```
1
2   ----------------------Normalise and Round (Uses IEEE Rules of Normalisation and Chopping-----------------
3
4   library IEEE;
5   use IEEE.STD_LOGIC_1164.ALL;
6   use IEEE.NUMERIC_STD.ALL;
7
8   entity NormaliseAndRound is
9       Port ( M : in  UNSIGNED (9 downto 0);
10             X : in  INTEGER := 0;
11             ShiftDirection : in STD_LOGIC := '0';
12             Mr : buffer  UNSIGNED (3 downto 0));
13  end NormaliseAndRound;
14
15  architecture Behavioral of NormaliseAndRound is
16
17  begin
18  process(M,X,ShiftDirection)
19     variable TempM : UNSIGNED (9 downto 0) := "0000000000";
20     variable TempMM : UNSIGNED (3 downto 0);
21     begin
22        TempM := M;
23        if ShiftDirection = '1' then -- Shift right
24           TempM := M srl 1;
25           TempMM := TempM(9 downto 6);
26        else
27           TempM := M sll X; -- Normalisation Done
28           TempMM := TempM(8 downto 5); --Implied Bit Removed and Chopping also Done
29        end if;
30        Mr <= TempMM;
31     end process;
32  end Behavioral;
33
34
```