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-- Additionneur 4 bits avec report entrant et sortant

ENTITY adder IS
  PORT (
    x          : IN  BIT_VECTOR(3 DOWNTO 0);
    y          : IN  BIT_VECTOR(3 DOWNTO 0);
    q          : OUT BIT_VECTOR(3 DOWNTO 0);
    cin        : IN  BIT;
    cout       : OUT BIT;
    vdd        : IN  BIT;
    vss        : IN  BIT
  );
END adder;

ARCHITECTURE vbe OF adder IS

  SIGNAL carry : BIT_VECTOR(4 DOWNTO 0) ;

BEGIN

  carry(0) <= cin;
  carry(4 DOWNTO 1) <= ( ( x(3 DOWNTO 0)      AND y(3 DOWNTO 0) )      OR
                        ( x(3 DOWNTO 0)      AND carry(3 DOWNTO 0) ) OR
                        ( carry(3 DOWNTO 0) AND y(3 DOWNTO 0) )      ) ;
  q(3 DOWNTO 0)      <= x(3 DOWNTO 0) XOR
                        y (3 DOWNTO 0) XOR
                        carry(3 DOWNTO 0) ;
  cout      <= carry(4);

END;

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