

Array Multiplier (1A)

•
•

Copyright (c) 2013 – 2015 Young W. Lim.

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.2 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled "GNU Free Documentation License".

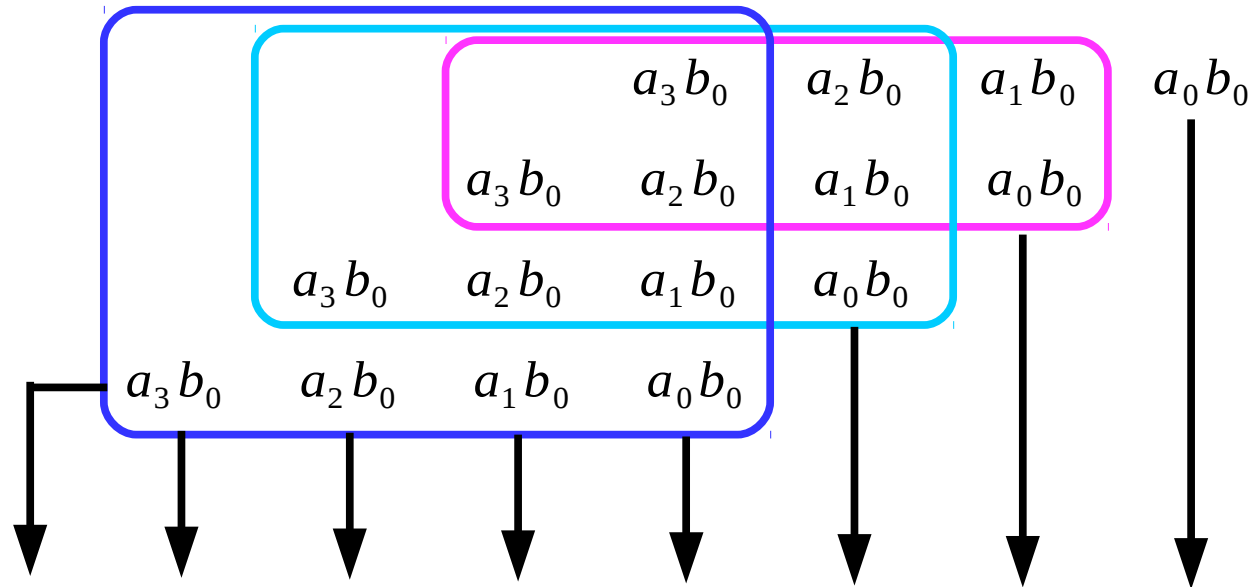
Please send corrections (or suggestions) to youngwlim@hotmail.com.

This document was produced by using OpenOffice and Octave.

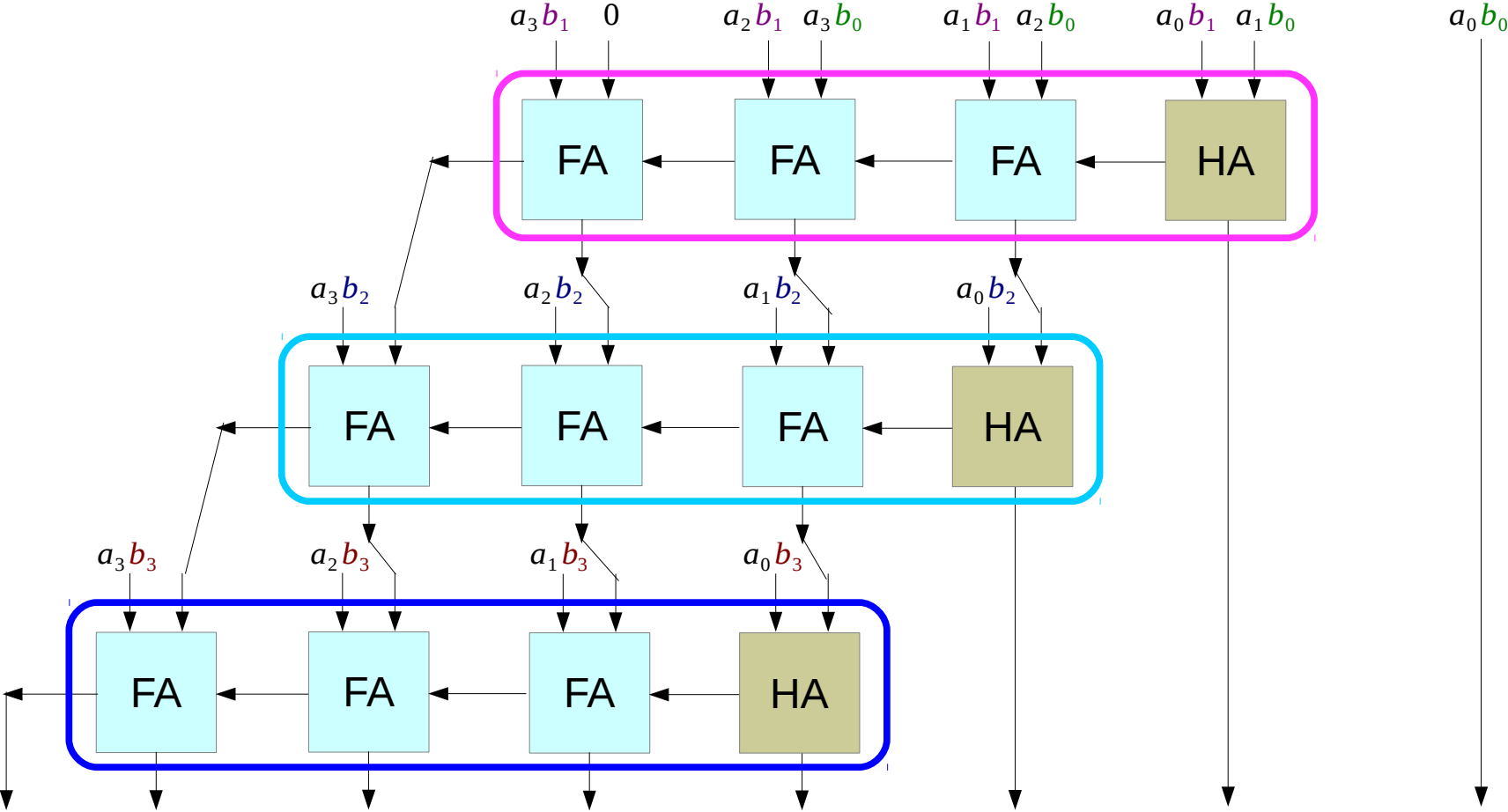
4-bit Multiplication

$$\begin{array}{rcccc} & & a_3 & a_2 & a_1 & a_0 \\ & & b_3 & b_2 & b_1 & b_0 \\ \hline & & a_3 b_0 & a_2 b_0 & a_1 b_0 & a_0 b_0 \\ & a_3 b_0 & a_2 b_0 & a_1 b_0 & a_0 b_0 & \\ & a_3 b_0 & a_2 b_0 & a_1 b_0 & a_0 b_0 & \\ a_3 b_0 & a_2 b_0 & a_1 b_0 & a_0 b_0 & & \\ \hline \end{array}$$

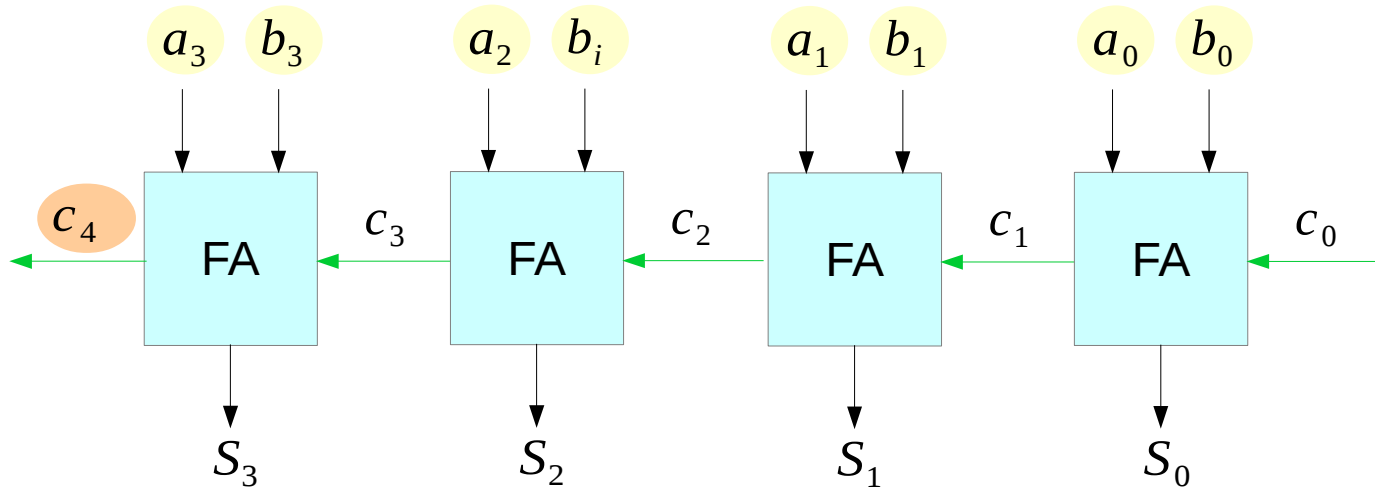
Summing Partial Products



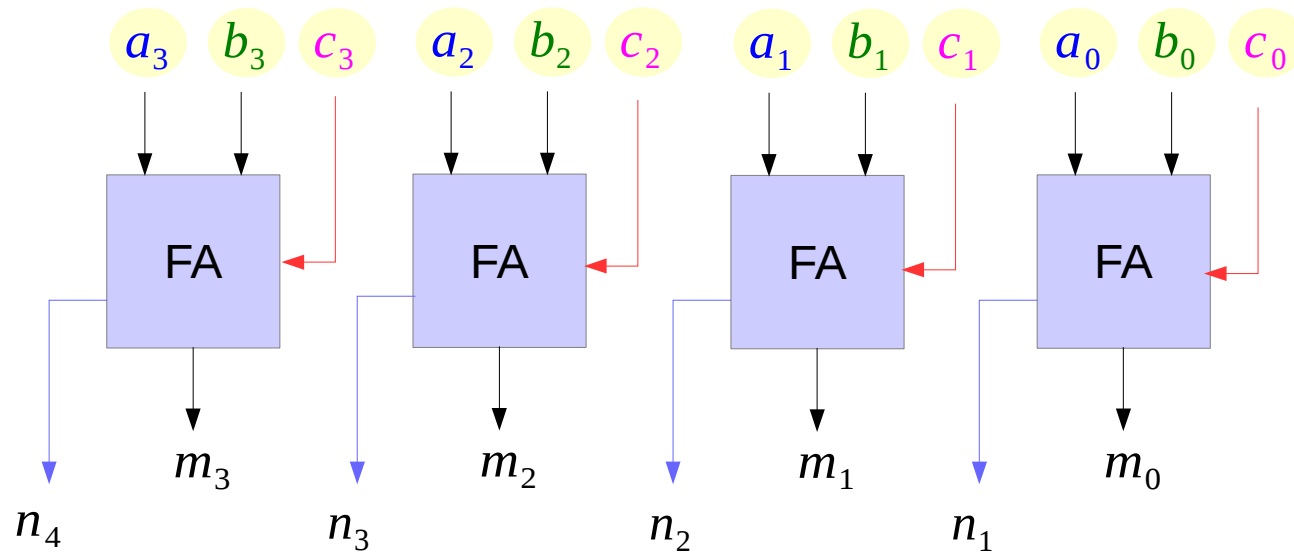
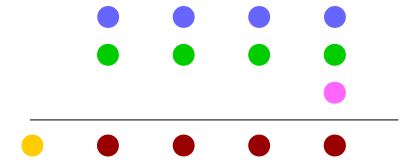
4-bit Array Multiplier



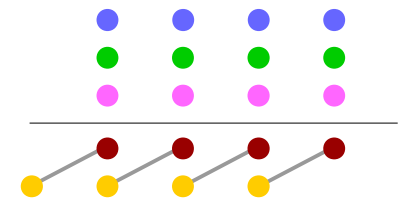
Multi-operand Adders



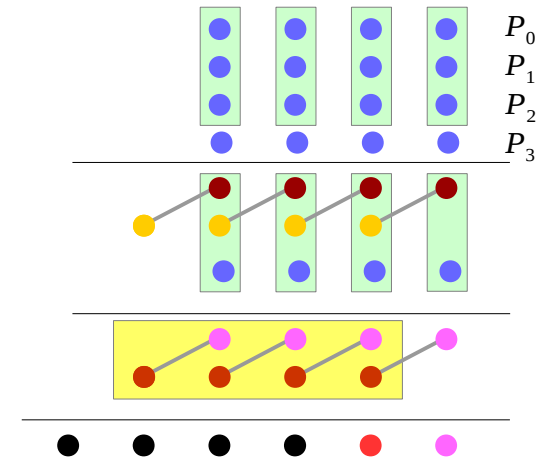
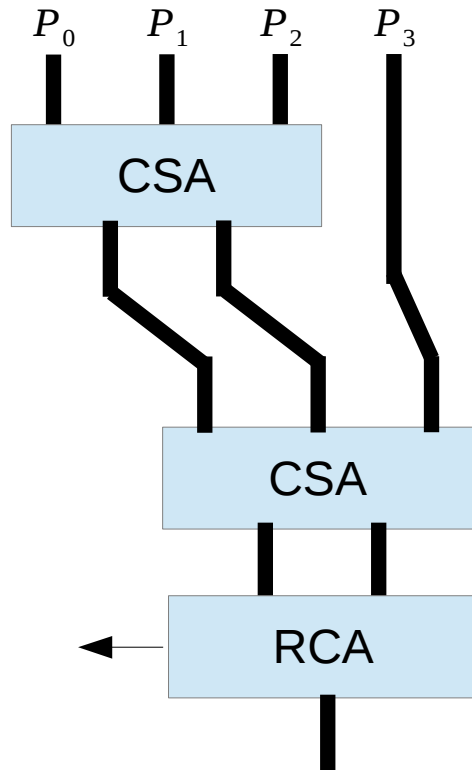
Ripple Carry Adder



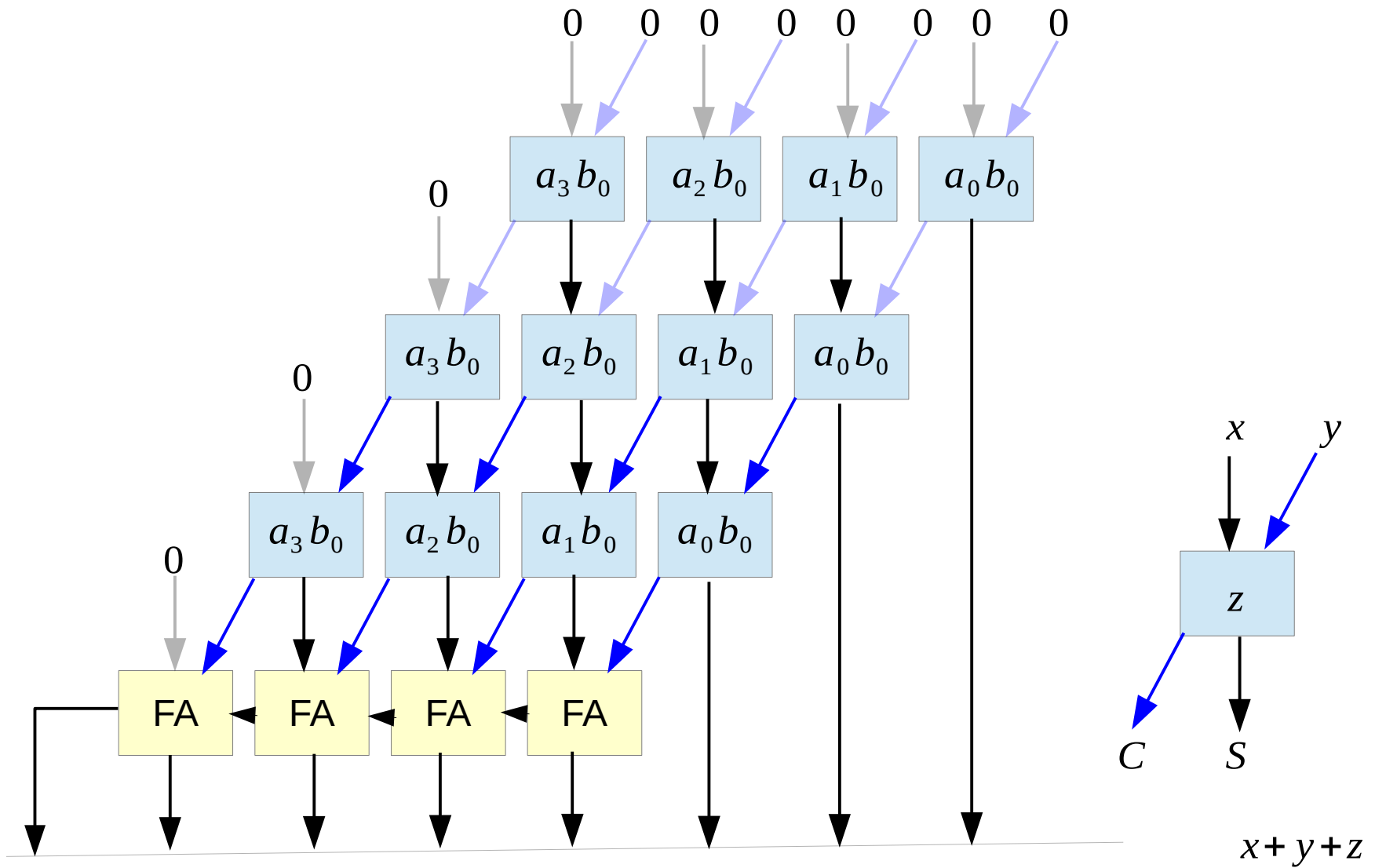
Carry Save Adder



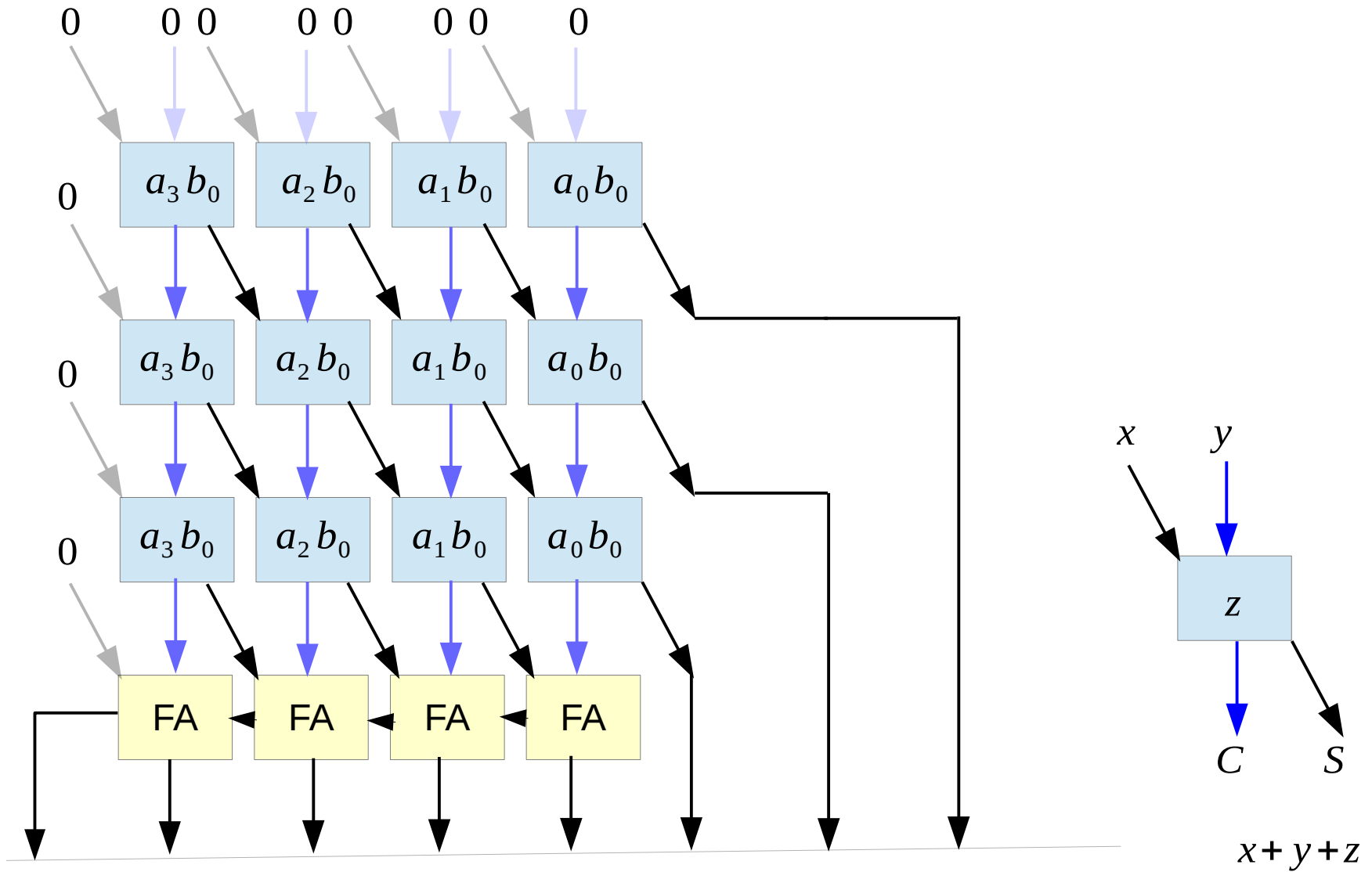
Adding four 4-bit numbers



Summing Partial Products - using CSA



4-bit Multiplier using CSA



References

- [1] en.wikipedia.org
- [2] Parhami, "Computer Arithmetic Algorithms and Hardware Designs"