```vhdl
 1    -- NAME: Owen Bailey
 2    -- COURSE AND SECTION: CE 1901 031
 3    -- FILE: CONTROLLER.vhd
 4    -- DESCRIPTION: Implements a motion controller for the Digibot using muxes
 5
 6    -- include ieee standard logic signal library
 7    library ieee;
 8    use ieee.std_logic_1164.all;
 9
10    -- describe the functional block diagram symbol
11    entity CONTROLLER is
12        port(
13            CLR:  in std_logic_vector(2 downto 0);
14            RDIR: out std_logic;
15            REN:  out std_logic;
16            LEN:  out std_logic;
17            LDIR: out std_logic;
18            HEX5CTRL: out std_logic_vector(5 downto 0);
19            HEX4CTRL: out std_logic_vector(5 downto 0);
20            HEX3CTRL: out std_logic_vector(5 downto 0);
21            HEX2CTRL: out std_logic_vector(5 downto 0);
22            HEX1CTRL: out std_logic_vector(5 downto 0);
23            HEX0CTRL: out std_logic_vector(5 downto 0)
24        );
25    end entity CONTROLLER;
26
27    -- describe signals and vectors using multiplexer with-select syntax
28    architecture MULTIPLEXER of CONTROLLER is
29    begin
30
31        with CLR select
32        RDIR <=  '1' when B"001",  -- minterm 1
33                 '1' when B"011",  -- minterm 3
34                 '0' when others;  -- don't cares and logic-0
35
36        with CLR select
37        REN <=   '0' when B"000",  -- minterm 0 low
38                 '0' when B"010",  -- minterm 2 low
39                 '1' when others;  -- don't cares and logic-1
40
41        with CLR select
42        LEN <=   '0' when B"000",  -- minterm 0 low
43                 '0' when B"001",  -- minterm 1 low
44                 '1' when others;  -- don't cares and logic-1
45
46        with CLR select
47        LDIR <=  '1' when B"010",  -- minterm 2
48                 '1' when B"011",  -- minterm 3
49                 '0' when others;  -- don't cares and logic-0
50
51        HEX5CTRL <= 6X"3F"; -- display 5 is always blank
52
53        with CLR select
54        HEX4CTRL <= 6X"1B" when B"010", -- R
55                    6X"3F" when others; -- display 4 is only active for "RIGHT"
56
57        with CLR select
58        HEX3CTRL <= 6X"1C" when B"000", -- S
59                    6X"15" when B"001", -- L
60                    6X"12" when B"010", -- I
61                    6X"3F" when B"011", -- blank
62                    6X"0B" when others; -- B
63
64        with CLR select
65        HEX2CTRL <= 6X"1D" when B"000", -- T
66                    6X"0E" when B"001", -- E
67                    6X"10" when B"010", -- G
68                    6X"3F" when B"011", -- blank
69                    6X"0A" when others; -- A
70
71        with CLR select
72        HEX1CTRL <= 6X"18" when B"000", -- O
73                    6X"0F" when B"001", -- F
74                    6X"11" when B"010", -- H
75                    6X"10" when B"011", -- G
76                    6X"0C" when others; -- C
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```vhdl
77
78          with CLR select
79          HEX0CTRL <= 6X"19" when B"000", -- P
80                      6X"1D" when B"001", -- T
81                      6X"1D" when B"010", -- T
82                      6X"18" when B"011", -- O
83                      6X"14" when others; -- K
84
85    end architecture MULTIPLEXER;
```