

Q1. Do question 4.1 (chapter 4).

```
1  -- Homework 8 Question 4p1
2  -- Design of Digital Circuits
3  -- Mark Musil
4
5  -- Translate the following code into an if-then-else
   statement:
6
7  transmit <= signal_a when state = idle else
8      signal_b when state = incoming else
9      signal_c when state = outgoing else
10     signal_d;
11
12  -- Answer
13
14  if state = idle then
15      transmit <= signal_a;
16  elseif state = incoming then
17      transmit <= signal_b;
18  elseif state = outgoing then
19      transmit <= signal_c;
20  else
21      transmit <= signal_d;
22  end if;
```

Q2. Do question 4.2 (chapter 4).

```
eight_bit_even_parity_checker.vhd x MyPLL.vhd x MyPLL_inst.vhd x q14p1.vhd x BlinkerTest.txt x q24p2.vhd x
1  -- Question 4p2
2  -- Mark Musil
3
4  -- Translate the following code to a when-else st
5
6  process (a, b, j, k)
7      begin
8          if a = "1" and b = "0" then
9              step <= "0100";
10         elsif a = "1" then
11             step <= j;
12         elsif b = "1" then
13             step <= k;
14         else
15             step <= "----";
16         end if;
17     end process;
18
19     -- To a when-else statement
20
21
22     process (a, b, j, k)
23     begin
24         step <= "0100" when (a = "1" and b = "0") else
25             j         when a = "1" else
26             k         when b = "1" else
27             "----"    when others;
28     end process;
```

Q3. Do question 4.3 (chapter 4).

```
eight_bit_even_parity_checker.vhd x MyPLL.vhd x MyPLL_inst.vhd x q14p1.vhd x BlinkerTest.txt x q24p2.vhd x new 1 x
1  -- Mark Musil
2  -- Homework 8 problem 3
3
4
5  -- Translate the following code to a case-when statement
6
7  with state select
8      data <= "0000" when idle | terminate,
9              "1111" when increase,
10             "1010" when maintain,
11             "0101" when decrease,
12             "----" when others;
13
14
15  -- Answer
16
17  case state is
18      when idle | terminate => data <= "0000";
19      when increase => data <= "1111";
20      when decrease => data <= "1010";
21      when others => data <= "----";
22  end case;
```

Q4. Do question 4.5 (chapter 4).

```
sq_wave_fourier_fn_Musil.txt | gate_level_example.txt | my_gate_level_example.vhd | test_bench_for_decrementer.vhd | new 1 x
1  -- Mark Musil
2  -- Homework 8 question 4
3
4  -- Translate the following code to two with-select-when
   statements
5
6
7  case state is
8      when idle => a <= "11"; b <= "00";
9      when terminate | increase => a <= "01"; b <= "--";
10     when maintain | decrease => a <= "10"; b <= "11";
11     when others => a <= "11"; b <= "01";
12 end case;
13
14
15 -- Answer
16
17
18 with state select
19     a <= "11" when idle,
20     "01" when terminate | increase,
21     "10" when maintain | decrease,
22     "11" when others;
23 end case;
24
25 with state select
26     b <= "00" when idle,
27     "--" when terminate | increase,
28     "11" when maintain | decrease,
29     "01" when others;
30 end case;
31
```