

Project: 4 Bit Password Security System using Logic Gates.

Introduction

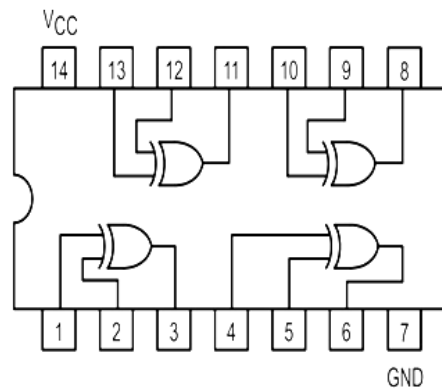
Our project is about to build a password security system. There will be an admin password and user password of 4 bits. If user gives the right password, then the blue light will be on, and a 7-segment display will show how many times the right password has been given. If a user gives wrong password, then the red light will be on and if the wrong password will be given for 4 times, then a buzzer will buzz.

Equipment

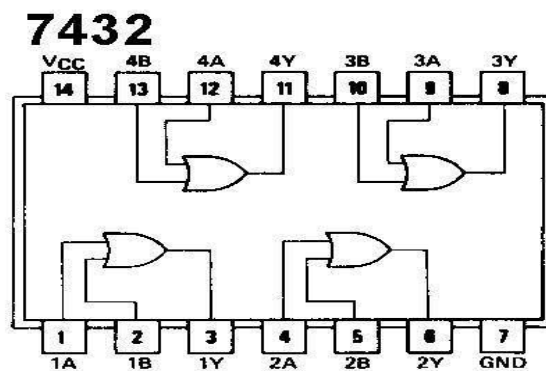
1. Switch.
2. 7486-2 input X-OR.
3. 7432-2 input OR.
4. 7404-2 input NOT.
5. 7421-4 input AND.
6. 7408-2 input AND.
7. 4027-J-K Flip Flop.
8. 4026 –Counter.
9. 7 segment common cathode display.
10. LED small lights (green, red).
11. Battery (9V).
12. 7805- 5-volt regulator IC.
13. Buzzer.
14. Wires, breadboards.

Procedure

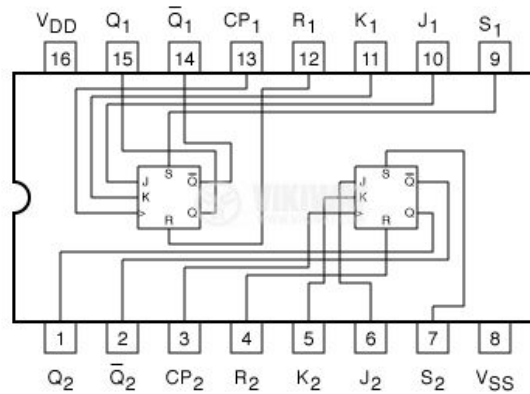
1. We have used 8 switches, 4 is for user and 4 is for admin. Firstly we have connected the 1st input of both user and admin switch then 2nd input of both user and admin switch, 3rd input of both user and admin switch and 4th input of both user and admin switch to the 7486 X-OR gate IC. This is one of the steps to define wrong password. We connect the inputs by following the diagram is given below.



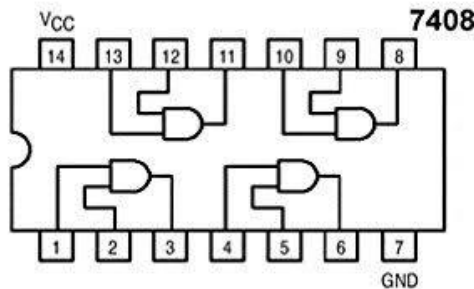
2. Then we have connected the first 2 outputs of X-OR gate to pin 1 and 2 of a 7432 OR gate IC. Then the next two outputs of X-OR gate are connected with pin 9 and 10 of the OR gate. Then the Outputs of the OR gate which are from pins 8 and 3 are connected to the pin 4 and 5 of the OR gate. We connected a red light to the final output of the OR gate at the pin 6. So, as we know that X-OR gate gives output 1 only if the inputs are different to one another. So, if the user gives wrong password, then the X-OR gate will give 1 to the output as a result the OR gate will give output 1. Then the red light will be on.



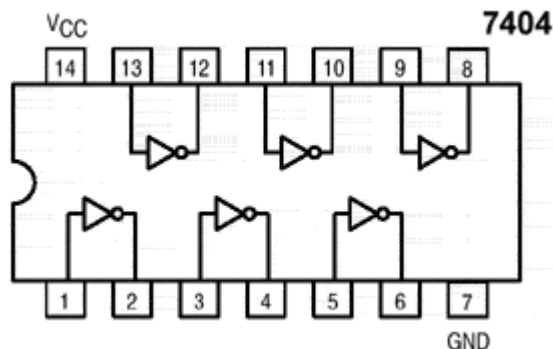
- Then we have connected the final output of the OR gate to 4027 dual J-K flip flop IC. To count for 2 bits, we have used two JK flip flops which are built in one 4027 IC. We keep J and K 1 so the output will toggle at the positive edge of the clock as the IC is positive triggered. Then we have connected the final output of the OR gate to the 1st clock and connected Q1' as the clock of the 2nd flip flop. This will count (00,01,10,11) where Q2 is MSB and Q1 is LSB.



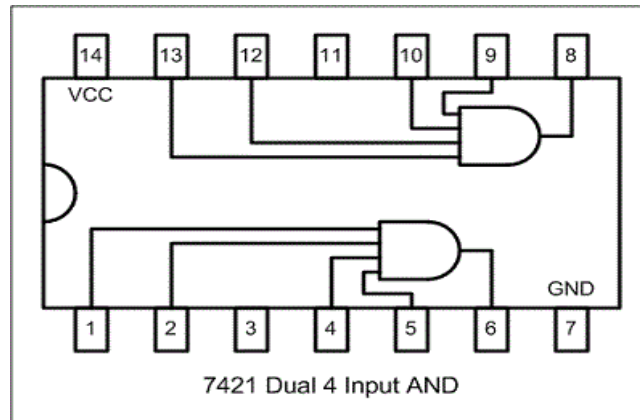
- Then we have connected the outputs Q1 and Q2 of the 4027 IC as inputs to a 7408 AND gate and connected the output to a buzzer .So when counter will count (1,1) then output of the AND will be 1 and the buzzer will buzz.



- Then we have connected the outputs of X-OR gate (7486) to the inputs of a 2 input NOT gate (7404).



7. Then we have connected the outputs of the NOT gate (7404) to the input of the 4 input AND gate (7421).



As we know that if the inputs of a X-NOR gate are same then the output remains same. Then we have connected all the outputs to the input of an AND gate. If the admin password and user password matches, then the final output of the AND gate will be 1. We have connected a blue LED at the final output. If the password matches, then the blue LED will be on.

8. Then we have used a counter IC (4026) to count the number of times given password is correct. We have used only one counter IC. We have connected the blue LED to the clock of the IC. Then we have connected the (a,b,c,d,e,f,g) to the corresponding (a,b,c,d,e,f,g) of the 7 segment display. As we have used a common cathode display, we connected the (com) pin to ground.

