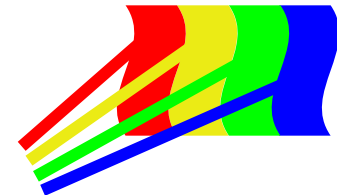
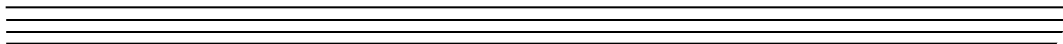


Digital Electronics

Principles & Applications

Seventh Edition

Arithmetic Circuits



INTRODUCTION

- **Binary Addition**
- **Half Adders**

Binary Addition

- Conceptually similar to decimal addition
- *Example:* Add the binary numbers 1010 and 11

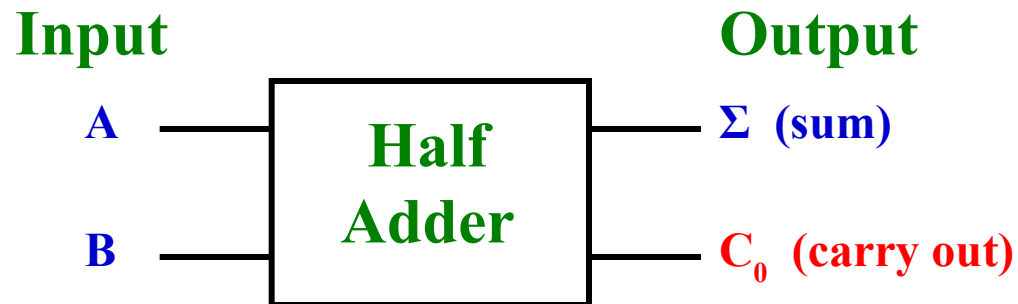
A diagram illustrating the binary addition of 1010 and 11. The numbers are aligned vertically, with 1010 on top and 11 below it. A horizontal line separates the addends from the result. The result, 1101, is written below the line. A red curved arrow labeled '(carry) 1' indicates the carry from the second column (from right to left) to the third column.

$$\begin{array}{r} \text{(carry)} \\ 1 \\ 1010 \\ + \quad 11 \\ \hline 1101 \end{array}$$

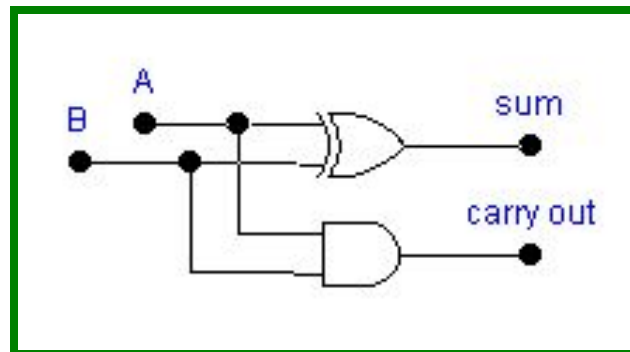
Half Adder

- Logic device that adds two binary numbers
- Only adds Least Significant Digit (LSD) column (1s column) in binary addition

Logic
Symbol:

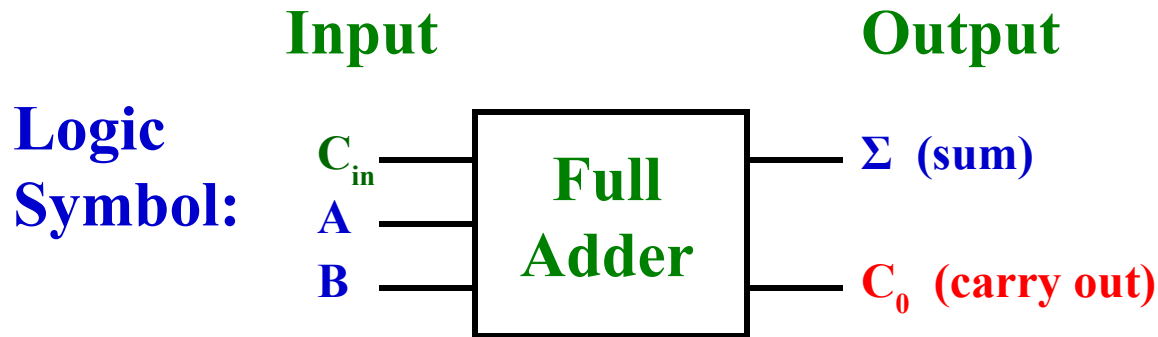


Logic
Diagram:



Full Adder

Used for adding binary place values other than the 1s place



Logic Diagram:

