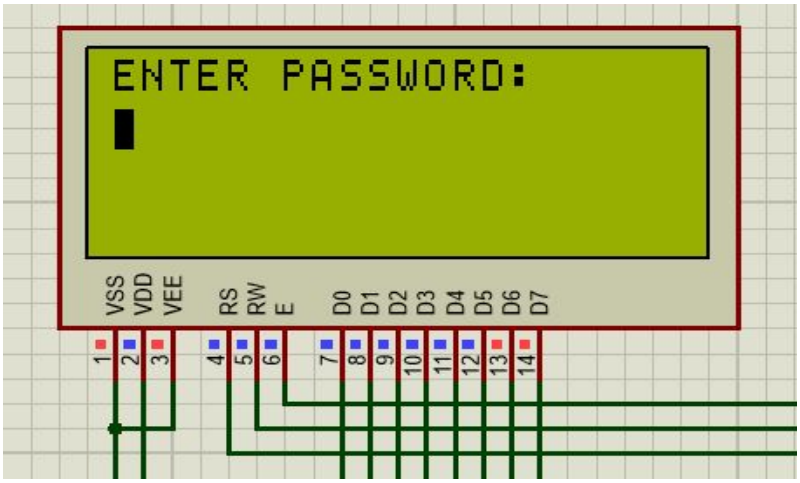
If you click on number 1, you enter the candidates' list (**listOfCandidates()** function). In this page, you see all candidates with their IDs, so you can write your favorite candidates' ID in your mind and click on the menu page number, after that, you can click on number 2 in a menu page, and enter the login menu.

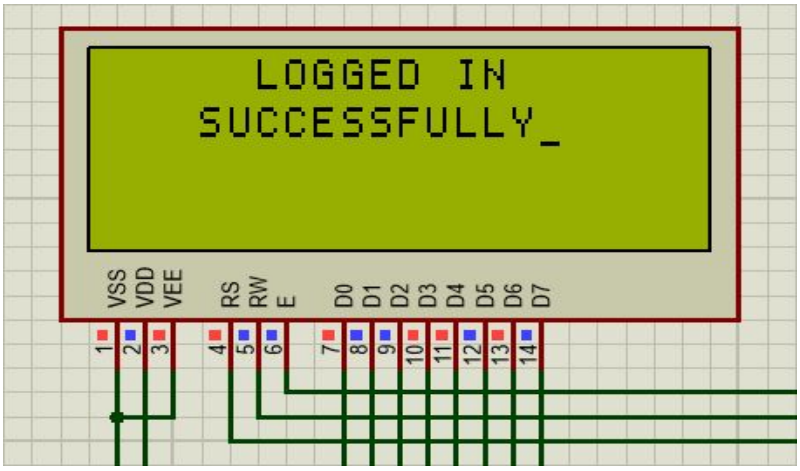


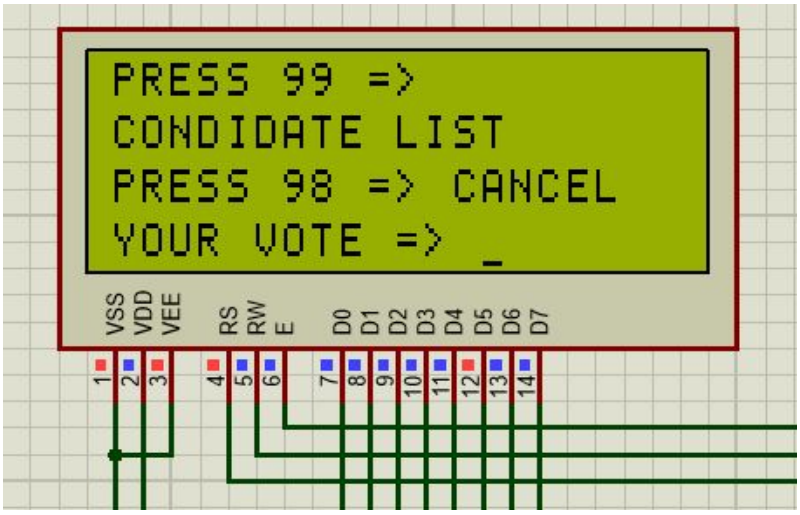


In the login menu, you should enter your username and password (**logIn_USERNAME()** and **logIn_PASSWORD()** functions), if both of them correct, you will able to voting (**votingFucntion()** function) to your favorite candidate or you can cancel this operation if you enter number 98. Also, you can enter number 99 to see the candidates' list again.

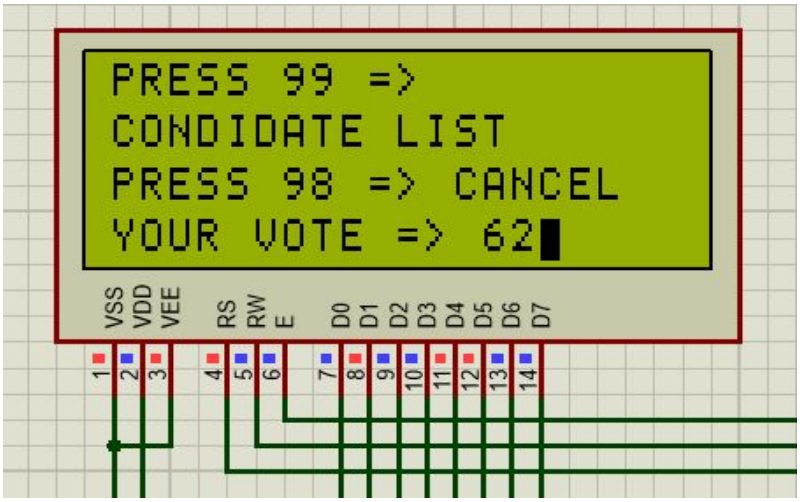


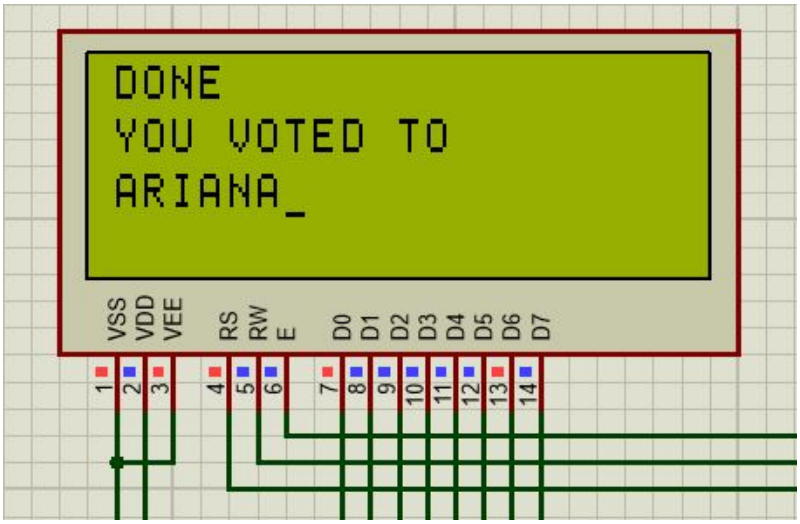




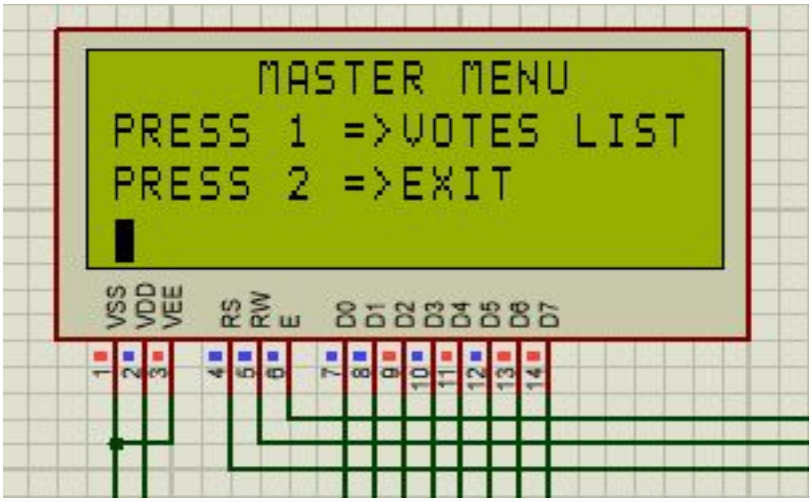


If you voted for someone, your password and username are made lock and you cannot vote again. But if you cancel your voting, you will be able to vote another time.

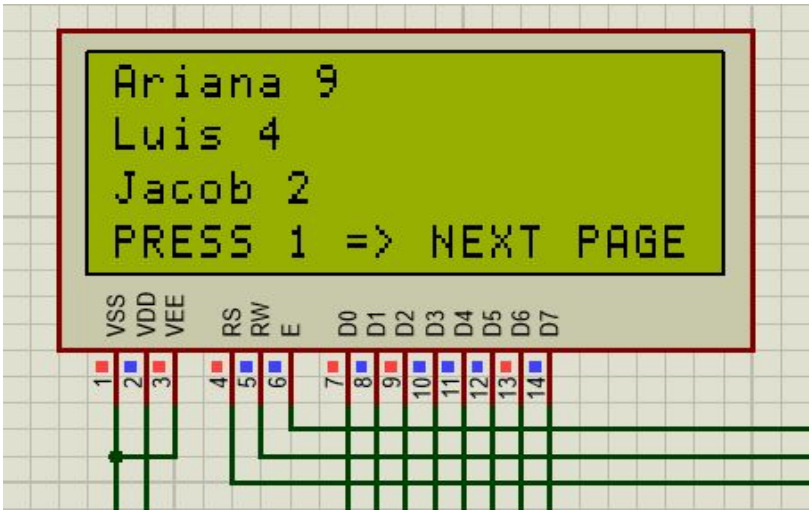




If you were master after you enter your username and password, you enter the master menu (**masterMenu()** function).

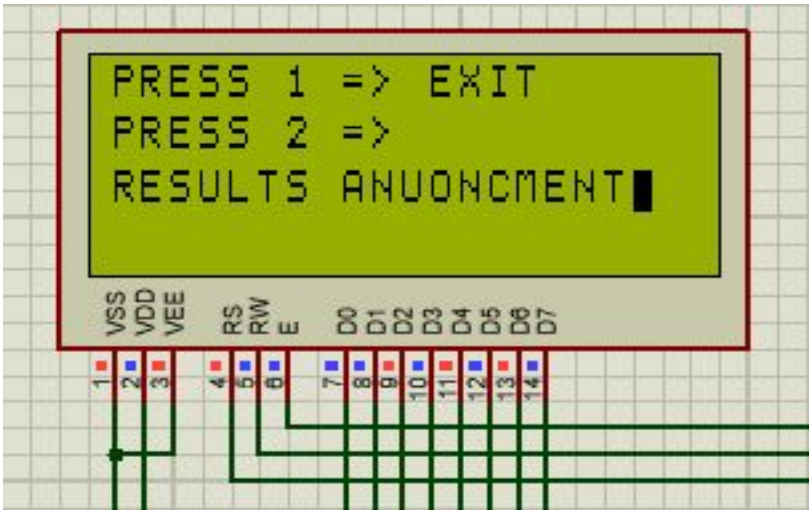


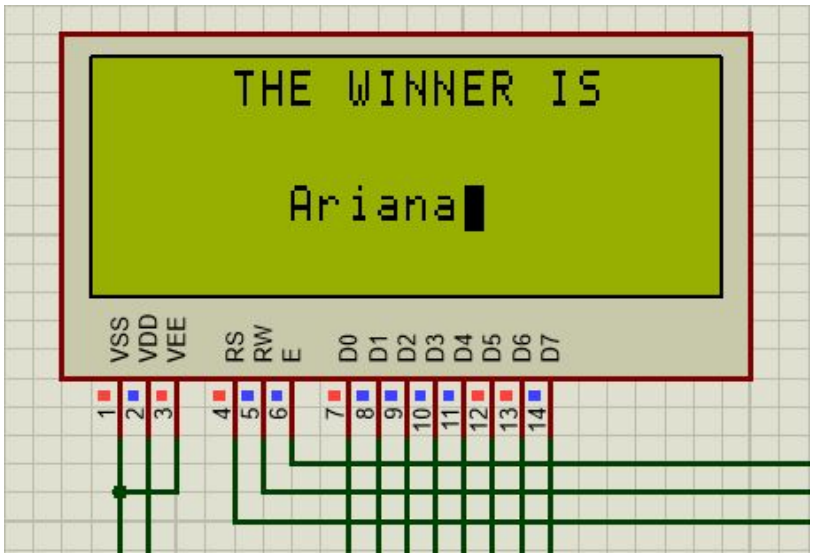
In the master menu, you will be able to see how much each candidate has voted until now after that you can enter the decision menu (**decisionMenu()** functions).



Here the master has 2 options.

1. Press number 1 and back to the main menu (not terminated)
2. Press number 2 and enter the winner announcement page (**winnerAnnouncement()** function) and the winner will be announced. After 7 seconds it will go to the info page.





Code

The code for this voting system (**voting_system.c**) is attached to the file.