```
1
2   ------------------------Swapper (Identifies mantissa of smaller and larger number)-------------
3
4   library IEEE;
5   use IEEE.STD_LOGIC_1164.ALL;
6   use IEEE.NUMERIC_STD.ALL;
7
8   entity SWAP is
9       generic (N : natural := 4); --This is the input size of Mantissa,Excluding implied bit
10      Port ( Ma : in  UNSIGNED (N-1 downto 0); --As per decided convention
11             Mb : in  UNSIGNED (N-1 downto 0);
12             SwapIn : in STD_LOGIC;
13             Mout1 : out  UNSIGNED (N downto 0); --Output size increses as we attach the implied bit here itself
14             Mout2 : out  UNSIGNED (N downto 0));
15  end SWAP;
16
17  architecture Behavioral of SWAP is
18
19  begin
20     process(SwapIn)
21
22     variable Manew, Mbnew : UNSIGNED(N downto 0);
23     begin
24        Manew(N) := '1';
25        Mbnew(N) := '1'; -- Attach implied Bit at MSB
26        if SwapIn = '0' then
27           Manew(N-1 downto 0) := Ma; Mbnew(N-1 downto 0) := Mb;
28        else
29           Manew(N-1 downto 0) := Mb; Mbnew(N-1 downto 0) := Ma;
30        end if;
31        Mout1 <= Manew; Mout2 <= Mbnew;
32     end process;
33  end Behavioral;
34
35
```