Assignment-3 (CS 232) by Utkarsh Ranjan

4-bit Ripple Carry Adder

Components

4 1-bit Full Adder

Gate Level Description

1-bit Full Adder ≡ 2 x 1-bit Half Adder + Or Gate
≡ 2 x XOR gate + 2 x And gate + Or Gate

4-bit Ripple Carry Adder ≡ 8 x XOR gate + 8 x And gate + 4 x Or Gate

Description

- 3 Inputs: two 4-bit Strings (A , B) , one bit (Cin)
- 2 Outputs: one 4-bit String (Sum), one bit (Cout)

Idea

- Ripple Carry Adder works in different stages. Idea being similar to addition in mathematics.
- Each full adder takes the carry-in , 1-bit of each A ,B as input and produces carry-out and sum bit as output.
- The carry-out produced by a full adder serves as carry-in for its adjacent most significant full adder.
- The carry-out of the 4th Full adder is the Cout of the 4-bit Ripple Carry Adder.