

Solution TD 02

```
library ieee;
use ieee.std_logic_1164.all;

entity decoder_bcd7seg is
    port (
        X : in std_logic_vector(3 downto 0); -- BCD (4 bits)
        Y : out std_logic_vector(6 downto 0) -- (a, b, c, d, e, f, g)
    );
end entity decoder_bcd7seg;

architecture arch of decoder_bcd7seg is
begin
    with X select
        Y <= "1000000" when "0000",
              "1111001" when "0001",
              "0100100" when "0010",
              "0110000" when "0011",
              "0011001" when "0100",
              "0010010" when "0101",
              "0000010" when "0110",
              "1111000" when "0111",
              "0000000" when "1000",
              "0010000" when "1001",
              "1111111" when others;
end arch;
```

```
library ieee;
use ieee.std_logic_1164.all;

entity compareteur_8bits is
    port (
        A : in std_logic_vector(7 downto 0);
        B : in std_logic_vector(7 downto 0);
        EQUA : out std_logic;
        SUPE : out std_logic;
        INFE : out std_logic
    );
end entity compareteur_8bits;

architecture arch of compareteur_8bits is
begin
    EQUA <= '1' when A = B else '0';
    SUPE <= '1' when A > B else '0';
    INFE <= '1' when A < B else '0';
end arch;
```

```

library ieee;
use ieee.std_logic_1164.all;

entity detecteur_parite is
    port (
        DIN : in std_logic_vector(3 downto 0);
        ODP : out std_logic;
        EVP : out std_logic
    );
end entity detecteur_parite;

architecture arch of detecteur_parite is

begin

    with Din select
        ODP <= '1' when "1000",
               '1' when "0100",
               '1' when "0010",
               '1' when "0001",
               '1' when "1110",
               '1' when "1011",
               '1' when "1101",
               '1' when "0111",
               '0' when others;

    with Din select
        EVP <= '1' when "1100",
               '1' when "0110",
               '1' when "0011",
               '1' when "1001",
               '1' when "1010",
               '1' when "0101",
               '1' when "1111",
               '0' when others;

end arch;

```