Digital Design Learning of **Arithmetic circuits** with Deeds

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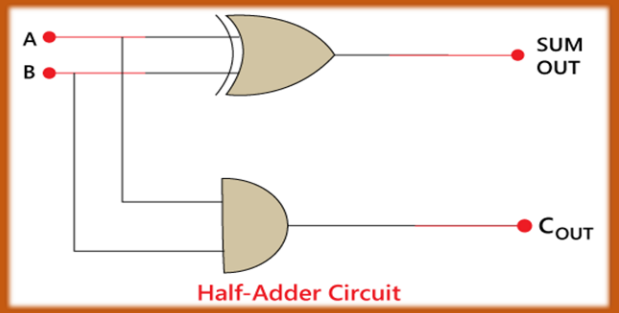

diagram 1.

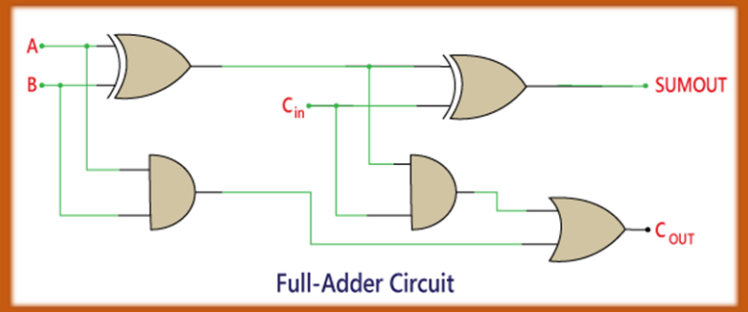

diagram 2.

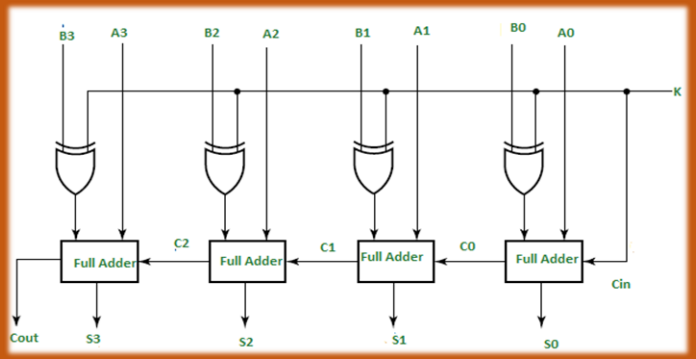

diagram 3.

Definition

An arithmetic circuit is a set of gates with a separate set of inputs for each number that has to be processed. The gates are connected so as to carry out an arithmetic action and the outputs of the gate circuit are the digits of the result (addition, subtraction, multiplication, or division).

Basic Arithmetic Circuits

Half Adder

a combinational circuit, which performs the addition of two binary numbers A and B are of single bit. It produces two outputs sum, S & carry, C. (diagram 1.)

Full Adder

a combinational circuit, which performs the **addition of three bits** A, B and C_{in}. Where, A & B are the two parallel significant bits and C_{in} is the carry bit. (diagram 2.)

4-bit Binary Adder

performs the **addition of two 4-bit numbers.** We can implement 4-bit binary adder in one of the two following ways.

- Use one Half adder for doing the addition of two Least significant bits and three Full adders for doing the addition of three higher significant bits.
- Use four Full adders for uniformity. Since, initial carry C_{in} is zero, the Full adder which is used for adding the least significant bits becomes Half adder.(diagram 3.)

Reference

[1] https://www.digitalelectronicsdeeds.com/
[2] Manual Pengguna, (2022). Aplikasi Pendidikan dan Reka Bentuk Elektronik Digital (S. Widyarto, Ed. & Trans.; 1st ed.). International Community Forum (ICF).

ICF INTERNATIONAL COMMUNITY FORUM (ICF)

Deeds-DcS Digital Circuit Simulator

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