

entity ALU_4bit is

Port (

A, B : in std_logic_vector(3 downto 0);

Sel : in std_logic_vector(1 downto 0);

Y : out std_logic_vector(3 downto 0)

);

end ALU_4bit;

architecture Behavioral of ALU_4bit is

constant DELAY : time := 10 ns;

begin

process(A, B, Sel)

variable result : std_logic_vector(3 downto 0);

begin

case Sel is

when "00" => -- Increment

Y <= std_logic_vector(unsigned(A) + 1) after DELAY;

when "01" => -- Subtract

Y <= std_logic_vector(unsigned(A) - unsigned(B)) after DELAY;

when "11" => -- Multiply

Y <= std_logic_vector(unsigned(A) * unsigned(B))(3 downto 0);

when others =>

null;

end case;

end process;

-- Concurrent NAND

Y <= A nand B when Sel = "10";

end Behavioral;