
CHAPTER 1

INTRODUCTION

Digital system

Digital information: discrete, not continuous, values

Binary digital system: two discrete values

Two different states:	0	1
	High	Low
	On	Off
	True	False

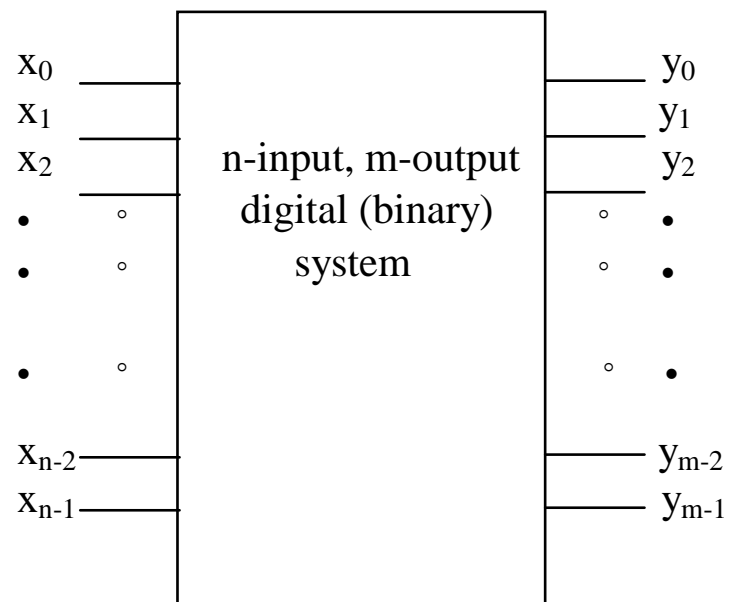


Figure 1.1 Block representation of a digital system.



Positive Logic:	High – 1	Low – 0
Negative Logic:	High – 0	Low – 1

Table 1.1 Truth table for a binary system with n inputs and m outputs.

Inputs							Outputs						
x_{n-1}	x_{n-2}	x_{n-3}	.....	x_2	x_1	x_0	y_{m-1}	y_{m-2}	y_{m-3}	.....	y_2	y_1	y_0
0	0	0	.....	0	0	0							
0	0	0	.....	0	0	1							
0	0	0	.....	0	1	0							
0	0	0	.....	0	1	1							
0	0	0	.....	1	0	0							
												
												
												
1	1	1	.....	0	1	1							
1	1	1	.....	1	0	0							
1	1	1	.....	1	0	1							
1	1	1	.....	1	1	0							
1	1	1	.....	1	1	1							

Output values depends on functions of system

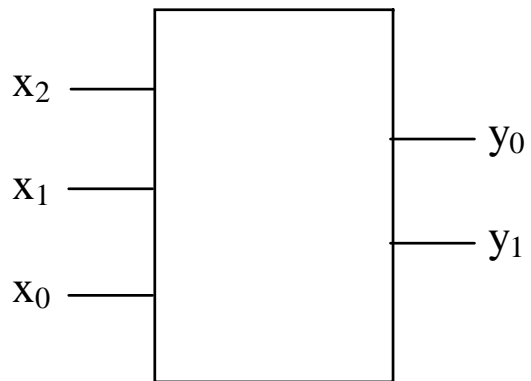


Figure 1.3 A 3-input, 2-output binary circuit.

Table 1.2 Truth table for the circuit in Figure 1.3.

x_2	x_1	x_0	y_1	y_0
0	0	0	0	0
0	0	1	0	1
0	1	0	0	1
0	1	1	1	0
1	0	0	0	1
1	0	1	1	0
1	1	0	1	0
1	1	1	1	1

Combinational Circuits and Sequential Circuits

Combinational circuits: Outputs depend on present inputs

Sequential circuits: Outputs depend on present inputs as well as past inputs

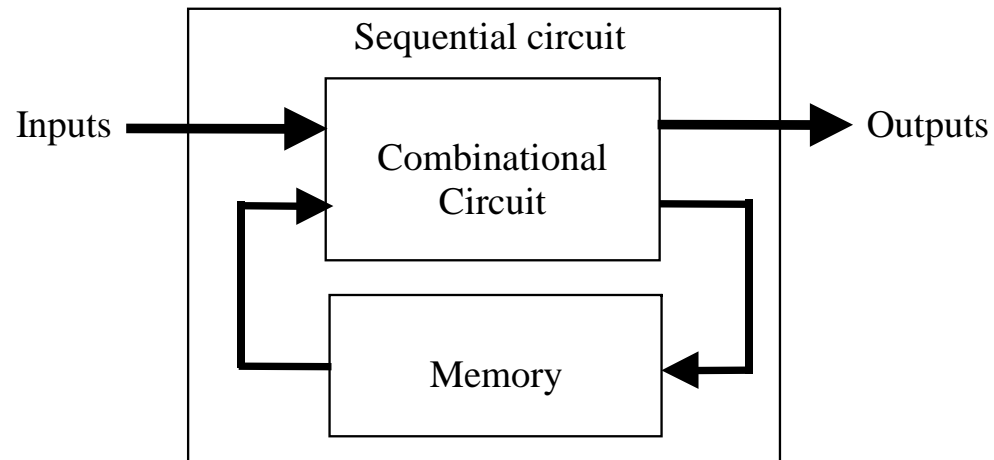


Figure 1.5 Structure of a sequential circuit.

Asynchronous sequential circuits

Synchronous sequential circuits