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Circuit Design of Four Persons Voting Machine

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ABSTRACT

In this project, an Electronic Voting Machine system is proposed which is in operation as transparent as the digital system. Voting Machine responds on some flow of pulses coming from the switch operated by voter and produces the output of the counting values i.e. total casting votes of individual nominee and displays it.The machine is controlled manually to operate the system for successive voters and to ensure that a voter can give only one vote to his/her chosen candidate of the same position.The application of four-person voting machine in our life is very common, and mastering the working principle of four-person voting machine is of great significance for us to understand and master the voting machine.This course is designed to use the knowledge of digital electronics technology to make a four-person voting machine. In the Mulitisim software, an integrated circuit is used to connect to an LED digital tube through four 74LS183 and a 74LS48 chip, one to display the number of favorites; Then pass with the door and the non-gate, to achieve the judgment of pass or not. After simulation, it meets the function of four-person voting.

Keywords: four-person voting machine; 74LS183; 74LS84; LED digital tube

Introduction

A voting machine, which is a client in a voting system, is a voting device that represents voting or voting by a show of hands. When voting, the relevant participants only need to press the "yes" button on their respective voting machines, and the number of people who agree with them will be displayed on the display screen, and the display light will indicate whether the vote has passed.

This design is a voting display control circuit composed of an adder, a numerical comparator, and adecoding display circuit. The design ideais toindicate the respective resolution through the closed/disconnected state of the switch, closed means pass, and disconnection means vote; The voting machine needs to achieve the judgment of "whether to pass", and three or more people agree to pass, that is, A+B+C+D>2 or A+B+C+D≥3 pass, using an adder to achieve, and output with BCD code. The output is transmitted to the numerical comparator and the display decoder, respectively. A numerical comparator is used to compare the BCD code with 2 (0010) or 3 (0011), and the output is connected to a red and green LED to show whether the resolution was passed or not. The BCD code is translated using the display decoder and connected to an LED display to display the number of voters.

Component selection

5V DC power supply, 74LS48 decoder, Four 74LS183/74LS283/84(AND, OR-GATE and NOR-GATE), Comparator 74LS85 and LED Display/ Signal Tube

Composition of Circuit

It is composed of addition operation circuit, decoding and numerical comparison circuit, and result display circuit. According to the design tasks and requirements of the four-person voting device, and the basic composition of the four-person voting device circuit introduced in its overview, it can be seen thatthe four-personvotingdevice is composed ofa control circuit, an adder A numerical comparator Display decoder, Composed of a seven-segment character display.

Block Diagram

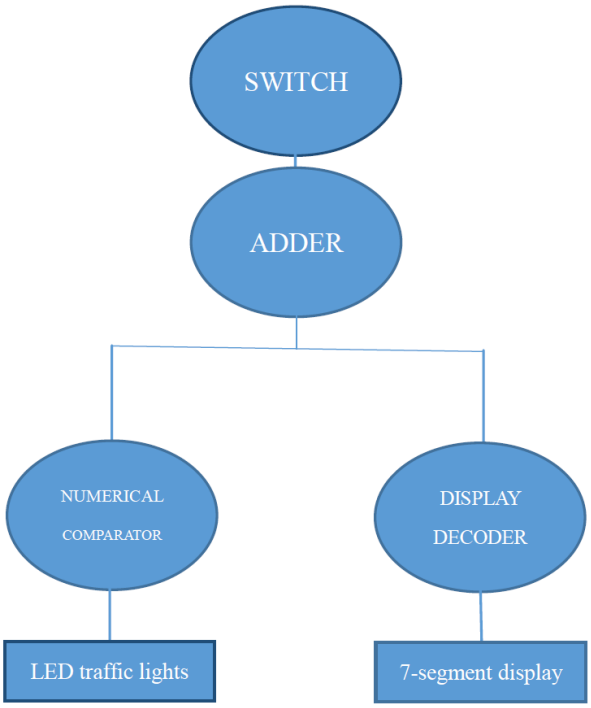


Figure 2.1 Block diagram ofa four-person voting machine

Working principle of four-person voting machine

The task of this design was to design a control circuit with four votes. Whenvoting starts, theadderstarts working,outputting BCDbinary code. When the numerical comparatorreceives the B CD code,it matches the BCD code withthe preset binary code 0010 Or 0011 for comparison, and the result output of the comparison size will be used, using the LEDtraffic light tube to indicate whether the vote passed. When the decoder receives the B CD code, the display translator translatesthe BCDcode, and the output drives a seven-segment character display to display the number of voters. Second, the design and analysis of each unit circuit

Adder section

The voting machine needs to achieve a "pass or not" judgment, and three or more people agree to pass, that is, A+B+C+D≥3 , so we use two full adders and a 4-bit over-forward bit adder, and output it in BCD code. Both the 74LS183 and 74LS283 belong to the adder, where CI represents the carry from the low bit, the high level is active, and CO represents the carry to the high bit, and the high level is active. The two input terminals of the first 74LS183 are connected to the A and B terminals respectively, the second is connected to the C and D terminals, the CI terminal is grounded, the CO end is connected to the 74LS283 end, and the output end is connected to the 74LS283 end respectively. The CI terminal of the 74LS283 and the,terminal are grounded. A schematic of the pins for the 74LS183 and 74LS283 is shown in Figure 2.4.1 and Figure 2.4.2. $A_1B_1A_0B_0A_2B_2$， A_3B_3

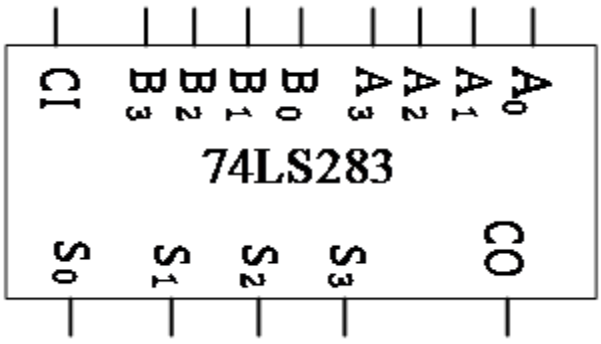


Figure 2.4.1 pin diagram of 74LS283

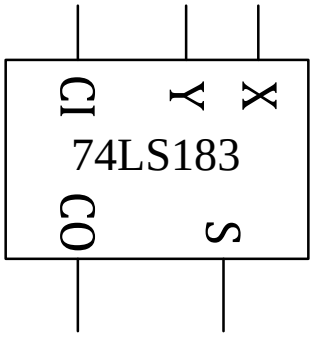


Figure 2.4.2 pin diagram of 74LS183

Display decoder section

The 7448 decoder is a seven-segment display decoder capable of driving a seven-segment display to display digital glyphs. The input ,,, receive a 4-bit binary code, which is connected to the output of the 74LS28, and the output$M_3M_2M_1M_0$OA, OB, OC, OD, OE, OF, OG drives the A, B, C, D, E, F, and g segments of the seven-segment display respectively. The lamp test input *LT*, zero off input *RBI*, connected to high level. When the lamp off input/zero off output BI/RBO=0, the decoder does not work, access the switch, and then connect to the high level to control whether the LED display is working.

LED display, common cathode, CK terminal grounded, driven by high level. A schematic of the pins of the 7448 decoder and seven-segment display is shown in Figure 2.5.

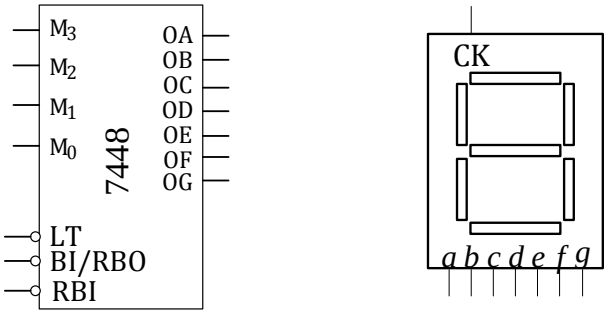


Figure 2.5. 7448 pin diagram and Seven-segment display pin diagram

Comparator - traffic light section

Multi-bit numerical comparator 74LS85 for comparing the size of two four-bit binary numbers. The output of the 74LS283 is connected to D 3, D 2, D 1, D_0, respectively, and compared with 0011, that is, C_3, C 2 is low, C1, C_0 are high. $I_{(C<D)}$, I ($_{(C=D),}$ $I(C_{>d})$ represent the comparison results of the anteriors, and I $_{(C<D)}$ and I $_{(C>D)}$ is grounded, and I $_{(C=D)}$ is connected to high. $Y_{(C<D),}$ $Y(_{(C=D),}$ Y(C>D) are the comparison results, if $Y_{(C>D)}$=1, the LED light is on, otherwise, the red light is on. A schematic of the pins of the 74LS85 is shown in Figure 2.6.

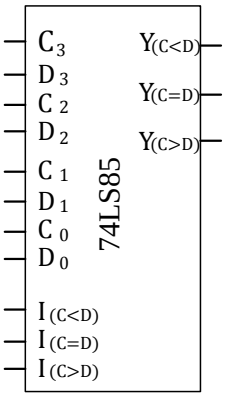


Fig 2.6 Schematic diagram of the 74LS85 pins

1. Circuit Design and simulation

Circuit simulation:

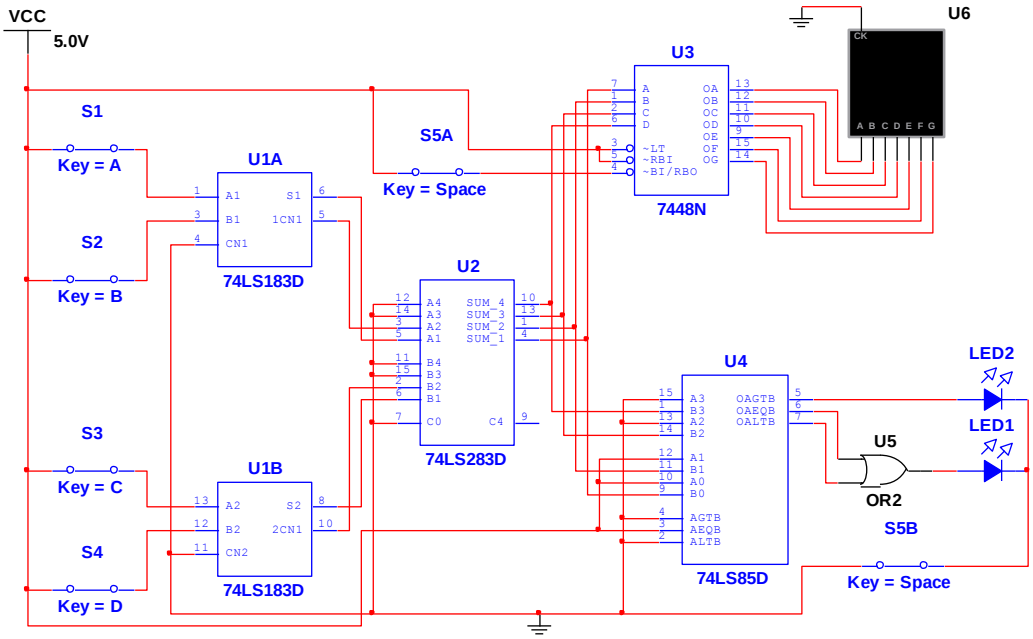
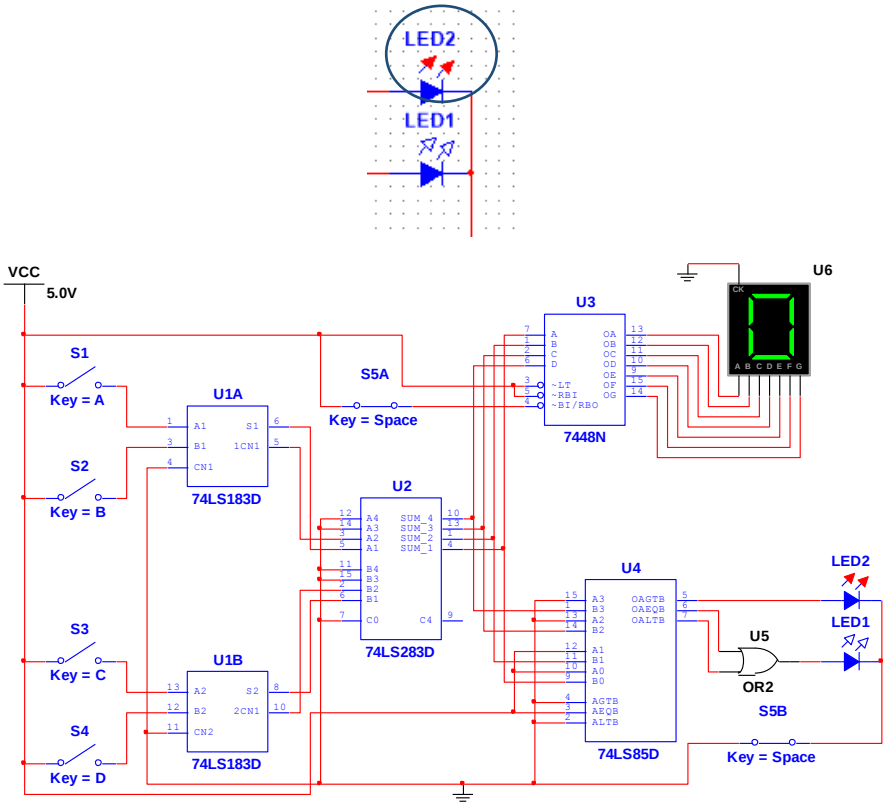


Fig 3.1 Circuit simulation of 4 person voting machine

Condition 01:

When no one agrees, all four switches are disconnected, the red light is on

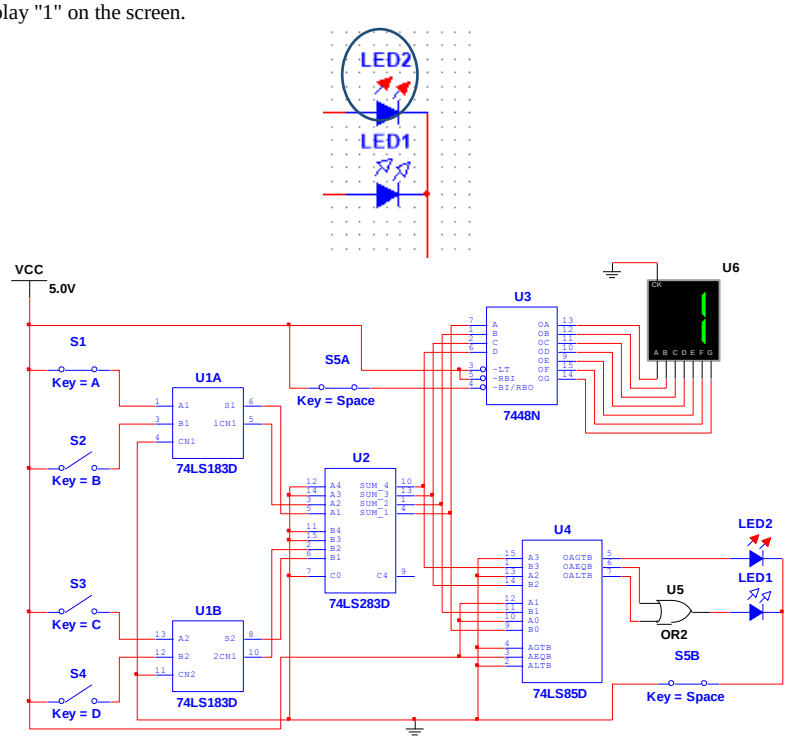
Seven-segment display "0" on it



Condition 02:

When one person agrees, He will close a switch, the red light is on.

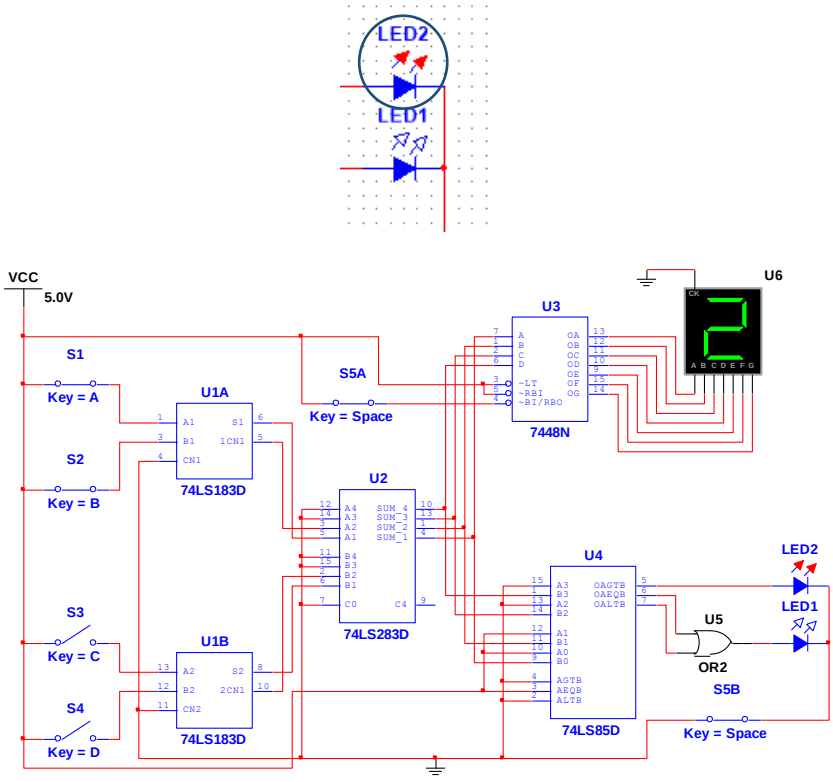
Seven-segment character display "1" on the screen.



Condition 03:

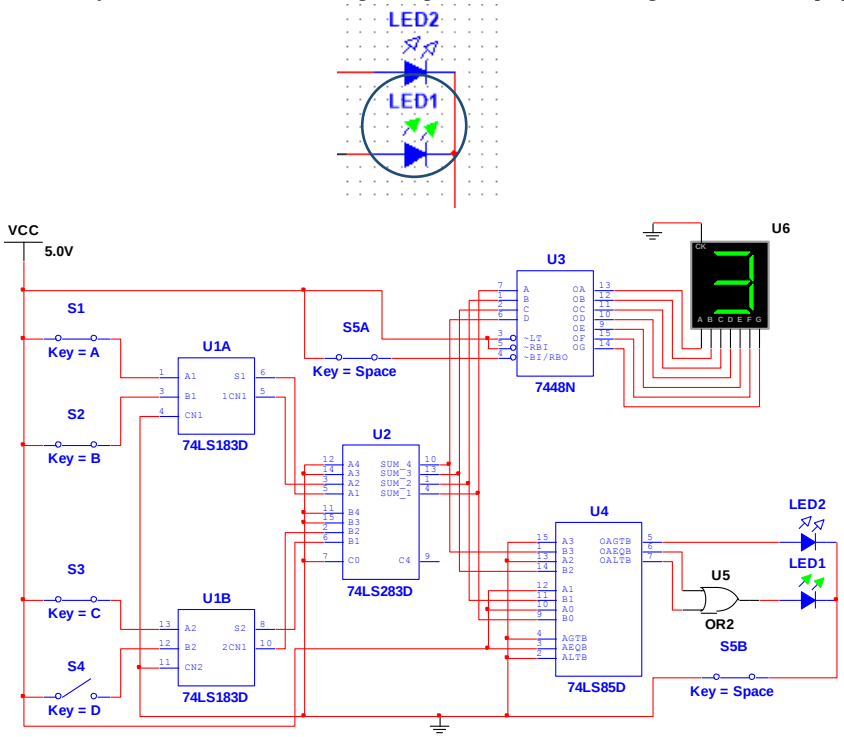
When the two agree, They will close the two switches, Red light turn on.

Seven-segment character display is "2".



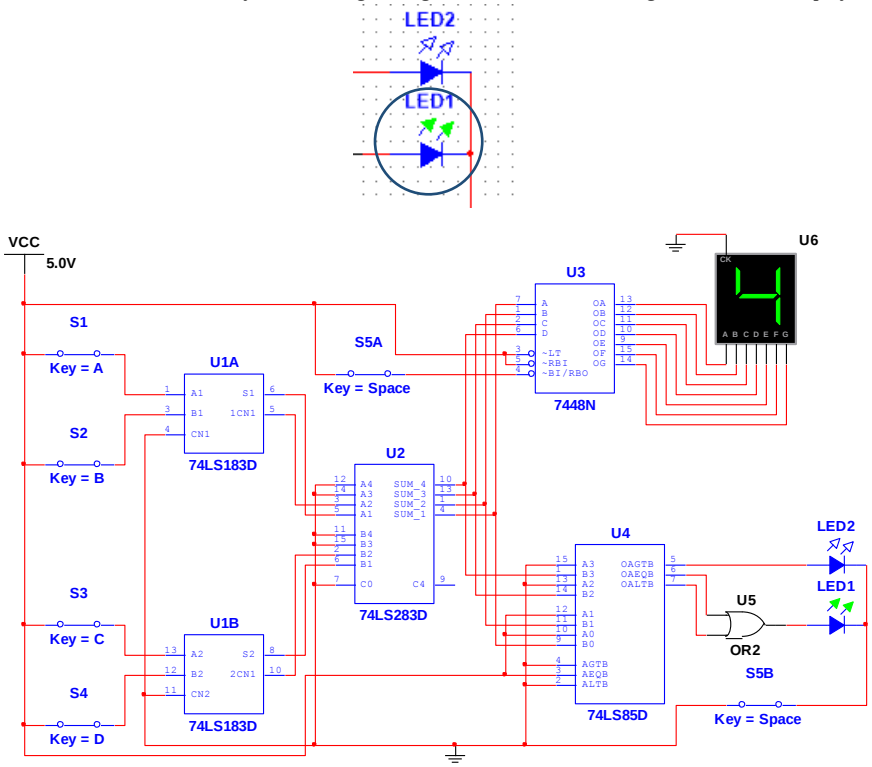
Condition 04:

When the three people agree, arbitrarily close the three switches, the green light is on, and the seven-segment character display is "3".



Condition 05:

When the four people agree, the four switches are fully closed, the green light is on, and the seven-segment character display is "4".



Summary

Objective of this project:

- Getting familiar with components used in this project.

- Working principle of all the components and this device.
- Reviewing the existing/current voting process or approach.
- Coming up with an automated voting system.
- Implementing a an automated/online voting system.

This circuit design makes us understand that this circuit is mainly composed of adder, numerical comparator, decoder, digital display, and LED lamp.

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