The Islamic University of Gaza
Faculty of Engineering
Department of Computer Engineering
Embedded Systems Lab
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Lab#2

7-Segment and counters

By:
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7-Segment

We have two types of 7 segment:

1- Common Anode
2- Common Cathode

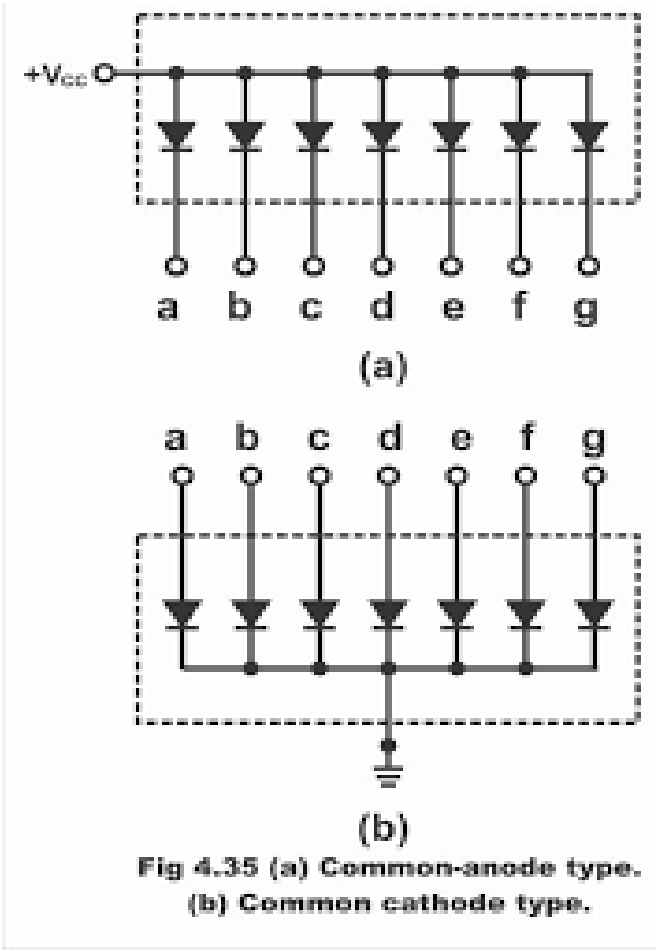
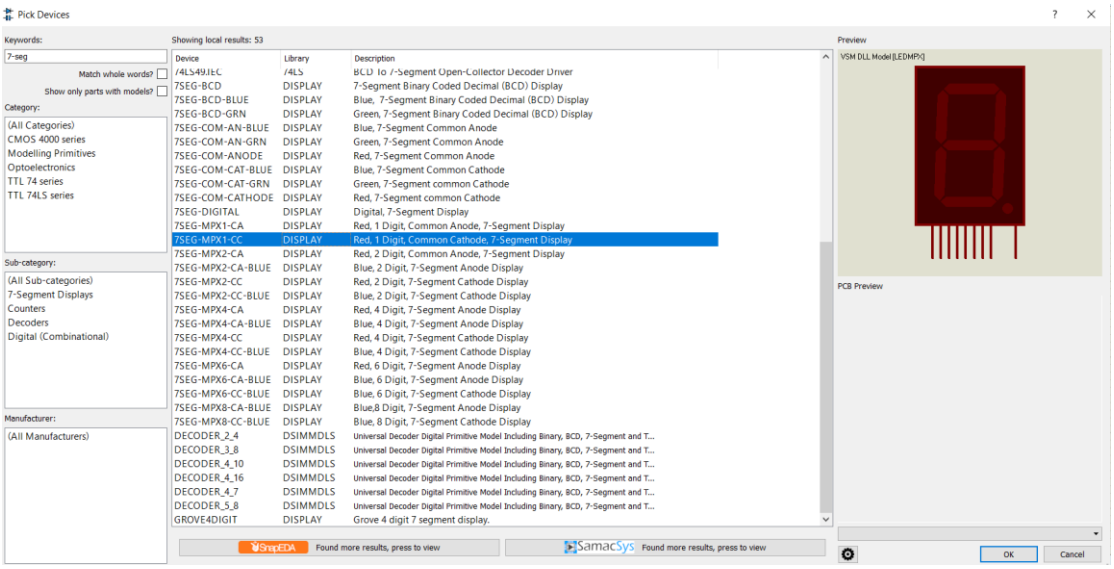
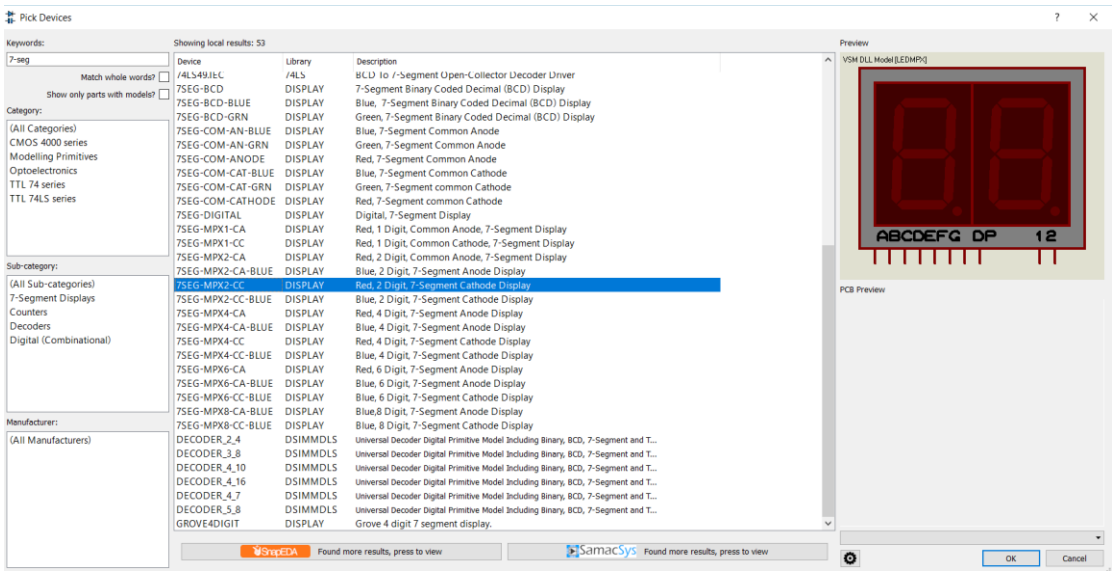


Fig 4.35 (a) Common-anode type.
(b) Common cathode type.

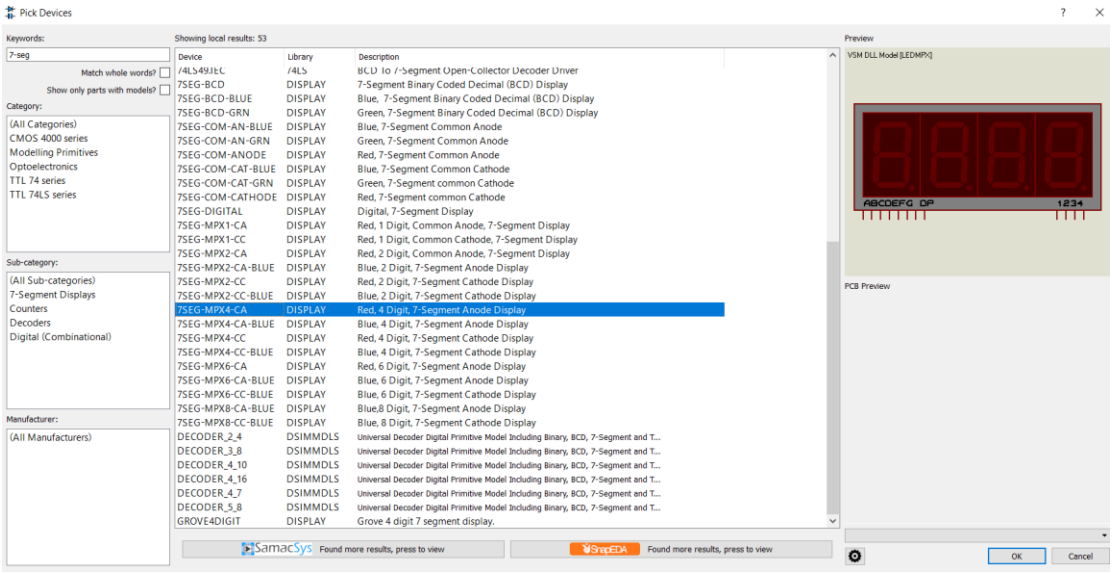
In Proteus we can select common cathode or common Anode 7 segment display for 1,2,4,6 or 8 Digits.



This is a CC 7-Seg Display for one digit.

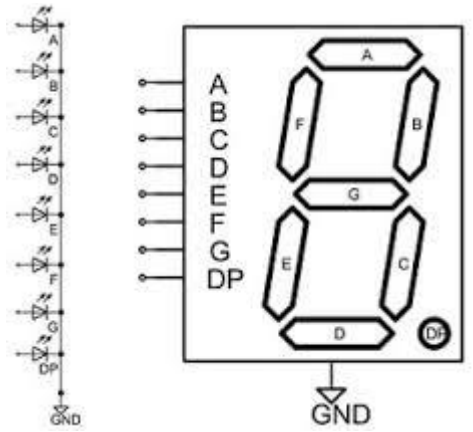


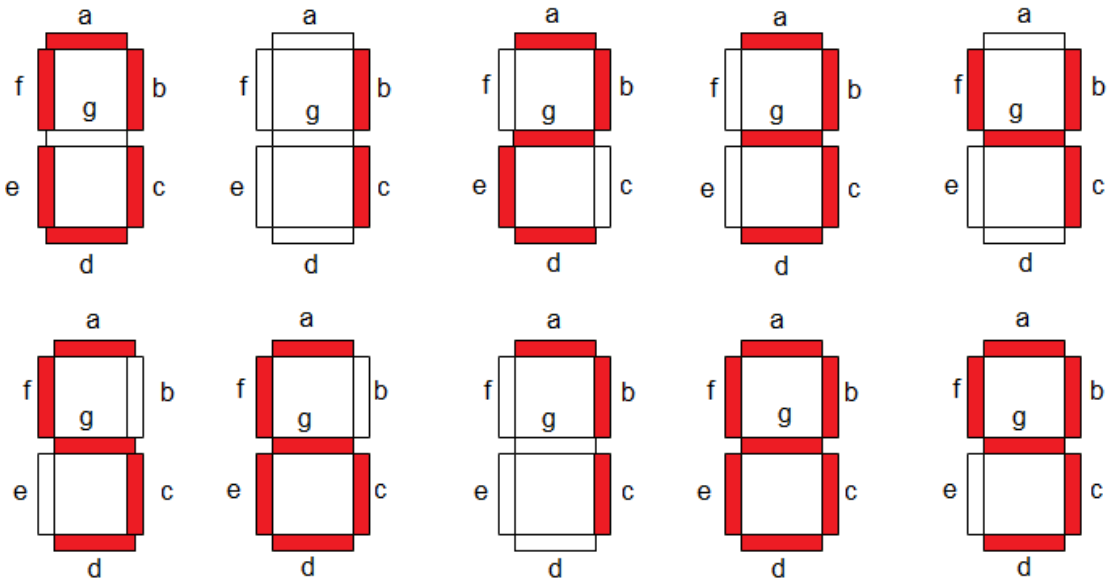
This is a CC 7-Seg Display for two digits.



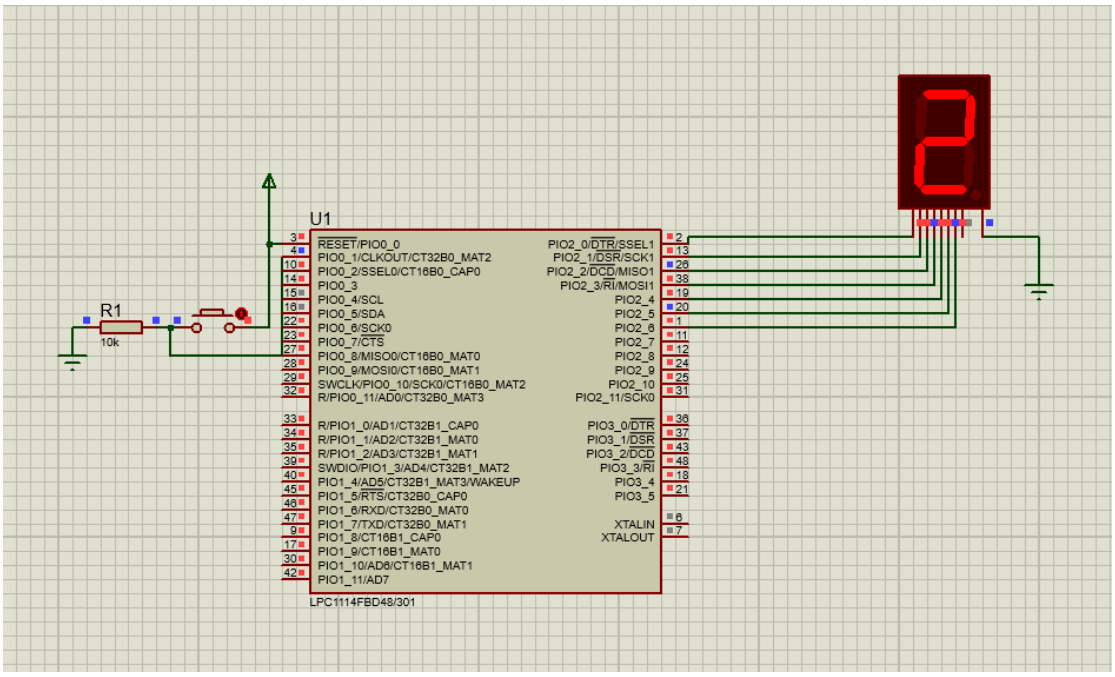
This is a CA 7-Seg Display for four digits.

7-Seg Encoding





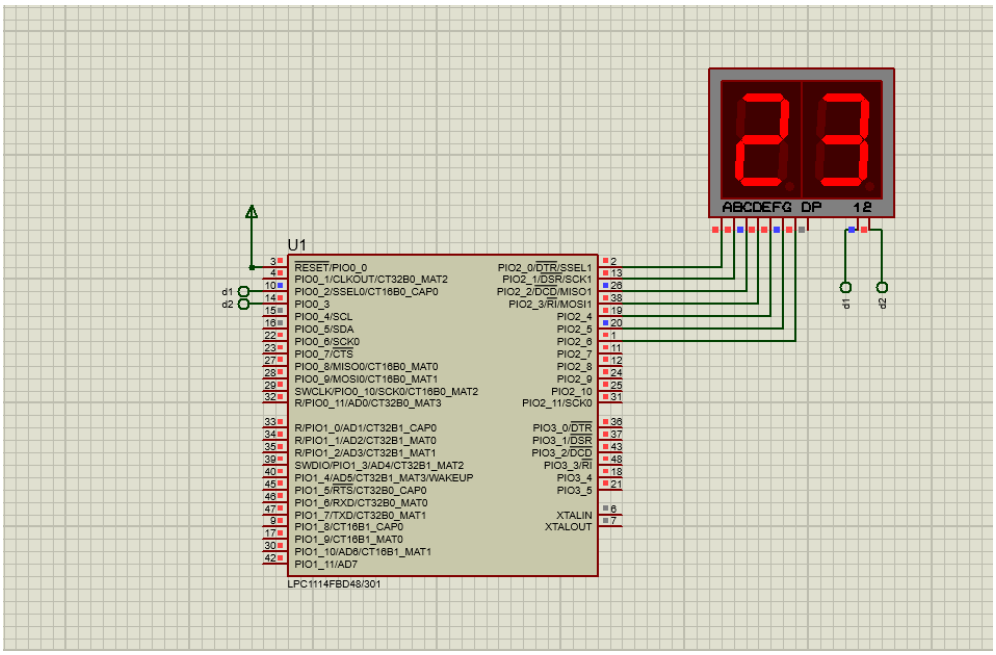
Lab work #1




```
#include <LPC11xx.h>
#define GPIO0DIR (*((volatile unsigned long *)0x50008000))
#define GPIO0DATA (*((volatile unsigned long *)0x50003ffc))
#define GPIO2DIR (*((volatile unsigned long *)0x50028000))
#define GPIO2DATA (*((volatile unsigned long *)0x50023ffc))

int main (void)
 {
  int seven_seg_encoder [] = {
0x3f,
0x06,
0x5b,
0x4f,
0x66,
0x6d,
0x7d,
0x07,
0xff,
0x6f
};
int num=0;
int i =0;
GPIO2DIR |= 0b1111111;
   while (1) {
     if (GPIO0DATA &0b10) {
       GPIO2DATA = seven_seg_encoder[num];
       num=(num+1) %10;
       for (i=0; i<400000; i++);
       //while (GPIO0DATA &0b10);
     } }
   return 0;
 }
```

Lab work #2




```
#include <LPC11xx.h>
#define GPIO0DIR (*((volatile unsigned long *)0x50008000))
#define GPIO0DATA (*((volatile unsigned long *)0x50003ffc))
#define GPIO2DIR (*((volatile unsigned long *)0x50028000))
#define GPIO2DATA (*((volatile unsigned long *)0x50023ffc))
int main (void)
 {
   int seven_seg_encoder [] = {
0x3f,
0x06,
0x5b,
0x4f,
0x66,
0x6d,
0x7d,
0x07,
0xff,
0x6f
};
int num=0;
int i =0;
GPIO2DIR |= 0x3F;
GPIO0DIR |= 0b1100;
  while (1) {
        GPIO0DATA=0b0100;
        GPIO2DATA = seven_seg_encoder[(num)%10];
         for (i =0; i<50000; i++);

        GPIO0DATA=0b1000;
       GPIO2DATA = seven_seg_encoder[(num/10) %10];
       for (i =0; i<90000; i++);
       num++;
}
  return 0;}
```

Homework

Use a Common- Anode 7-Segment Display for 4 digits to count from 555 to 0, when reaching to 0 a red led connected to port 1 must shine.