Output

Keypad Controller

Program for KEYPAD :

```
entity keypad1 is
        port(clk:in std_logic;
                rl:in std_logic_vector(3 downto 0);
                sl:out std_logic_vector(3 downto 0);
                segen_o:out std_logic_vector(6 downto 0);
                display_en:out std_logic_vector(5 downto0));
end keypad1;
architecture Behavioral of keypad1 is
        signal sl_s:std_logic_vector(3 downto 0):=”1110”;
        signal segen:std_logic_vector(6 downto 0):=”1111111”;
begin
        process(clk, sl_s)
        begin
                if rising_edge(clk) then
                        sl_s(3)<=sl_s(2);
                        sl_s(2)<=sl_s(1);
                        sl_s(1)<=sl_s(0);
                        sl_s(0)<=sl_s(3);
                end if;
        end process;
        process(clk, rl, sl_s)
        begin
                if rising_edge(clk) then
                        case rl is
                        when “0111”=> if sl_s=”0111” then segen<=”0000001”;
                                        elsif sl_s=”1011” then segen<=”1001111”;
                                        elsif sl_s=”1101” then segen<=”0010010”;
                                        elsif sl_s=”1110” then segen<=”0000110”;
                                        end if;
                        when “1011”=> if sl_s=”0111” then segen<=”1001100”;
                                        elsif sl_s=”1011” then segen<=”0100100”;
                                        elsif sl_s=”1101” then segen<=”0100000”;
```

```
                                    elsif sl_s="1110" then segen<="0001111";
                                    end if;
                        when "1101"=> if sl_s="0111" then segen<="0000000";
                                    elsif sl_s="1011" then segen<="0001100";
                                    elsif sl_s="1101" then segen<="0001000";
                                    elsif sl_s="1110" then segen<="1100000";
                                    end if;
                        when "0111"=> if sl_s="0111" then segen<="0110001";
                                    elsif sl_s="1011" then segen<="1000010";
                                    elsif sl_s="1101" then segen<="0110000";
                                    elsif sl_s="1110" then segen<="0111000";
                                    end if;
                        when others=> segen<=segen;
                        end case;
                end if;
        end process;
        sl<=sl_s;
        display_en<="111101";
        segen_o<=segen;
end behavioral;
```

UCF For 4 by 4 Key pad :

```
NET "clk" LOC="p76";
NET "display_en<0>"  LOC= "p117";
NET "display_en <1>"  LOC= "p119";
NET "display_en <2>"  LOC= "p115";
NET "display_en <3>"  LOC= "p116";
NET "display_en <4>"  LOC= "p114";
NET "display_en <5>"  LOC= "p113";
NET "rl<3>"  LOC= "p189";
NET "rl <2>"  LOC= "p182";
NET "rl <1>"  LOC= "p183";
NET "rl <0>"  LOC= "p180";
NET "segen_O<6>"  LOC= "p120";
NET "segen_O <5>"  LOC= "p124";
NET "segen_O <4>"  LOC= "p123";
NET "segen_O <3>"  LOC= "p126";
```

NET “segen_O <2>” LOC= ”p125”;

NET “segen_O <1>” LOC= ”p130”;

NET “segen_O <0>” LOC= ”p128”;

NET “sl<3>” LOC= ”p178”;

NET “sl <2>” LOC= ”p184”;

NET “sl <1>” LOC= ”p185”;

NET “sl <0>” LOC= ”p187”;