```
1   library ieee;
2   use ieee.std_logic_1164.all;
3   use ieee.numeric_std.all;
4
5   ----------------------------------------------------------------------------
6   -- 7-segment display driver. It displays a 4-bit number on a 7-segment
7   -- This is created as an entity so that it can be reused many times easily
8   --
9
10  entity SevenSegment is port (
11
12     hex      :  in  std_logic_vector(3 downto 0);   -- The 4 bit data to be displayed
13
14     sevenseg :  out std_logic_vector(6 downto 0)    -- 7-bit outputs to a 7-segment
15  );
16  end SevenSegment;
17
18  architecture Behavioral of SevenSegment is
19
20  --
21  -- The following statements convert a 4-bit input, called dataIn to a pattern of 7 bits
22  -- The segment turns on when it is '1' otherwise '0'
23  --
24  begin
25     with hex select                          --GFEDCBA         3210      -- data in
26     sevenseg                  <= "0111111" when "0000",     -- [0]
27                                  "0000110" when "0001",     -- [1]
28                                  "1011011" when "0010",     -- [2]       +---- a -----+
29                                  "1001111" when "0011",     -- [3]       |            |
30                                  "1100110" when "0100",     -- [4]       |            |
31                                  "1101101" when "0101",     -- [5]       f            b
32                                  "1111101" when "0110",     -- [6]       |            |
33                                  "0000111" when "0111",     -- [7]       |            |
34                                  "1111111" when "1000",     -- [8]       +---- g -----+
35                                  "1101111" when "1001",     -- [9]       |            |
36                                  "1110111" when "1010",     -- [A]       |            |
37                                  "1111100" when "1011",     -- [b]       e            c
38                                  "1011000" when "1100",     -- [c]       |            |
39                                  "1011110" when "1101",     -- [d]       |            |
40                                  "1111001" when "1110",     -- [E]       +---- d -----+
41                                  "1110001" when "1111",     -- [F]
42                                  "0000000" when others;     -- [ ]
43  end architecture Behavioral;
44  ----------------------------------------------------------------------------
45
```