Dadda Multiplier Example

James E. Stine
Electrical and Computer Engineering Department
Oklahoma State University
Stillwater, OK 74078, USA

1. Dadda Multiplier

This document is meant to show the in-class example of a 6-bit by 6-bit Dadda Multiplier. Here is a table documenting the area where the final iteration has an 10-bit CPA:

Iteration	Number of $(3,2)$ Counters	Number of $(2,2)$ Counters
1	3	3
2	5	1
3	7	1
Total	15	5

The methodology for creating Dadda trees, or so they are called, can be organized into the following steps listed below.

1. Reorganize matrix into inverted triangle (optional)
2. Figure out where the partial product matrix height falls within the Dadda sequence. Remember the series is found by multiplying a height by 3/2 and flooring it,

$$\begin{aligned} height_0 &= 2 \\ height_{i+1} &= \lfloor height_i \times 3/2 \rfloor \end{aligned}$$

3. Draw a dashed line between at the Dadda sequence you need to get to.
4. Starting at far right column, use $(2,2)$ and $(3,2)$ counters to reduce the stage until the Dadda sequence is met.
5. Repeat step (3) until the final height is 2.

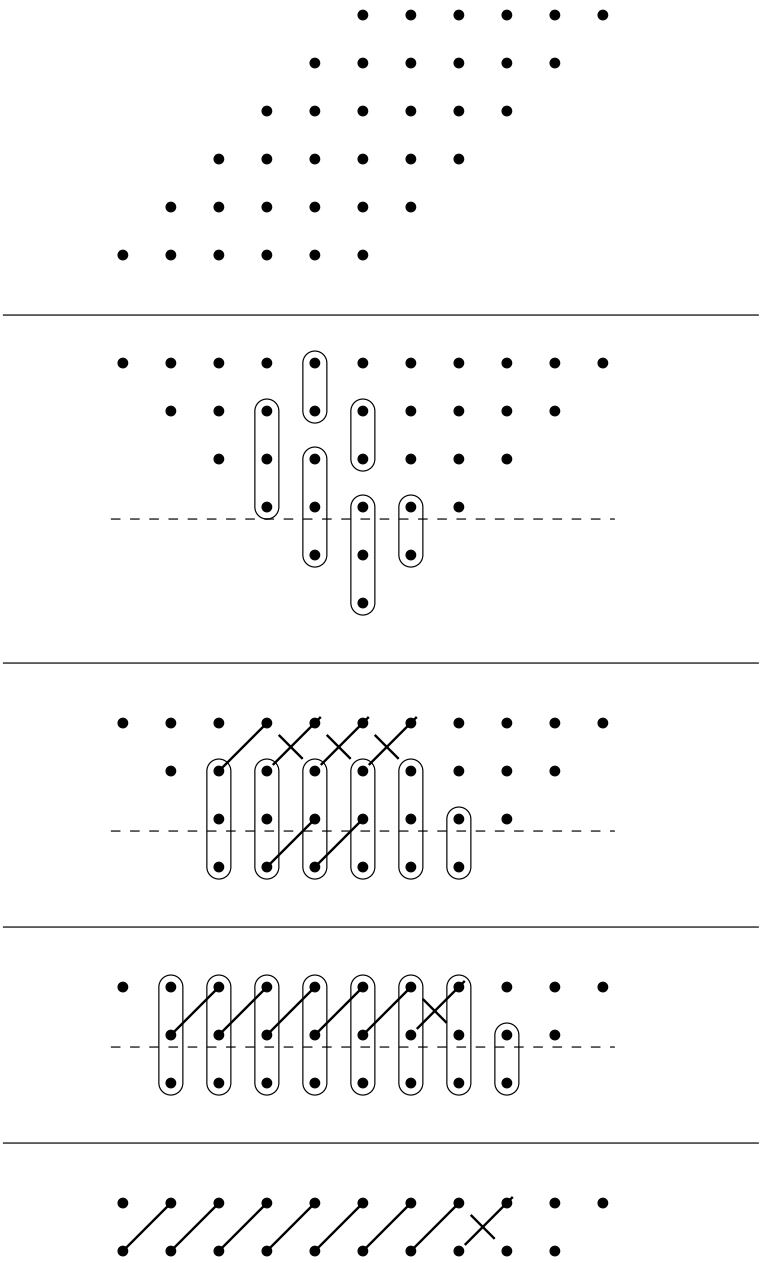

Figure 1: In-class Example of 6×6 Dadda Multiplier.