

EE709 Assignment

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1 Analysis of a 4-bit adder

Consider a four bit adder without an incoming carry. It has 8 inputs

x3 x2 x1 x0
y3 y2 y1 y0

and produces five output bits

cout s3 s2 s1 s0

1. Consider the following subset A of the domain: those combinations of x and y such that an odd number of bits of x and an odd number of bits of y are 1. Using the BDD package, find the image of the set A in the range.
2. Consider the following subset B of the range: the set of all 5-bit numbers

c y3 y2 y1 y0

such that the number of bits in the number is odd. Using the BDD package, find the pre-image of the set B in the domain.

3. Lets prove a property about a four bit adder: show (using BDD's) that every even 4-bit number can be expressed as a sum of two prime numbers.