DEPARTMENT OF ELECTRONICS
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DIGITAL SYSTEMS DESIGN
BECE102L

SEQUENTIAL PASSWORD PROTECTOR

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Introduction

The "Sequential Password Protector " aims to bolster digital system security through the application of fundamental digital logic principles. By employing 8-bit character passwords and utilizing logic gates, Multiplexers, Encoders, Decoders, Demultiplexers, Flipflops and Adders. This project establishes a robust password protection mechanism. Users must input the correct binary sequence to gain access, offering a considerable degree of security. This endeavor underscores the importance of comprehending digital logic's role in safeguarding digital systems. While it provides a rudimentary solution, it serves as a stepping-stone for more advanced security implementations. By blending theoretical foundations with practical application, this project contributes significantly to the domain of digital system security, paving the way for future advancements in the field. It has a wide array of applications in a variety of fields including but not limited to

1. **Computer and Network Security:** The device can be used as an additional layer of security in computer systems and networks. Users would need to input the correct 8-bit character password sequence to gain access to sensitive data, applications, or network resources. This can help protect against unauthorized access and data breaches.

2. **Physical Access Control:** Beyond digital systems, the device could be adapted for physical access control, such as securing doors, safes, or restricted areas. Users would need to enter the correct sequence to unlock doors or access specific physical locations, enhancing security in buildings or facilities.\

3. **Industrial Control Systems:** In industrial settings, the device can be employed to control access to critical machinery, equipment, or control systems. By requiring the correct 8-bit character password sequence, it can prevent unauthorized personnel from tampering with industrial processes, ensuring safety and operational integrity.

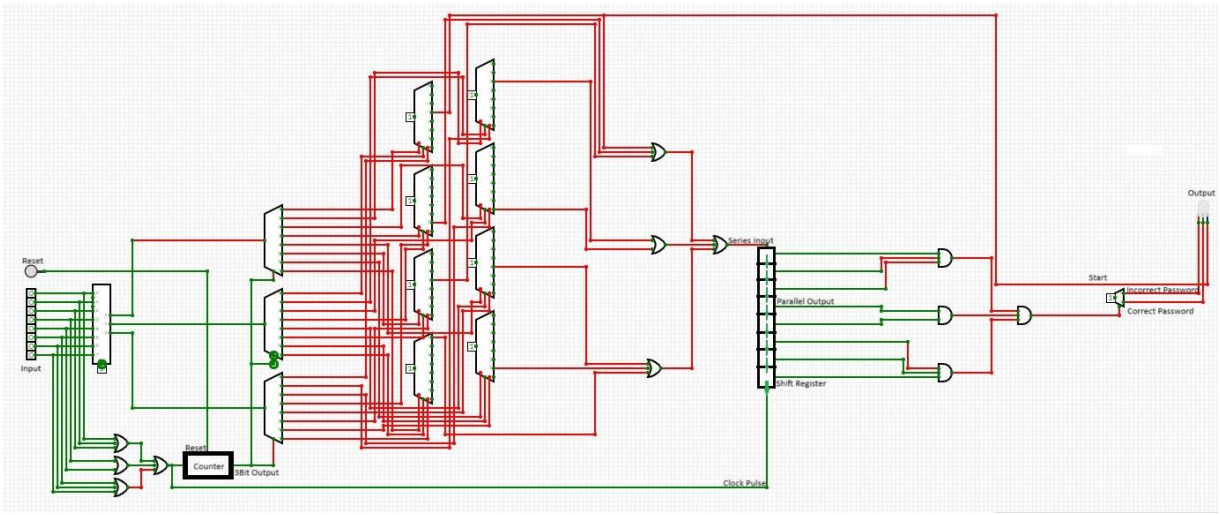
4. **Data Encryption Key Management:** The device can serve as a part of a multi-factor authentication system for accessing encrypted data. Users would need to provide the correct password sequence as one of the authentication factors before gaining access to sensitive information. This can be particularly valuable in securing confidential data in storage or during transmission.

5. **Secure Document Storage:** It can be used in applications where secure document storage is crucial, such as government agencies, financial institutions, or legal firms. The device could be integrated into secure file cabinets or storage units, ensuring that only authorized individuals can access sensitive documents.

Components

- Single Core Breadboard Jumper Hookup Wire
- Wire Cutter
- Breadboards
- Push Buttons
- (1:8 Demultiplexer) IC74138
- (4-Bit Binary Counter) IC74193
- (Serial-In-Parallel-Out Shift Register) IC74164
- (8:3 Priority Encoder) IC74148
- (2-Input AND Gate) IC7408
- (3-Input AND Gate) IC7411
- (2-Input OR Gate) IC7432
- (3-Input OR Gate) IC4075
- Red LED
- Green LED
- Resistors
- (D-Flipflop) IC7474
- 5V (Battery) Voltage Source
- (9V-5V Voltage Regulator) IC7805
- (2-Input NOT Gate) IC7404

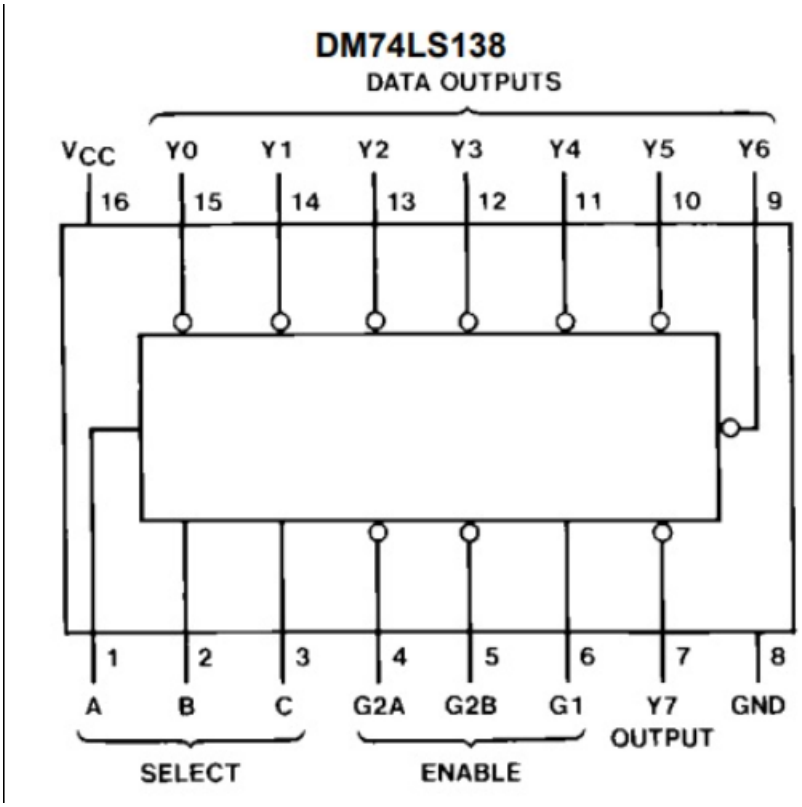
Circuit Diagram



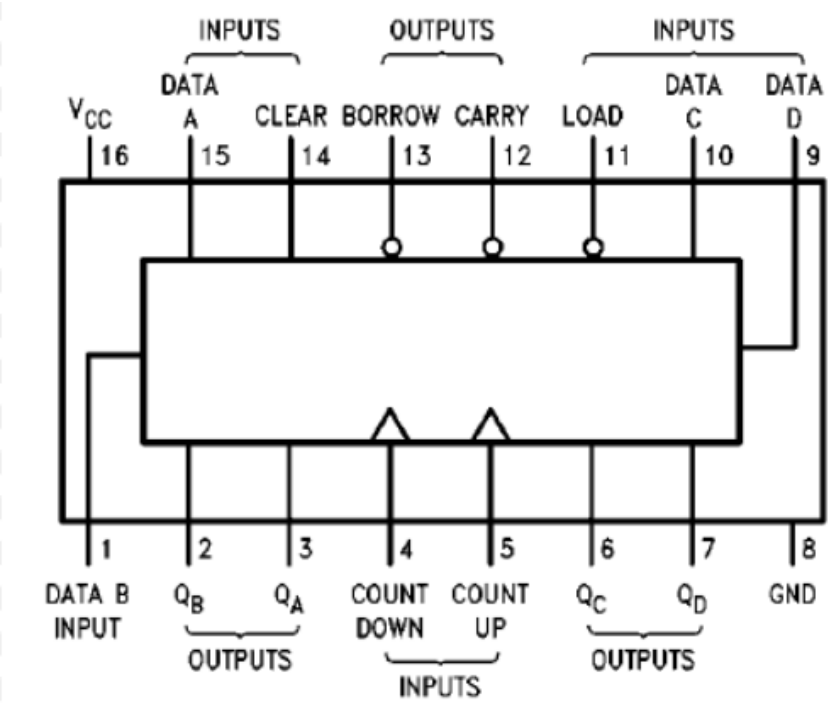
Data Sheets

IC74138

INPUTS						OUTPUTS							
$\overline{E_1}$	$\overline{E_2}$	E_3	A_0	A_1	A_2	Y_0	Y_1	Y_2	Y_3	Y_4	Y_5	Y_6	Y_7
H	X	X	X	X	X	H	H	H	H	H	H	H	H
X	H	X	X	X	X	H	H	H	H	H	H	H	H
X	X	L	X	X	X	H	H	H	H	H	H	H	H
L	L	H	L	L	L	L	H	H	H	H	H	H	H
L	L	H	H	L	L	H	L	H	H	H	H	H	H
L	L	H	L	H	L	H	H	L	H	H	H	H	H
L	L	H	H	H	L	H	H	H	L	H	H	H	H
L	L	H	L	L	H	H	H	H	H	L	H	H	H
L	L	H	H	L	H	H	H	H	H	H	L	H	H
L	L	H	L	H	H	H	H	H	H	H	H	L	H
L	L	H	H	H	H	H	H	H	H	H	H	H	L

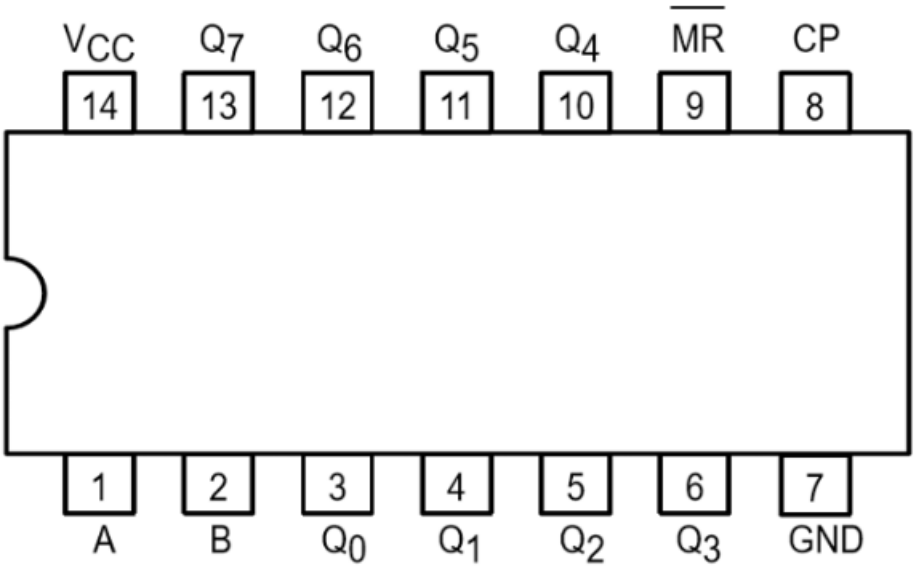


IC74193



COUNT	OUTPUT			
	Q_0	Q_1	Q_2	Q_3
0	L	L	L	L
1	H	L	L	L
2	L	H	L	L
3	H	H	L	L
4	L	L	H	L
5	H	L	H	L
6	L	H	H	L
7	H	H	H	L
8	L	L	L	H
9	H	L	L	H
10	L	H	L	H
11	H	H	L	H
12	L	L	H	H
13	H	L	H	H
14	L	H	H	H
15	H	H	H	H

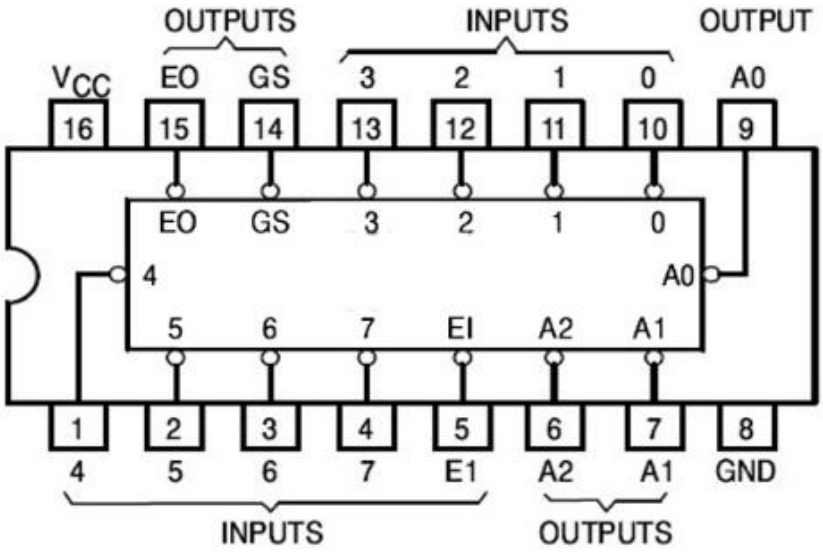
IC74164



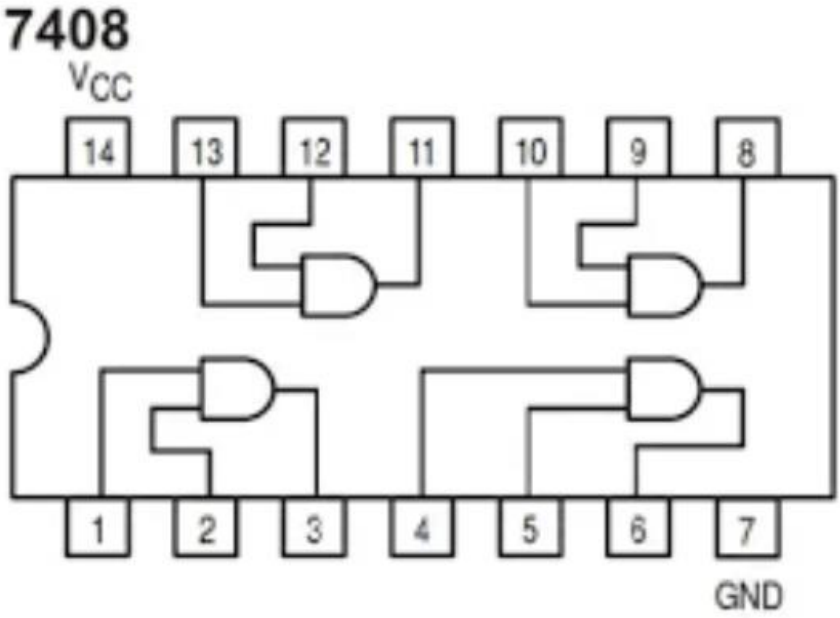
IC74148

INPUTS									OUTPUTS				
EI	0	1	2	3	4	5	6	7	A2	A1	A0	GS	EO
H	X	X	X	X	X	X	X	X	H	H	H	H	H
L	H	H	H	H	H	H	H	H	H	H	H	H	L
L	X	X	X	X	X	X	X	L	L	L	L	L	H
L	X	X	X	X	X	X	L	H	L	L	H	L	H
L	X	X	X	X	X	L	H	H	L	H	L	L	H
L	X	X	X	X	L	H	H	H	L	H	H	L	H
L	X	X	X	L	H	H	H	H	H	L	L	L	H
L	X	X	L	H	H	H	H	H	H	L	H	L	H
L	X	L	H	H	H	H	H	H	H	H	L	L	H
L	L	H	H	H	H	H	H	H	H	H	H	L	H

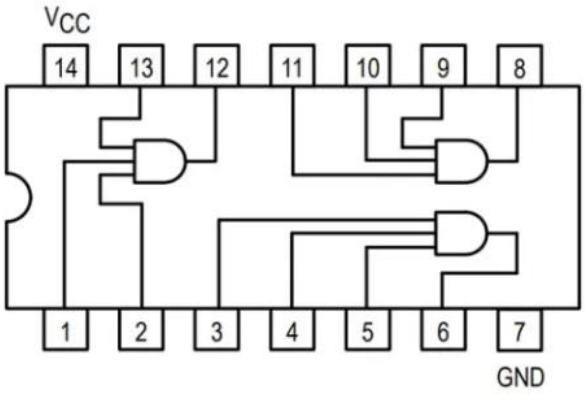
H = high logic level, L = low logic level, X = irrelevant


OUTPUTS
INPUTS
OUTPUT
VCC
EO
GS
3
2
1
0
A0
16
15
14
13
12
11
10
9
EO
GS
3
2
1
0
4
A0
5
6
7
EI
A2
A1
1
2
3
4
5
6
7
8
4
5
6
7
E1
A2
A1
GND
INPUTS
OUTPUTS

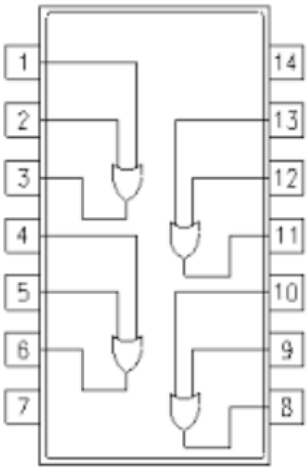
IC7408


7408
VCC
14
13
12
11
10
9
8
1
2
3
4
5
6
7
GND

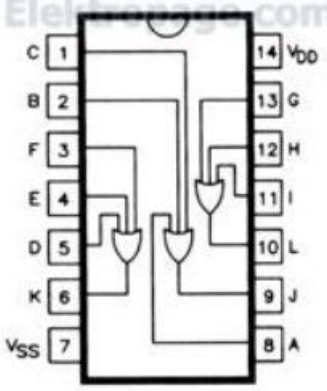
IC7411



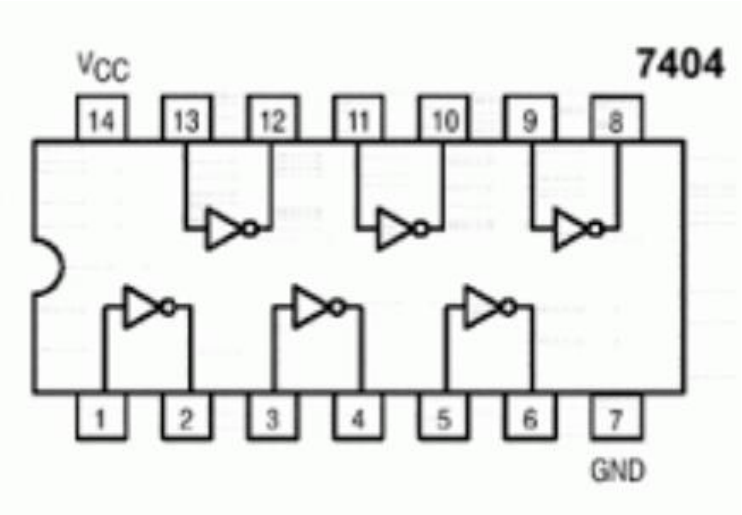
IC7432



IC4075



IC7404



IC7805