

RIPPLE CARRY ADDER

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CONTENT

INTRODUCTION

- What is an adder ?
- Full Adder



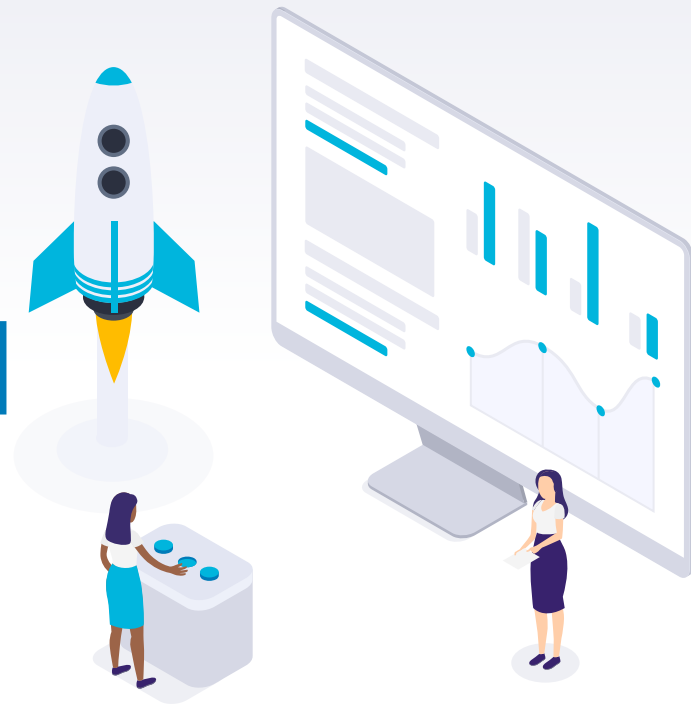
RIPPLE CARRY ADDER

- Definition
- Circuit Diagram
- Logic Diagram
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INTRODUCTION

Let's start with the BASICS



▶ WHAT IS AN ADDER ?

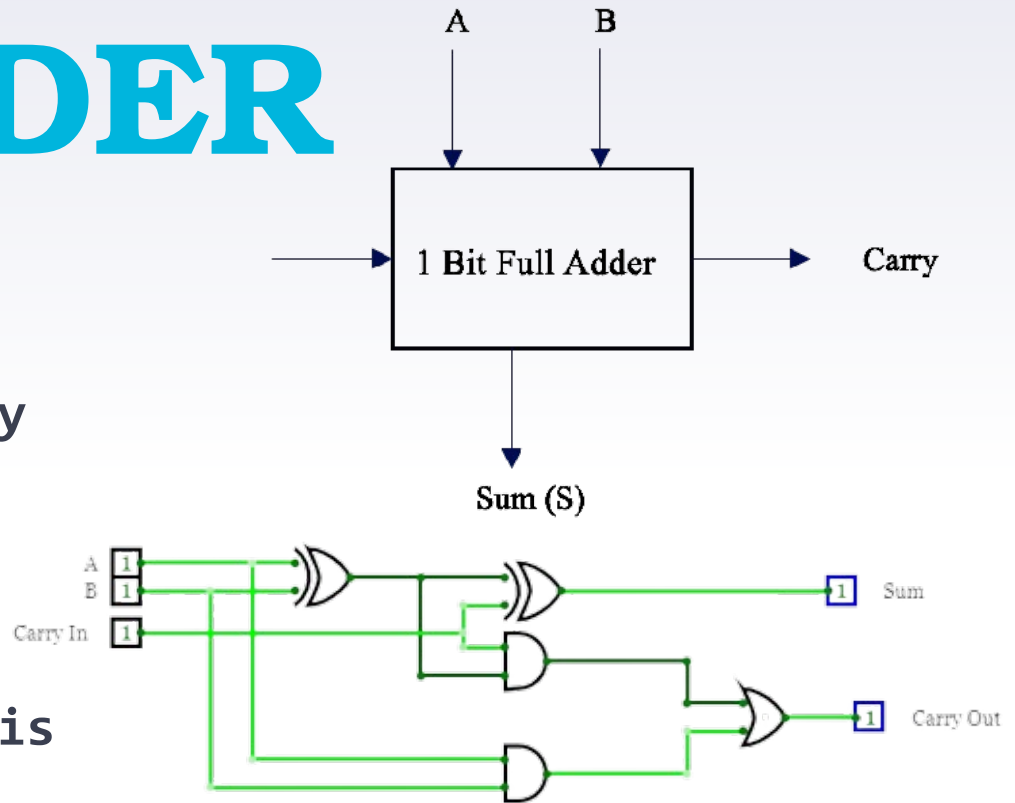
- ▶ An adder is a digital circuit that performs addition of numbers
- ▶ They are operated on binary numbers
- ▶ In processor it is used to calculate addresses, table operations



FULL ADDER

Used to add two input operand bits plus a carry in bit and outputs a carry out bit and sum bit

The sum is the XOR of the input bits and the carry is the AND of the input bits



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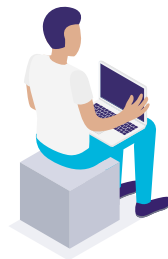
RIPPLE CARRY ADDER

Definitions and representations

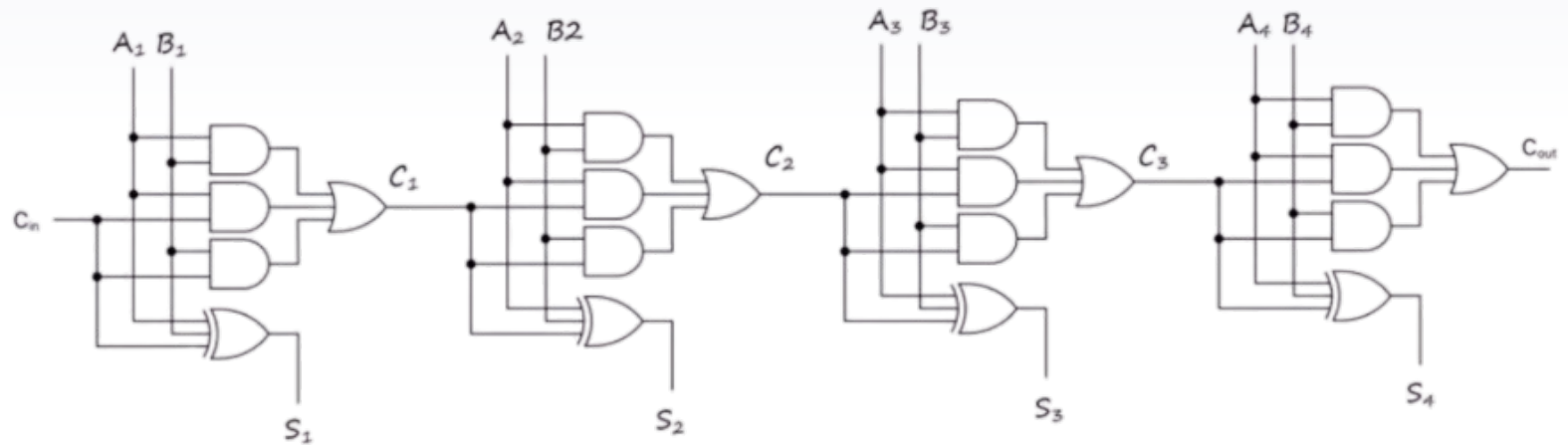


DEFINITION

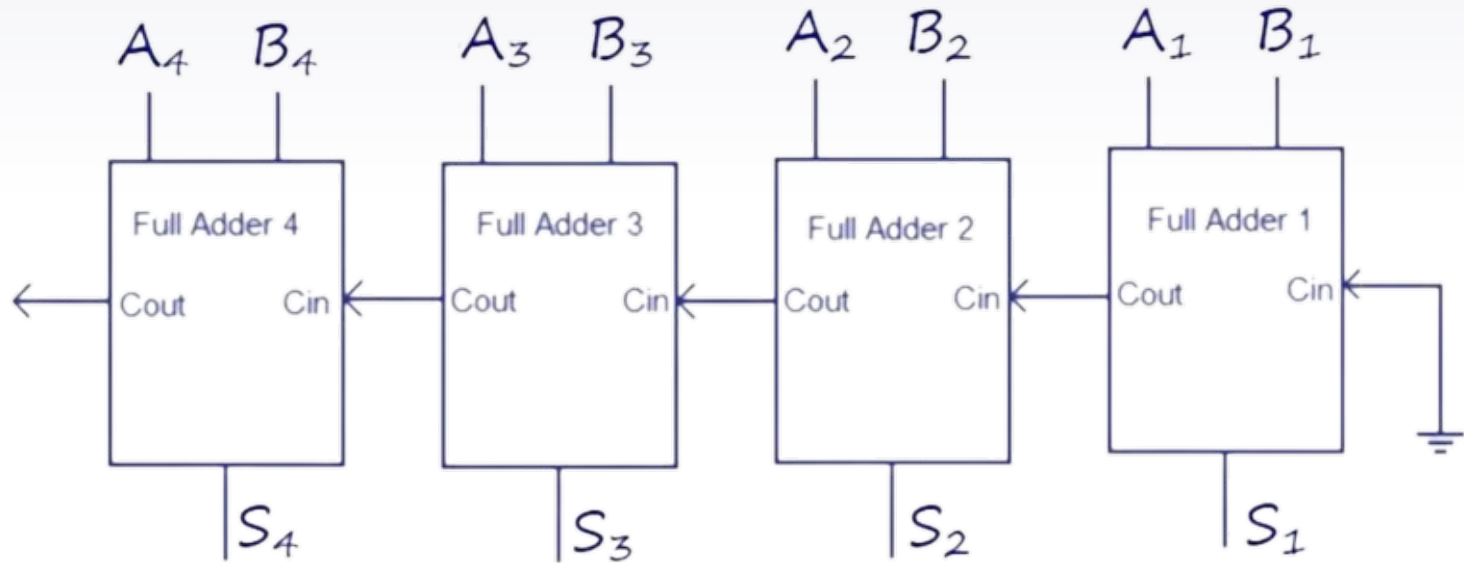
- ▶ It is constructed by cascading full block adders in series
- ▶ Each carry bit gets rippled into the next stage
- ▶ For two n -bit inputs we need n full adders



CIRCUIT DIAGRAM



LOGIC DIAGRAM



▶ TRUTH TABLE

A ₁	A ₂	A ₃	A ₄	B ₄	B ₃	B ₂	B ₁	S ₄	S ₃	S ₂	S ₁	Carry
0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	1	0	0	1	0	0	0	0
1	0	0	0	1	0	0	0	0	0	0	0	1
1	0	1	0	1	0	1	0	0	1	0	0	1
1	1	0	0	1	1	0	0	1	0	0	0	1
1	1	1	0	1	1	1	0	1	1	0	0	1
1	1	1	1	1	1	1	1	1	1	1	0	1

