Mealy Machine

.vhd File Code

```
library IEEE;
use IEEE.STD_LOGIC_1164.ALL;
entity mealymachine is
    Port ( led_p : out  STD_LOGIC_VECTOR (3 downto 0);
           led_n : out  STD_LOGIC_VECTOR (3 downto 0);
           x : in  STD_LOGIC;
           DIS: out STD_LOGIC_VECTOR (1 downto 0);
           SEG: out STD_LOGIC_VECTOR (6 downto 0);
           y : in  STD_LOGIC_VECTOR (1 downto 0));
end mealymachine;

architecture Behavioral of mealymachine is
begin
led_n (3 downto 2) <= "11";
led_p (3 downto 0) <= "0001";
DIS <= "01";
process (x,y)
begin
led_n (1) <=  not ((not y (0)) and x);
led_n (0) <= not ((y(0) or y(1)) and x);

if (y = "00") then
     if (x = '0') then
     SEG  <= "1000000";
     else
     SEG  <= "1000000";
     end if;
end if;
```

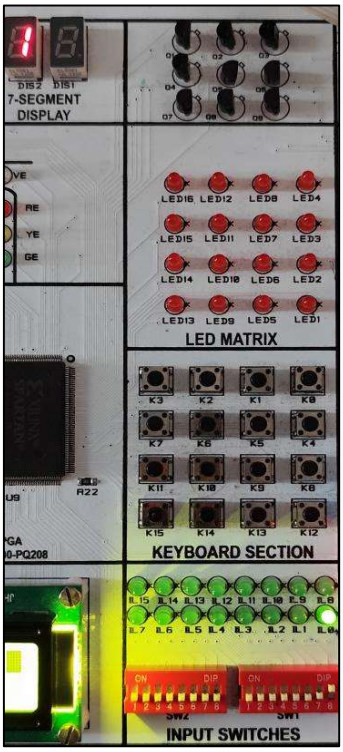
```
if (y = "01") then
      if (x = '0')then
      SEG  <= "1111001";
      else
      SEG  <= "1000000";
      end if;
end if;
if (y = "10") then
      if (x = '0')then
      SEG  <= "1111001";
      else
      SEG  <= "1000000";
      end if;
end if;
if (y = "11") then
      if (x = '0')then
      SEG  <= "1111001";
      else
      SEG  <= "1000000";
      end if;
end if;
      end process;
end Behavioral;
```

.ucf File Code

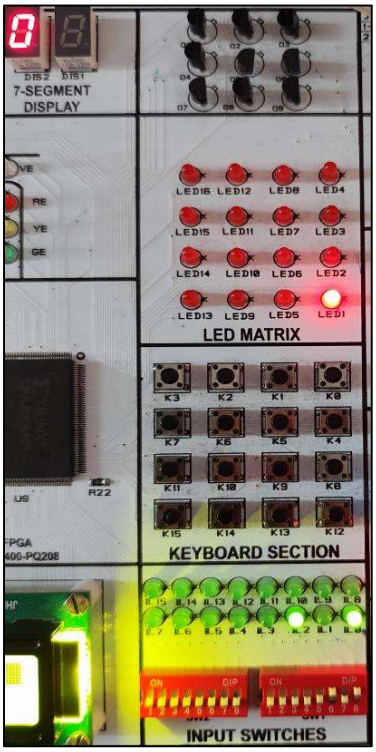
```
Net "led_n<0>" loc = "p132";
Net "led_n<1>" loc = "p131";
Net "led_n<2>" loc = "p130";
Net "led_n<3>" loc = "p128";
Net "led_p<0>" loc = "p126";
Net "led_p<1>" loc = "p133";
Net "led_p<2>" loc = "p135";
```

```
Net "led_p<3>" loc = "p137";
Net "A<0>" loc = "p87";
Net "A<1>" loc = "p86";
Net "A<2>" loc = "p85";
```

Kit Output:

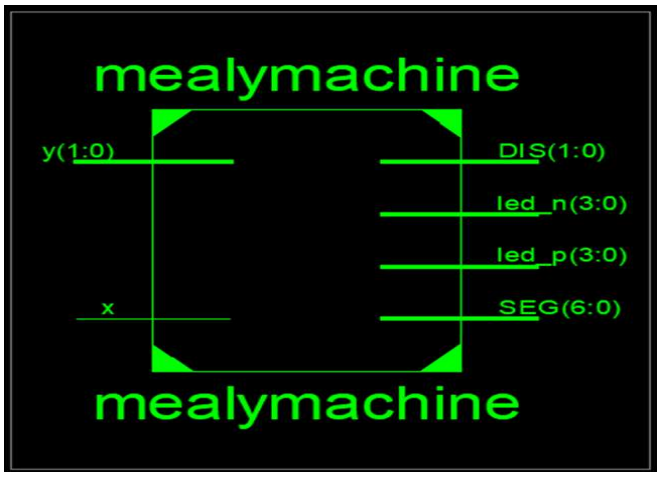


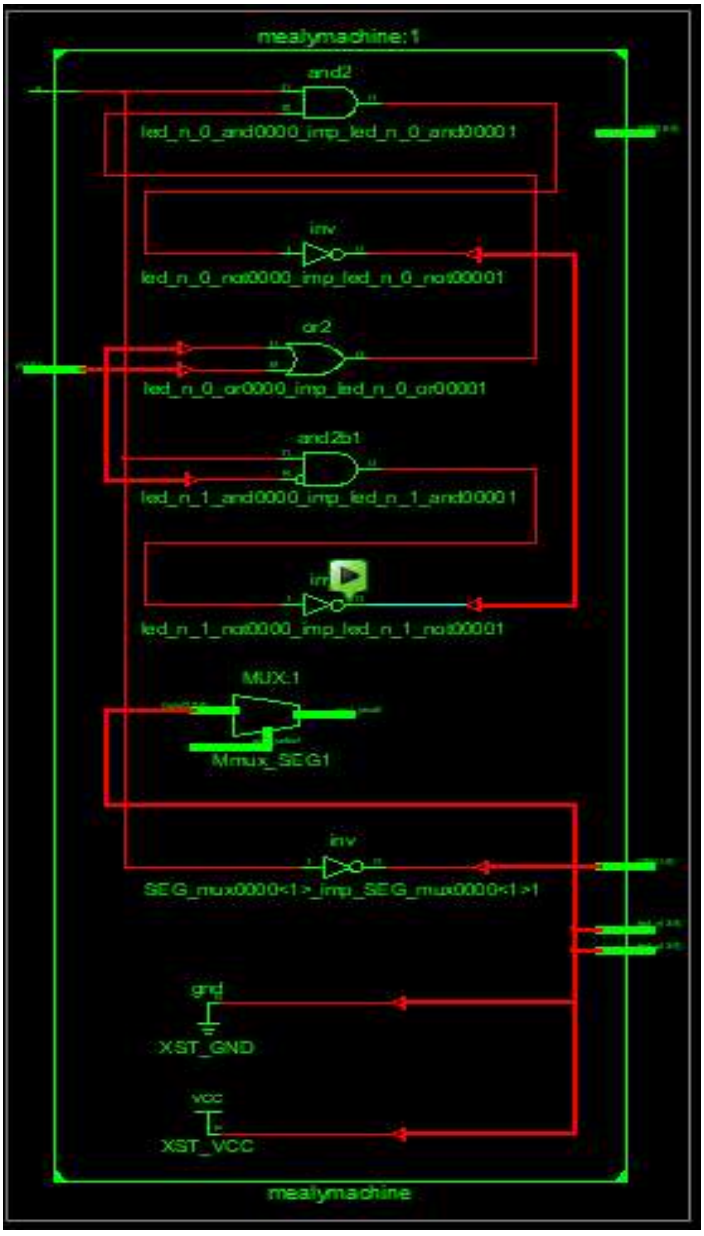
x=0; y1=0; y0=1
O/P – 1



x=1; y1=0; y0=1
O/P - 0

Simulation and RTL Schematic


mealymachine
y(1:0)
x
DIS(1:0)
led_n(3:0)
led_p(3:0)
SEG(6:0)
mealymachine


mealymachine:1
and2
led_n_0_and0000_imp_led_n_0_and00001
inv
led_n_0_not0000_imp_led_n_0_not00001
or2
led_n_0_or0000_imp_led_n_0_or00001
and2b1
led_n_1_and0000_imp_led_n_1_and00001
led_n_1_not0000_imp_led_n_1_not00001
MUX:1
Mmux_SEG1
inv
SEG_mux0000<1>_imp_SEG_mux0000<1>1
gnd
XST_GND
vcc
XST_VCC
mealymachine