```
 1
 2  --------------Shifter (Adjusts the binary point according to the Exponents)--------------
 3
 4  library IEEE;
 5  use IEEE.STD_LOGIC_1164.ALL;
 6  use IEEE.NUMERIC_STD.ALL;
 7
 8  entity SHIFTER is
 9      --generic (N : natural := 5); --This is the input size of Mantissa,Including implied bit
10      Port ( Min : in  UNSIGNED (4 downto 0):= "00000"; --1.M means total 1+4 bits (1 of implied bit,and 4 of mantissa)
11             Shift : in  UNSIGNED(2 downto 0) := "000"; -- since exponent are of 3bits, their differenec is also 3 bits
12             Mout : out  UNSIGNED (9 downto 0) := "0000000000"); --Max shift possible is 5, so we have included them
13  end SHIFTER;
14
15  architecture Behavioral of SHIFTER is
16
17  begin
18  process(Shift,Min)
19     variable ShiftInt : INTEGER range 0 to 5;
20     variable Min_new : UNSIGNED (9 downto 0) := "0000000000"; --Max shift possible is 5, so we have included them
21     variable Shifted : UNSIGNED (9 downto 0) := "0000000000";
22     begin
23        case Shift is -- Select appropriate number of shift in integer
24           when "000" => ShiftInt := 0;
25           when "001" => ShiftInt := 1;
26           when "010" => ShiftInt := 2;
27           when "011" => ShiftInt := 3;
28           when "100" => ShiftInt := 4;
29           when "101" => ShiftInt := 5;
30           when others => null;
31        end case;
32           for i in 9 downto 5 loop --First make all Bits to zero
33              Min_new(i) := Min(i-5);
34           end loop;
35           --Min_new(9 downto 5) := Min(4 downto 0); -- For N=5, Min_new(9 downto 5) := Min(4 downto 0)
36                                                                    -- We equate first 5 bits of min to
   Shiftable Min_new
37           Shifted := Min_new srl ShiftInt; -- Shift right by required no. of shifts
38           Mout <= Shifted;
39     end process;
40  end Behavioral;
41
```