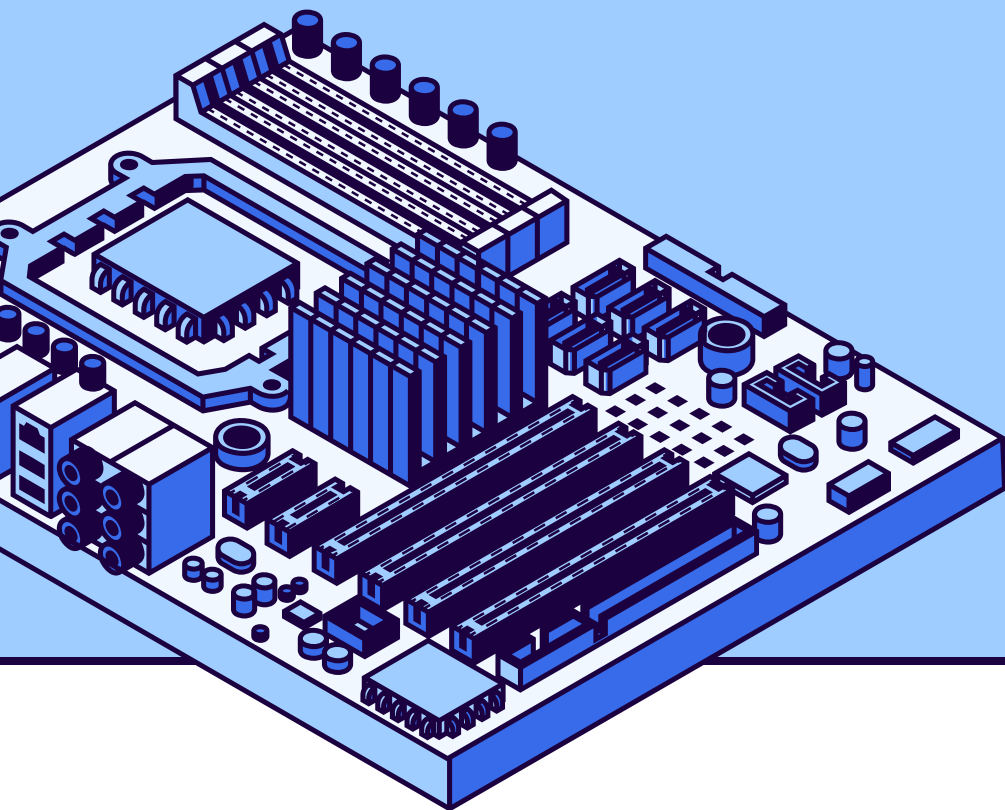
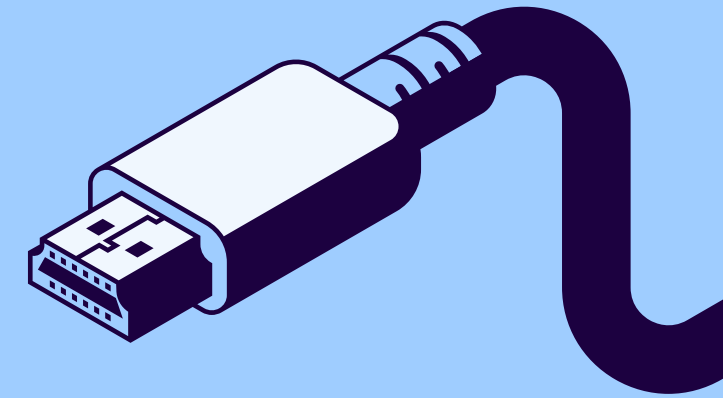

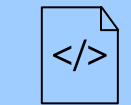



TITLE: 32-BIT KOGGE STONE ADDER

SUBTITLE: RTL DESIGN, SIMULATION & VERIFICATION



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 [HTTPS://GITHUB.COM/SHIKHA-TIWARI-HUB/32-BITKOGGESTONE-ADDER.GIT](https://github.com/shikha-tiwari-hub/32-bitkoggestone-adder.git)

 [https://www.linkedin.com/in/shikha-tiwari-520bb9322?](https://www.linkedin.com/in/shikha-tiwari-520bb9322?utm_source=share&utm_campaign=share_via&utm_content=profile&utm_medium=android_app)
[utm_source=share&utm_campaign=share_via&utm_content=profile&utm_medium=android_app](https://www.linkedin.com/in/shikha-tiwari-520bb9322?utm_source=share&utm_campaign=share_via&utm_content=profile&utm_medium=android_app)

SHIKHA | 04-07-2025

WHAT IS A KOGGE-STONE ADDER?

A KOGGE-STONE ADDER IS A DIGITAL CIRCUIT THAT ADDS TWO BINARY NUMBERS VERY QUICKLY.

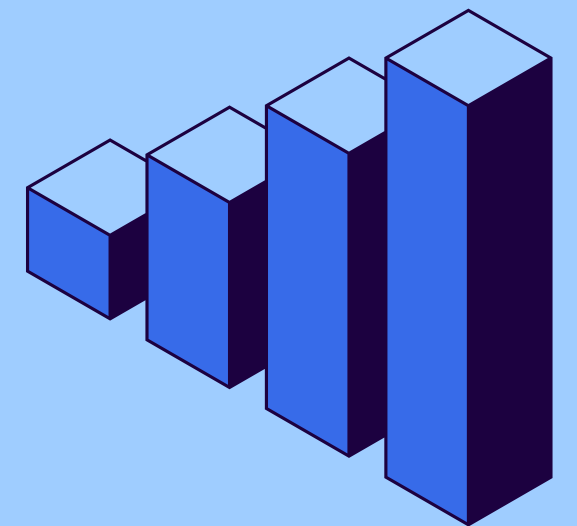
UNLIKE SIMPLER ADDERS, WHICH CALCULATE CARRIES STEP BY STEP (FROM RIGHT TO LEFT), THE KOGGE-STONE ADDER COMPUTES ALL THE CARRY BITS IN PARALLEL.

THIS MAKES IT MUCH FASTER, ESPECIALLY WHEN ADDING LARGE NUMBERS (LIKE 32 BITS OR 64 BITS).



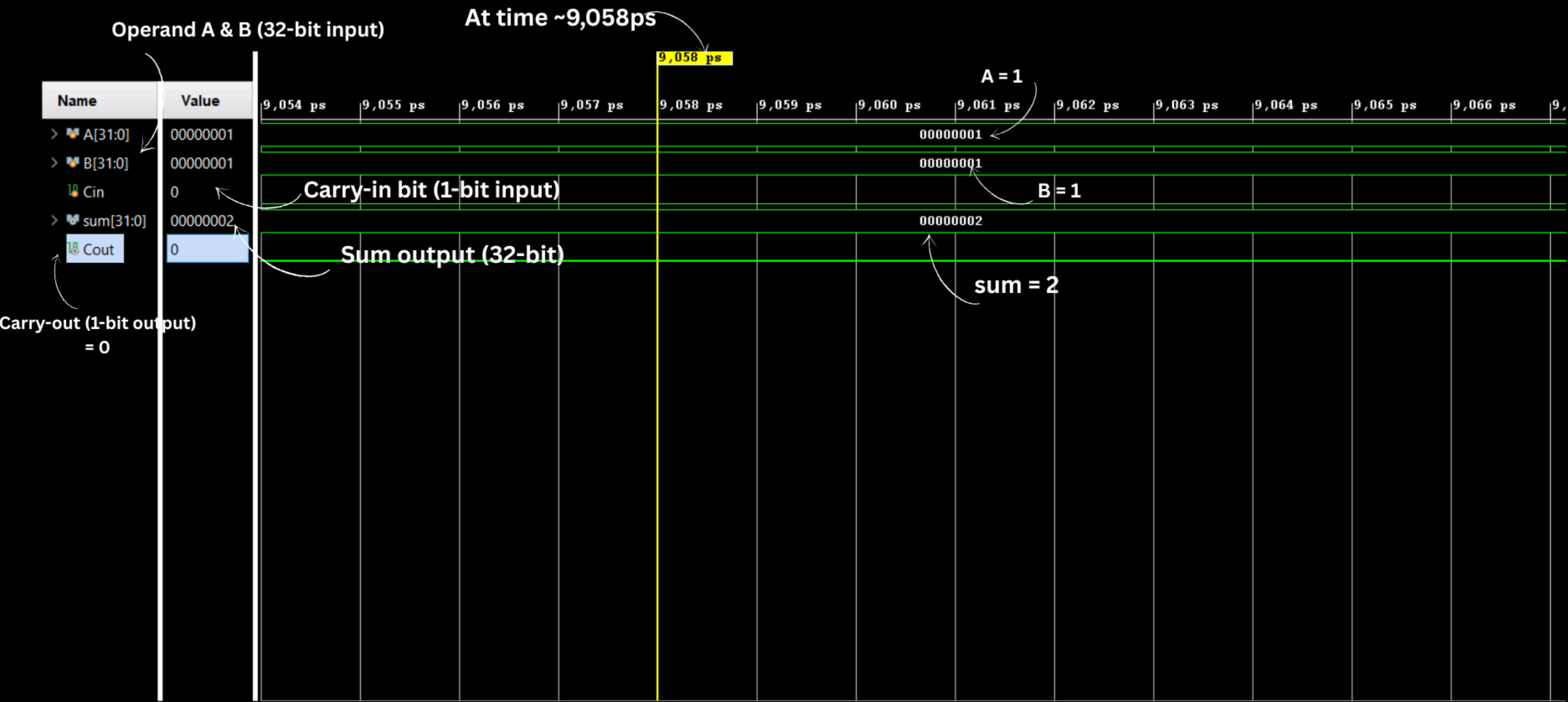
*Imagine people in a line passing a message one by one—
that's a ripple-carry adder.*

*Now imagine everyone gets the message at the same time—
that's how a Kogge-Stone Adder works.*

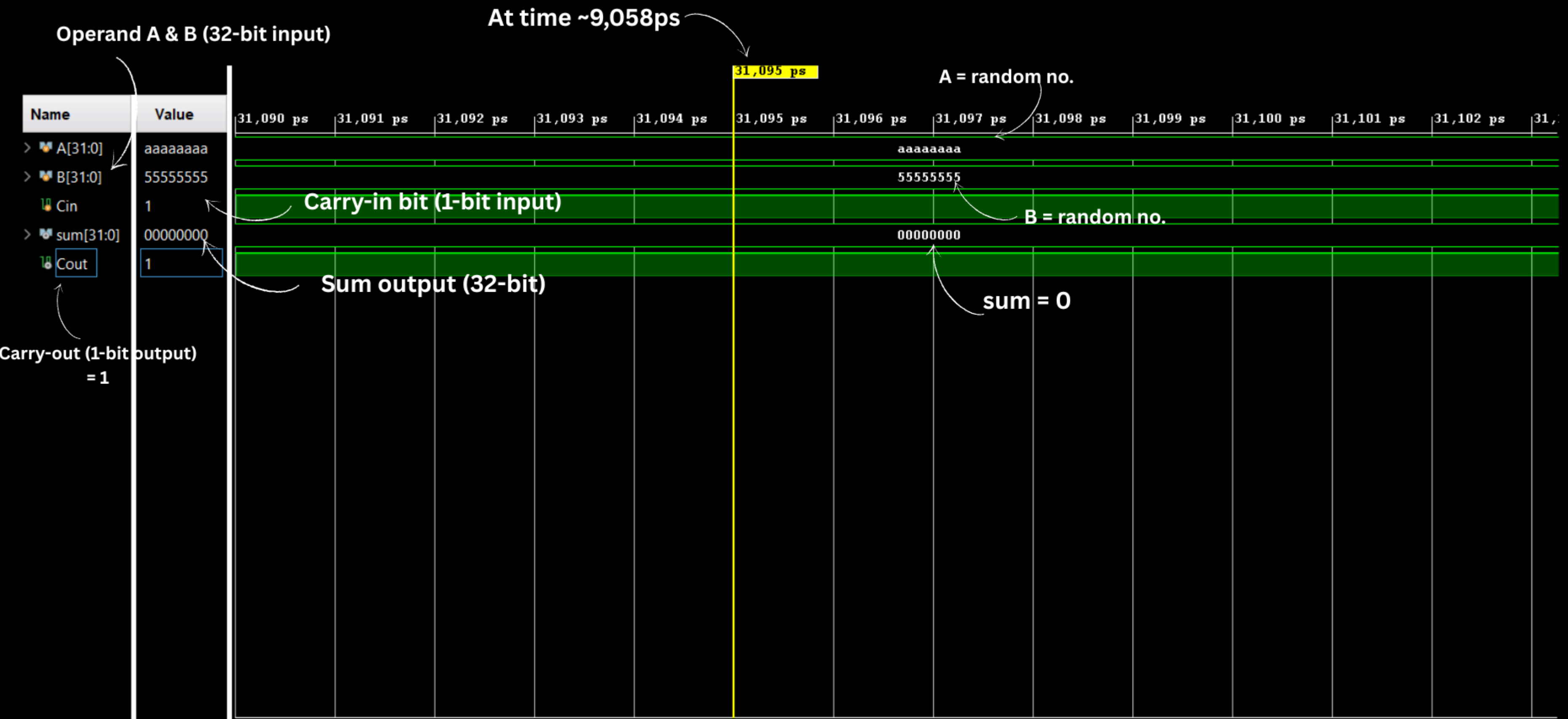


WAVEFORM

32-bit Kogge Stone Adder

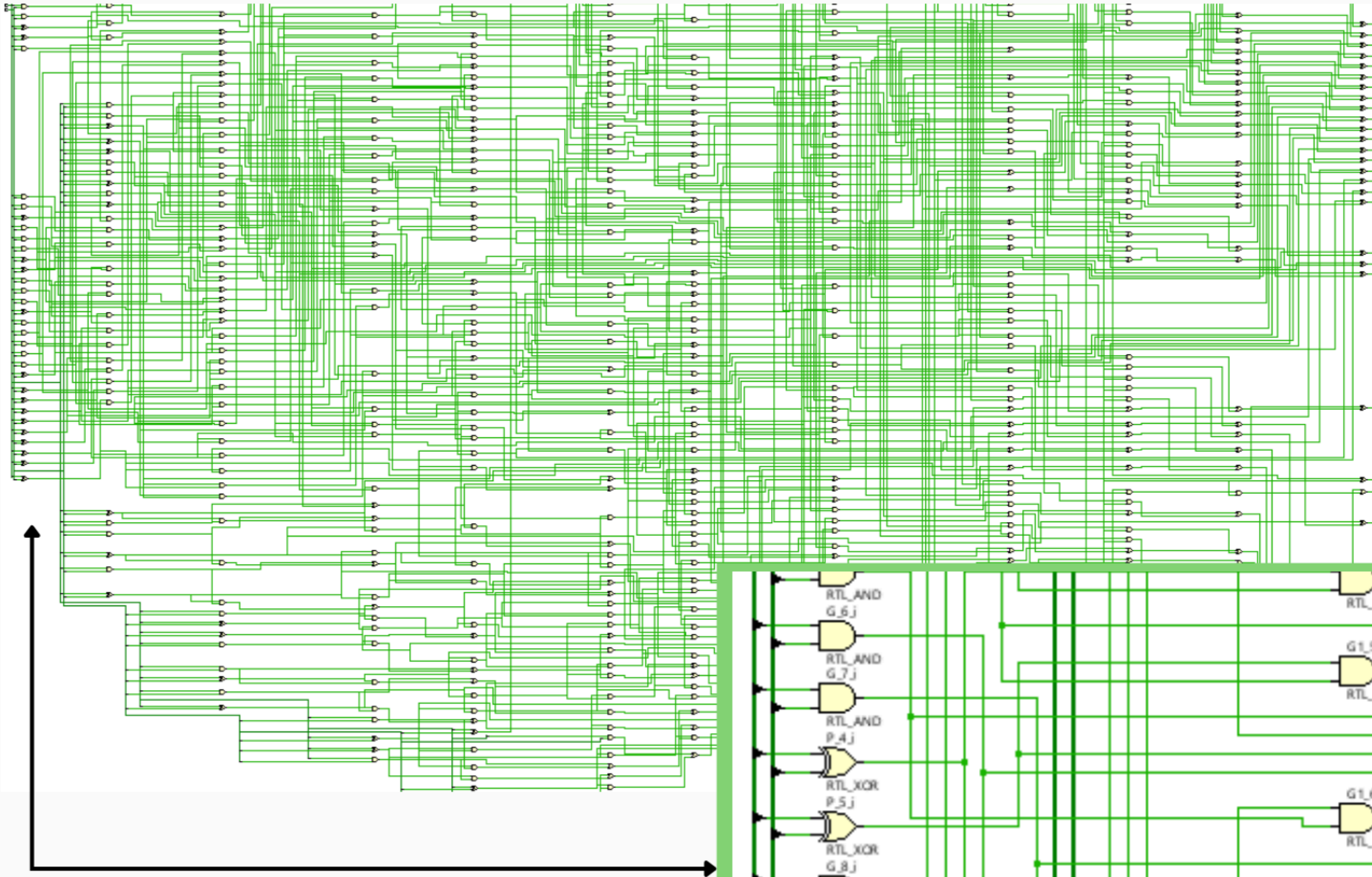


32-bit Kogge Stone Adder



SCHEMATIC DIAGRAM-Kogge Stone Adder

Schematic auto-generated from synthesized Verilog in Vivado.



This schematic shows how generate and propagate signals are combined in a parallel-prefix tree structure. Each green wire and cell contributes to computing the carries across all 32 bits in a logarithmic number of stages.

