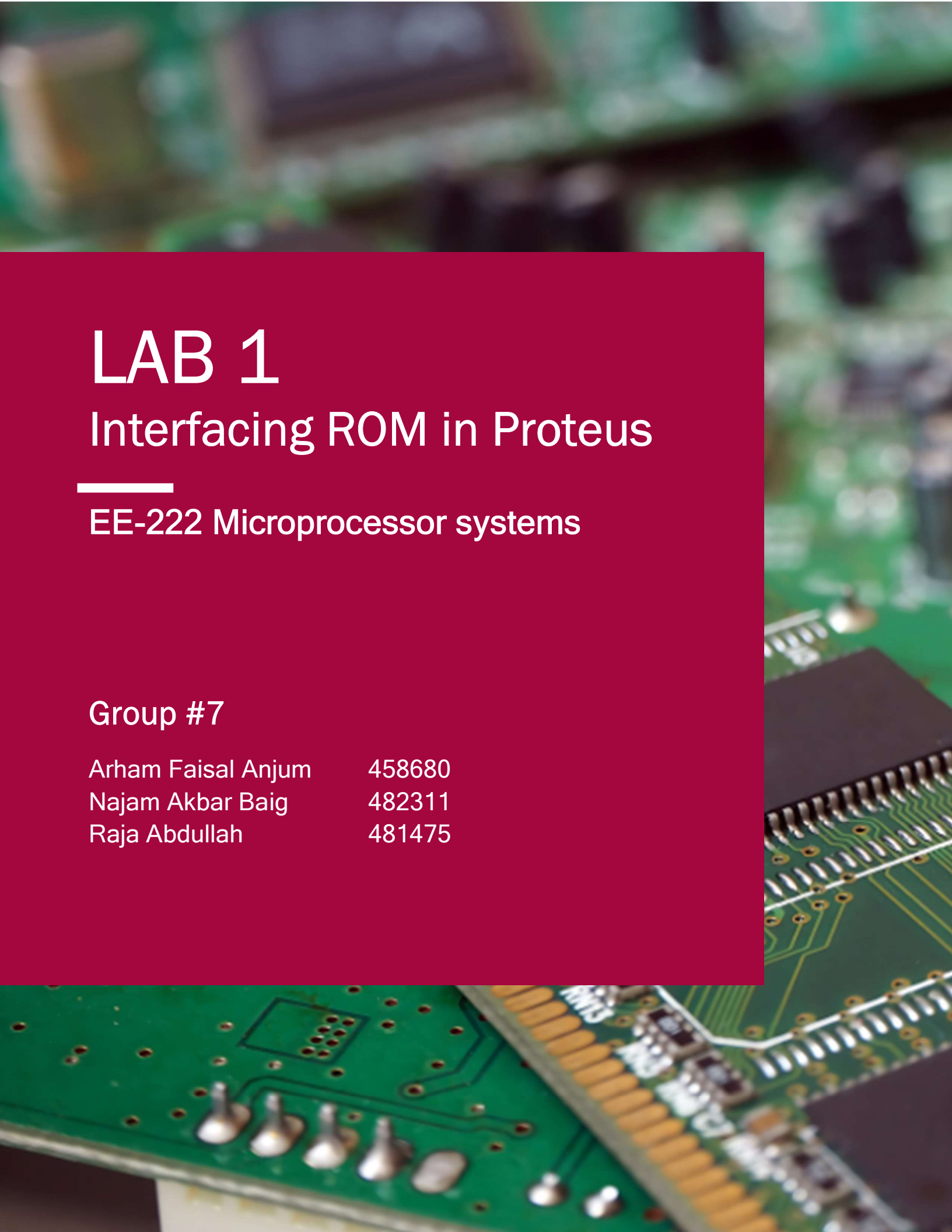

LAB 1

Interfacing ROM in Proteus

EE-222 Microprocessor systems

Group #7

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Raja Abdullah	481475

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Abstract

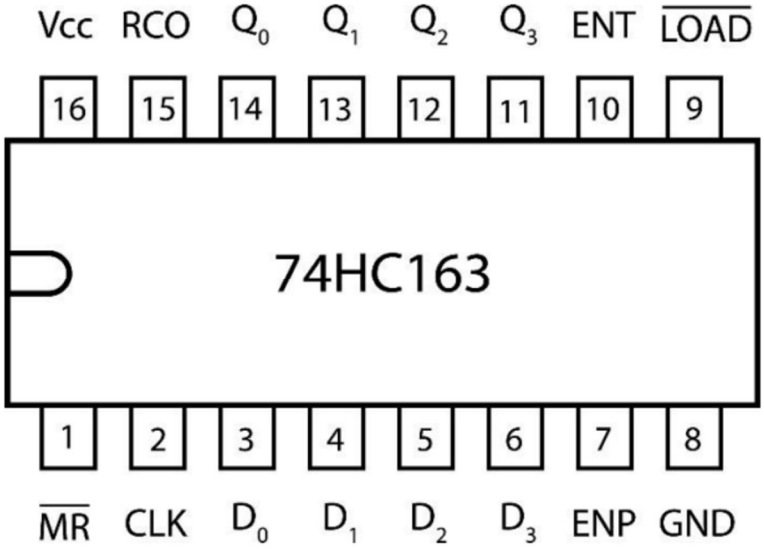
Read Only Memory (ROM) is a storage device which stores binary data. Data is stored in separate memory locations which have their own unique addresses. The objective of this task is to interface ROM in proteus. The ROM used is a 512kbit EPROM (Erasable Programmable ROM). It has 16 address pins which allows access to 2^{16} memory locations and 8 output pins which indicates that each address can store 8 bits.

Data is sourced from a binary text file. The ASCII code of each character is stored in a separate memory address in the ROM. The memory addresses are sequentially accessed using four 4-bit synchronous binary counters and the data in each address is displayed using two 7 segment BCD displays.

Components used

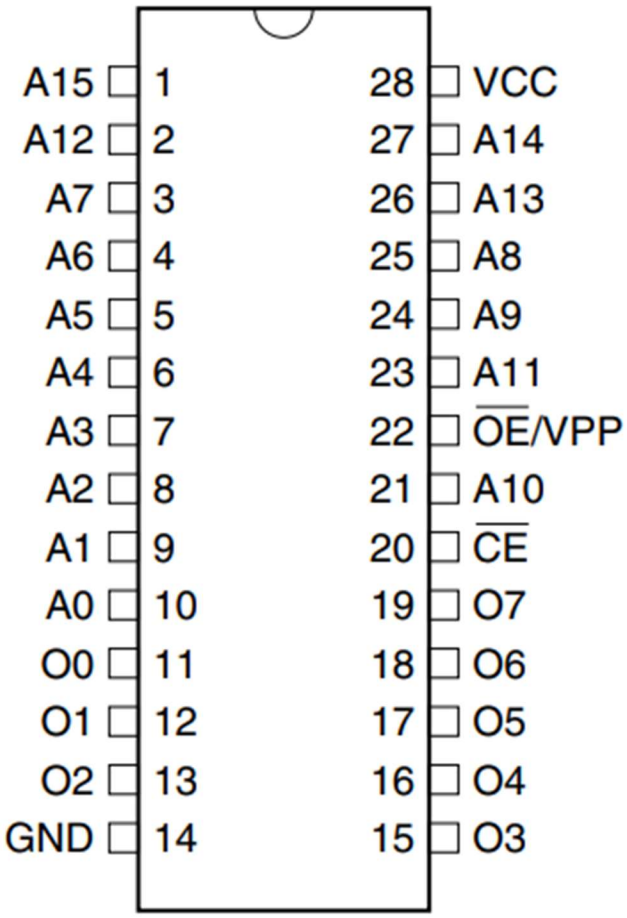
Name	Description
IC 74HC163	4-bit synchronous binary counter
IC 27C512	512 Kbit EPROM
7SEG-BCD	7-segment BCD display

IC 74HC163



Symbol	Pin	Description
MR	1	Master Reset (Active low)
CLK	2	Clock input
D0, D1, D2, D3	3,4,5,6	Binary data input
ENP	7	Count enable input
GND	8	Ground
LOAD	9	Load (Active low)
ENT	10	Count enable carry input
Q0, Q1, Q2, Q3	14,13,12,11	Binary counter output
RCO	15	Carry out/Terminal count output
V_{CC}	16	Supply voltage

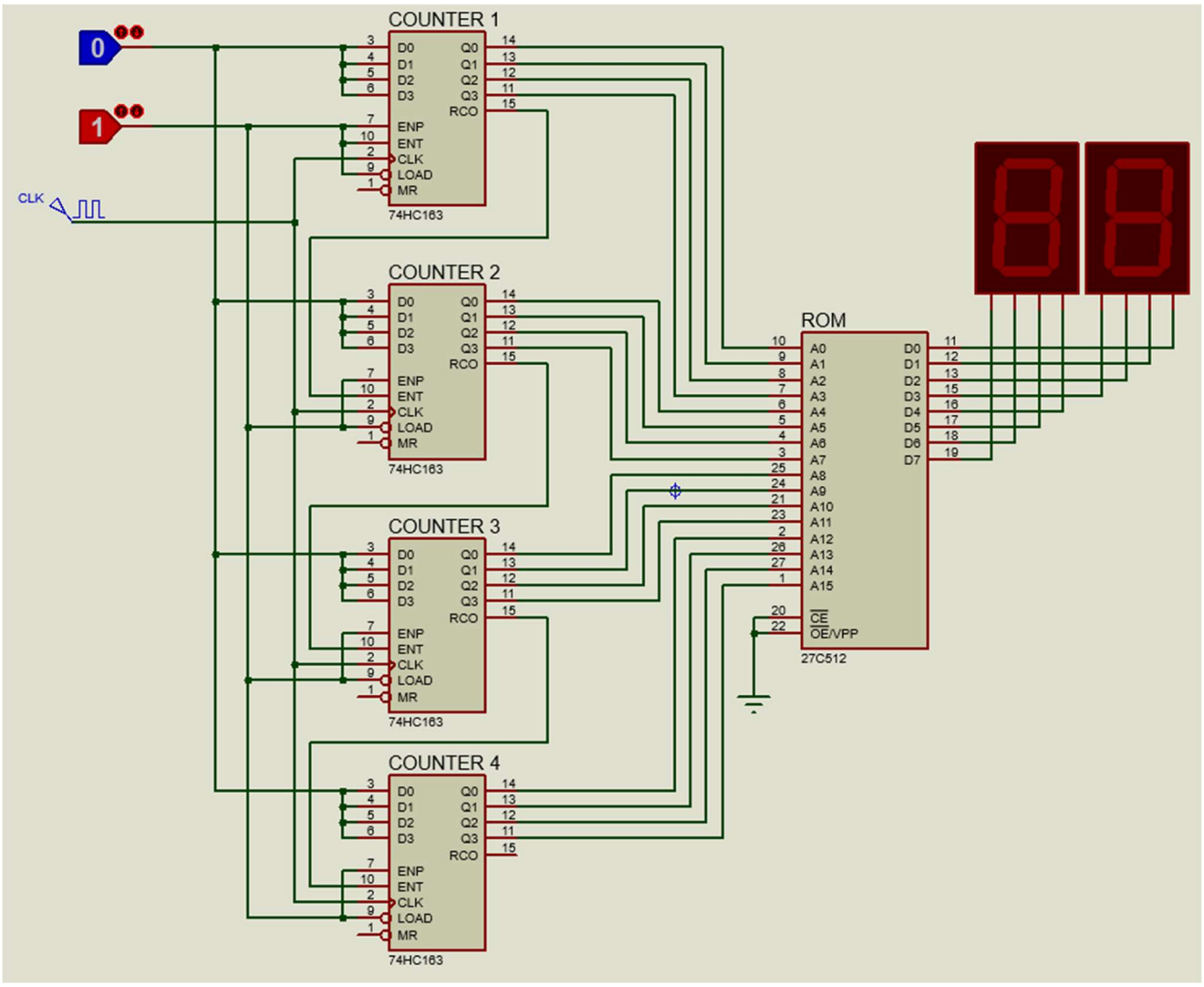
IC 27C512



Symbol	Pin	Description
A0, A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14, A15	10, 9, 8, 7, 6, 5, 4, 3, 25, 24, 21, 23, 2, 26, 27, 1	Binary Address Input
GND	14	Ground
O0, O1, O2, O3, O4, O5, O6, O7	11, 12, 13, 15, 16, 17, 18, 19	Binary data output
CE	20	Chip enable (Active low)
OE	22	Output enable (Active low)
V_{CC}	28	Supply voltage

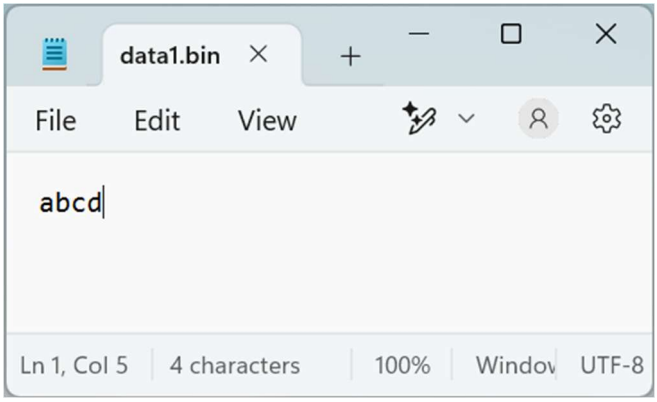
Simulation

Circuit

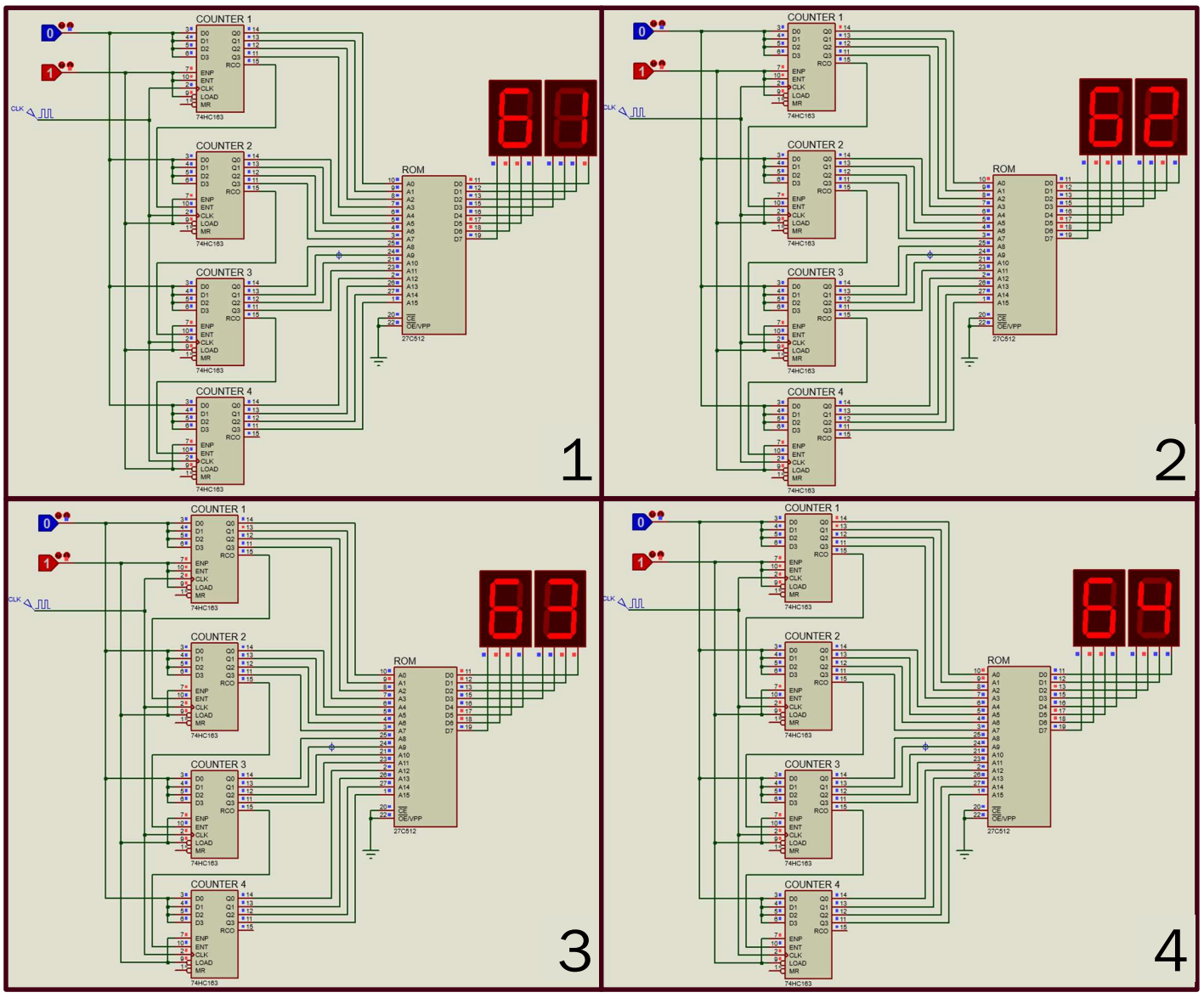


Writing content in memory and reading contents via memory chip

Data in memory:



Output:

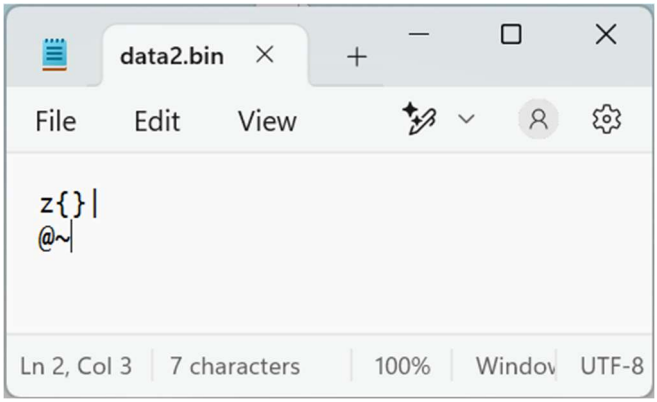


Display the following sequence

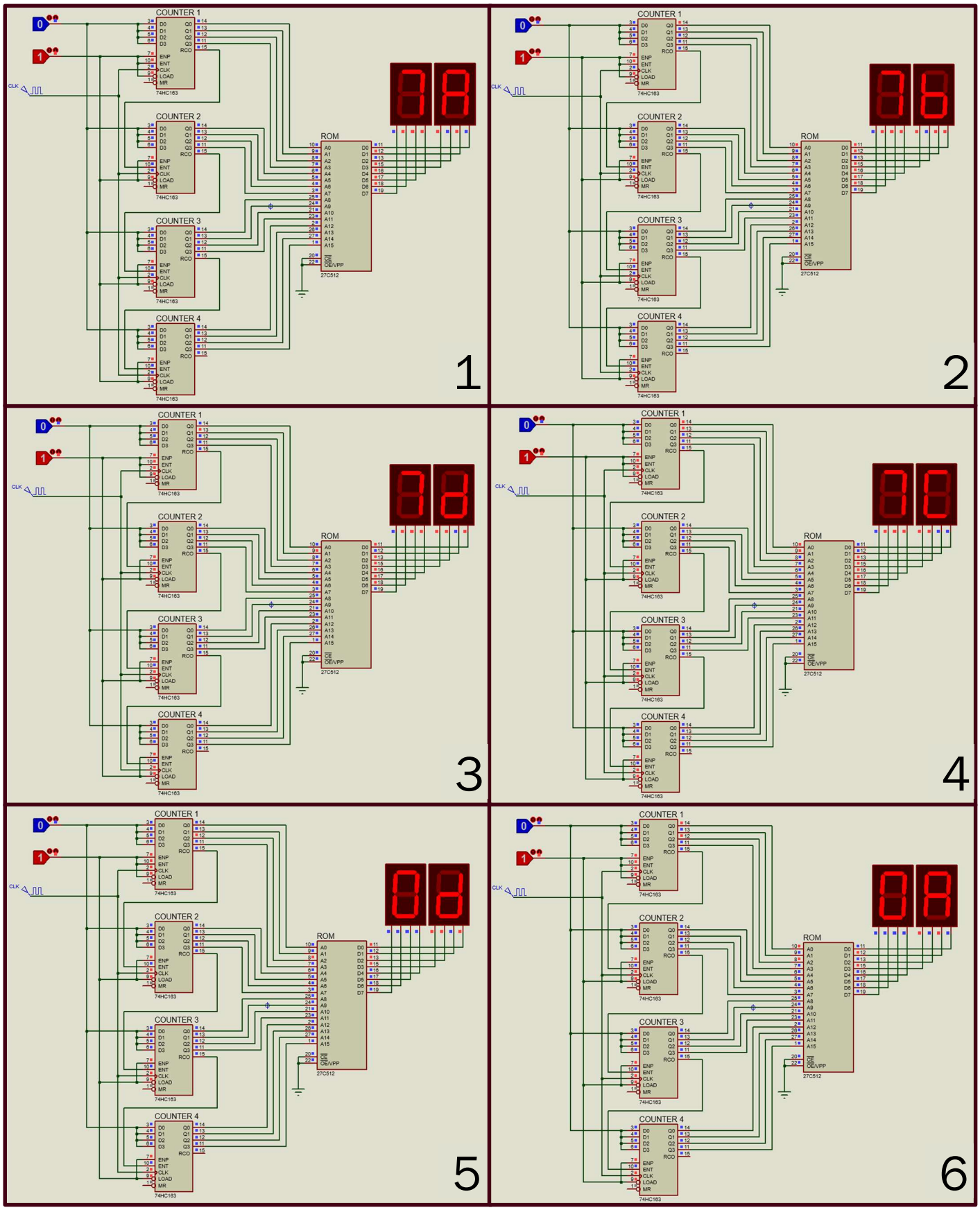
7A, 7B, 7D, 7C, 0D, 0A, 40, 7E

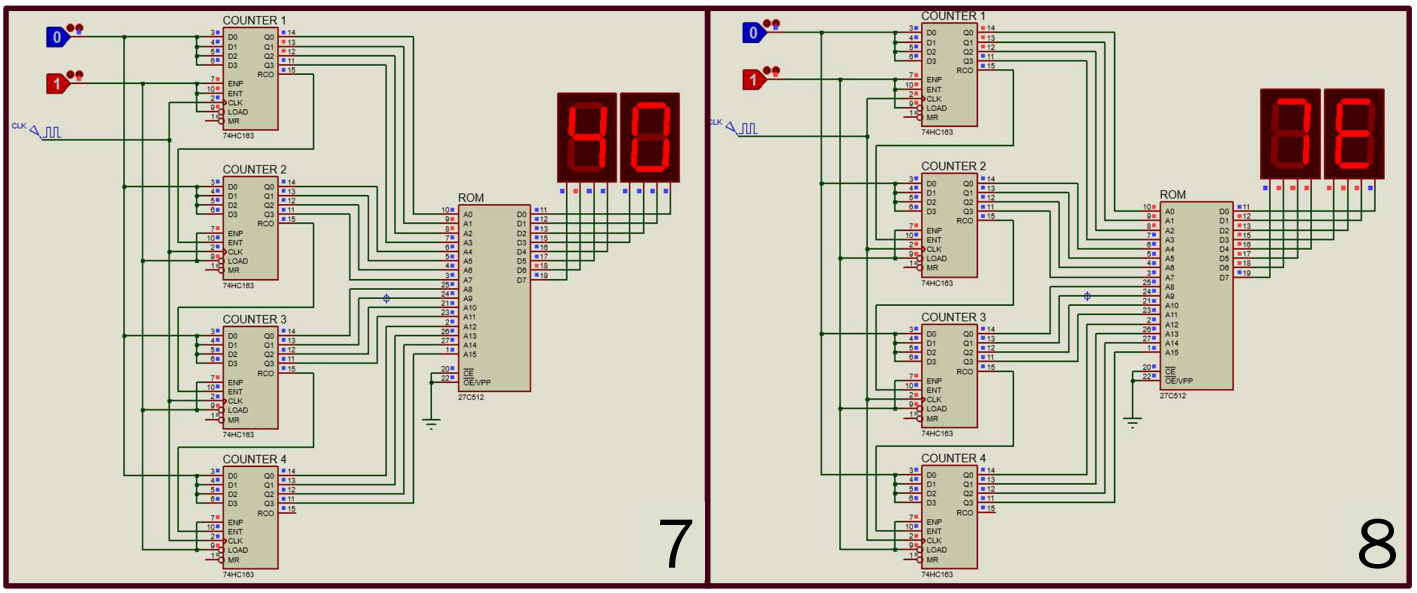
Data in memory:

ASCII (hex)	Character	Description
7A	z	Lowercase letter z
7B	{	Opening curly bracket
7D	}	Closing curly bracket
7C	|	Pipe
0D	CR	Carriage return
0A	LF	Line feed
40	@	At symbol
7E	~	Tilde



Output:


COUNTER 1
COUNTER 2
COUNTER 3
COUNTER 4
ROM
74HC163
27C512
CLK
1
2
3
4
5
6


COUNTER 1
COUNTER 2
COUNTER 3
COUNTER 4
ROM
74HC163
27C512
CLK
7
8