

Computer Arithmetic

Prof. Vojin G. Oklobdzija

Assignment No. 1.

Due: April 20, 2004

Homework Assignment No. 1:

1. Read Doran's paper. Identify four expansions for general propagate function that have desirable properties in terms of adder implementation. Evaluate them with respect to CMOS technology and rules of implementation. Do not allow more than four transistors in the n-path, and not more than two transistors in the p-path. Suggest alternative implementations to that of Ling's adder.
2. Read the paper by Nafziger. Examine his implementation of Ling's adder. Discuss it. Is it fully Ling and if not what scheme does it use ?
 - (a) How would you implement it as a fully Ling recursion. Discuss it and draw a block diagram with equations in each block.
 - (b) Draw a complete block diagram of the adder and explain the blocks and the algorithms used within blocks.
 - (c) Do you have any suggestions for a possible improvement ?

Extensions to this assignment:

1. If possible, define Ling recursion for higher level blocks and derive possible variations of Parallel-Prefix addition using Ling's recursion. Draw a block diagram of a few most efficient implementations and draw a schematic diagram of critical blocks.
(it may be possible to discover something better – let's give it a try)