```
library IEEE;
  use ieee.std_logic_1164.ALL;
  use IEEE.STD_LOGIC_ARITH.ALL;
  use IEEE.STD_LOGIC_UNSIGNED.ALL;

entity tb_cla_top is
end entity tb_cla_top;

architecture behavioral of tb_cla_top is

  component CLA_top is
    port(
      a, b : in std_logic_vector(31 downto 0);
      cin  : in std_logic;
      s    : out std_logic_vector(31 downto 0);
      cout : out std_logic
    );
  end component;


  signal tb_a, tb_b : std_logic_vector(31 downto 0):= (others => '0');
  signal tb_cin : std_logic:= '0';

  signal tb_cout : std_logic;
  signal tb_s : std_logic_vector(31 downto 0);

begin

  DUT: CLA_top
  port map(
    a    => tb_a,
    b    => tb_b,
    cin  => tb_cin,
    s    => tb_s,
    cout => tb_cout
  );

  process
  begin
    wait for 10 ns;
    tb_a <= ("00000000000000000000000000000101");
    tb_b <= ("00000000000000000000000000001010");
    tb_cin <= '0';
    wait for 10 ns;
    assert(tb_s = "00000000000000000000000000001111") report ("Test 1 ikke riktig,
feil sum") severity failure;
    assert(tb_cout = '0') report ("Test 1 ikke riktig, feil carry") severity
failure;

    wait for 10 ns;
    tb_a <= ("10000000000000000000000000000000");
    tb_b <= ("10000000000000000000000000000000");
    tb_cin <= '0';
    wait for 10 ns;
    assert(tb_s = "00000000000000000000000000000000") report ("Test 2 ikke riktig,
feil sum") severity failure;
    assert(tb_cout = '1') report ("Test 2 ikke riktig, feil carry") severity
failure;
```

```
    wait for 10 ns;
    tb_a <= ("00000000000000010000000000000000");
    tb_b <= ("00000000000000100000000000000000");
    tb_cin <= '0';
    wait for 10 ns;
    assert(tb_s = "00000000000000110000000000000000") report ("Test 3 ikke riktig,
feil sum") severity failure;
    assert(tb_cout = '0') report ("Test 3 ikke riktig, feil carry") severity
failure;

    wait for 10 ns;
    tb_a <= ("10000000000000000000000000000001");
    tb_b <= ("10000000000000000000000000000001");
    tb_cin <= '0';
    wait for 10 ns;
    assert(tb_s = "00000000000000000000000000000010") report ("Test 4 ikke riktig,
feil sum") severity failure;
    assert(tb_cout = '1') report ("Test 4 ikke riktig, feil carry") severity
failure;

    wait for 10 ns;
    tb_a <= ("01010000000000000000000000000101");
    tb_b <= ("00101000000000000000000000001010");
    tb_cin <= '0';
    wait for 10 ns;
    assert(tb_s = "01111000000000000000000000001111") report ("Test 5 ikke riktig,
feil sum") severity failure;
    assert(tb_cout = '0') report ("Test 5 ikke riktig, feil carry") severity
failure;

    wait for 10 ns;
    tb_a <= ("11111111111111111111111111111111");
    tb_b <= ("00000000000000000000000000000000");
    tb_cin <= '0';
    wait for 10 ns;
    assert(tb_s = "11111111111111111111111111111111") report ("Test 6 ikke riktig,
feil sum") severity failure;
    assert(tb_cout = '0') report ("Test 6 ikke riktig, feil carry") severity
failure;

    wait for 10 ns;
    tb_a <= ("00000000000000000000000000000101");
    tb_b <= ("11111111111111111111111111111111");
    tb_cin <= '0';
    wait for 10 ns;
    assert(tb_s = "11111111111111111111111111111111") report ("Test 7 ikke riktig,
feil sum") severity failure;
    assert(tb_cout = '0') report ("Test 7 ikke riktig, feil carry") severity
failure;

    wait for 10 ns;
    tb_a <= ("01000000000000000000000000000000");
    tb_b <= ("01000000000000000000000000000000");
    tb_cin <= '0';
    wait for 10 ns;
    assert(tb_s = "10000000000000000000000000000000") report ("Test 8 ikke riktig,
feil sum") severity failure;
    assert(tb_cout = '0') report ("Test 8 ikke riktig, feil carry") severity
failure;
```

```
    wait for 10 ns;
    tb_a <= ("01000000000000000000000000000000");
    tb_b <= ("01000000000000000000000000000000");
    tb_cin <= '0';
    wait for 10 ns;
    assert(tb_s = "10000000000000000000000000000000") report ("Test 9 ikke riktig,
feil sum") severity failure;
    assert(tb_cout = '0') report ("Test 9 ikke riktig, feil carry") severity
failure;

    wait for 10 ns;
    tb_a <= ("01000000000000000000000000000001");
    tb_b <= ("00110000000000000000000000000001");
    tb_cin <= '0';
    wait for 10 ns;
    assert(tb_s = "01110000000000000000000000000010") report ("Test 10 ikke riktig,
feil sum") severity failure;
    assert(tb_cout = '0') report ("Test 10 ikke riktig, feil carry") severity
failure;
    wait for 10 ns;

    report("Ferdig!") severity note;
    std.env.stop;
  end process;
end architecture behavioral;
```