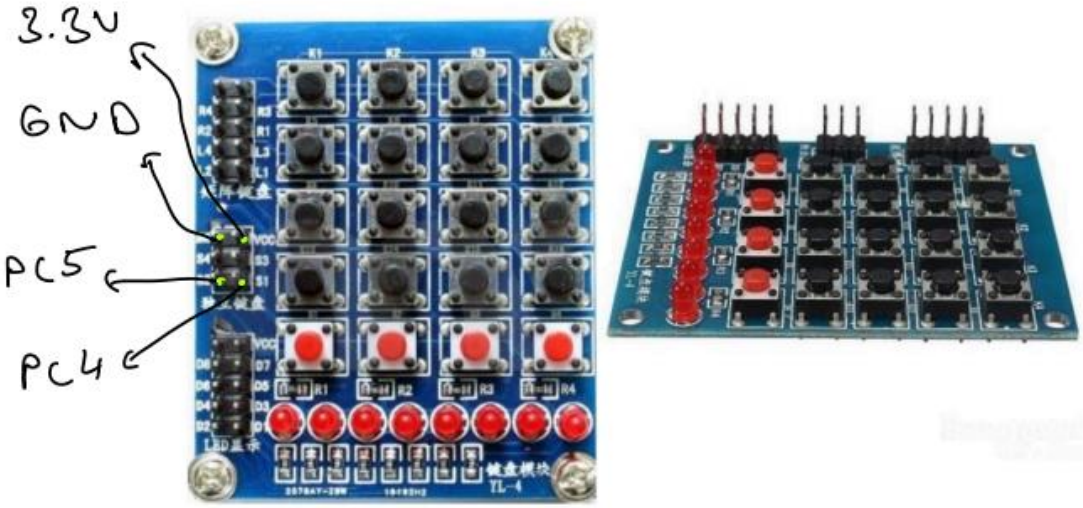
EE-447 Preliminary work

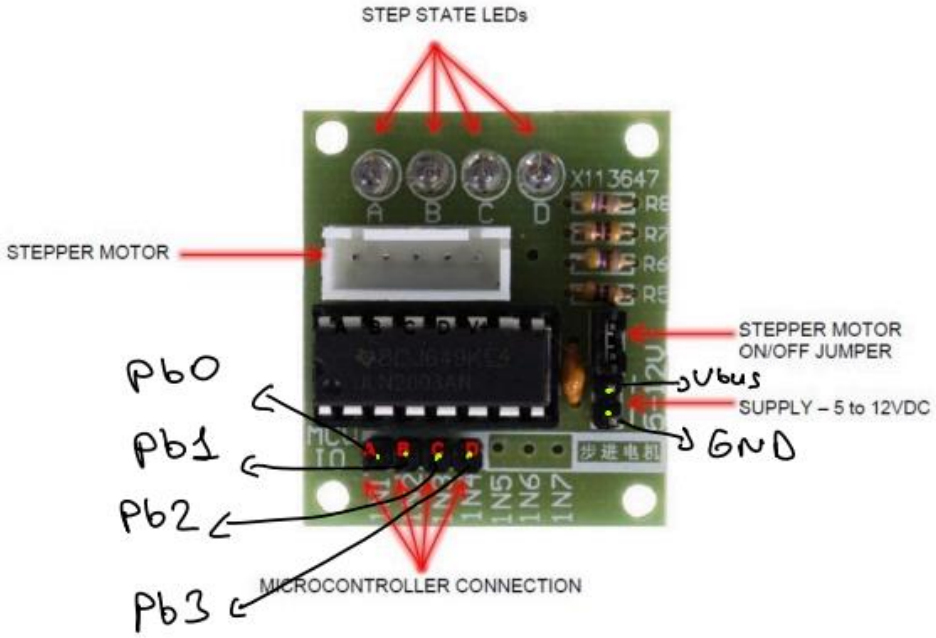
Q1

C:\Users\orhan\OneDrive\Masaüstü\Lab3\Q1\q1.c

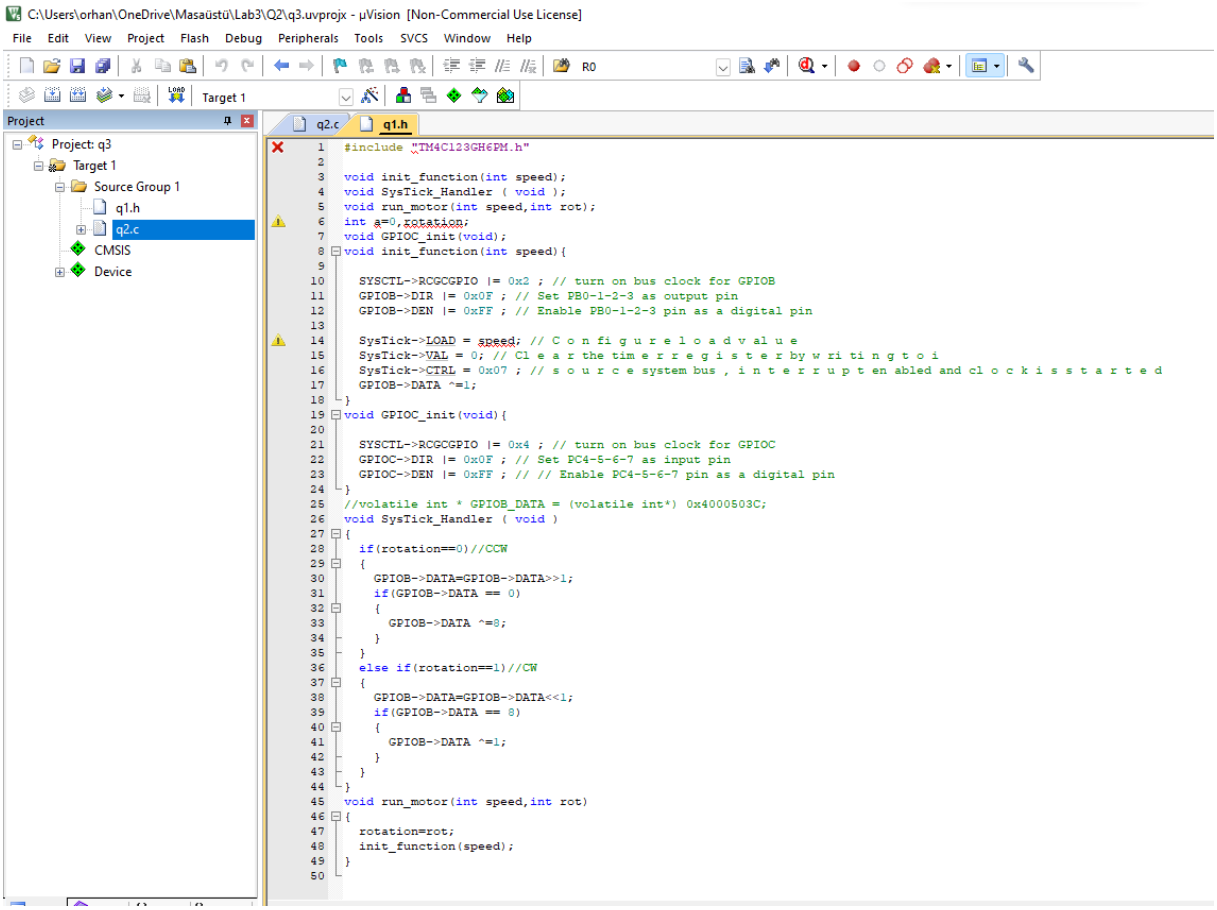
```c
#include "TM4C123GH6PM.h"

void init_function(int speed);
void SysTick_Handler ( void );
void run_motor(int speed,int rot);
int a=0,rotation;
void GPIOC_init(void);
void init_function(int speed){

  SYSCTL->RCGCGPIO |= 0x2 ; // turn on bus clock for GPIOB
  GPIOB->DIR |= 0x0F ; // Set PB0-1-2-3 as output pin
  GPIOB->DEN |= 0xFF ; // Enable PB0-1-2-3 pin as a digital pin

  SysTick->LOAD = speed; // C o n fi g u r e l o a d v al u e
  SysTick->VAL = 0; // Cl e a r the tim e r r e g i s t e r by w ri ti n g t o i
  SysTick->CTRL = 0x07 ; // s o u r c e system bus , i n t e r r u p t en abled and cl o c k i s s t
a r t e d
  GPIOB->DATA ^=1;
}
void GPIOC_init(void){

  SYSCTL->RCGCGPIO |= 0x4 ; // turn on bus clock for GPIOC
  GPIOC->DIR |= 0x0F ; // Set PC4-5-6-7 as input pin
  GPIOC->DEN |= 0xFF ; // Enable PC4-5-6-7 pin as a digital pin
}
//volatile int * GPIOB_DATA = (volatile int*) 0x4000503C;
void SysTick_Handler ( void )
{
  if(rotation==0)//CCW
  {
    GPIOB->DATA=GPIOB->DATA>>1;
    if(GPIOB->DATA == 0)
    {
      GPIOB->DATA ^=8;
    }
  }
  else if(rotation==1)//CW
  {
    GPIOB->DATA=GPIOB->DATA<<1;
    if(GPIOB->DATA == 8)
    {
      GPIOB->DATA ^=1;
    }
  }
}
void run_motor(int speed,int rot)
{
  rotation=rot;
  init_function(speed);
}
int main()
{
  rotation=1;
  run_motor(159999,rotation);//0 means CCW,1 means CW
  while(1)
  {
    a++;
  }

}
```

Q2


3.3V
GND
PC5
PC4
TL-4

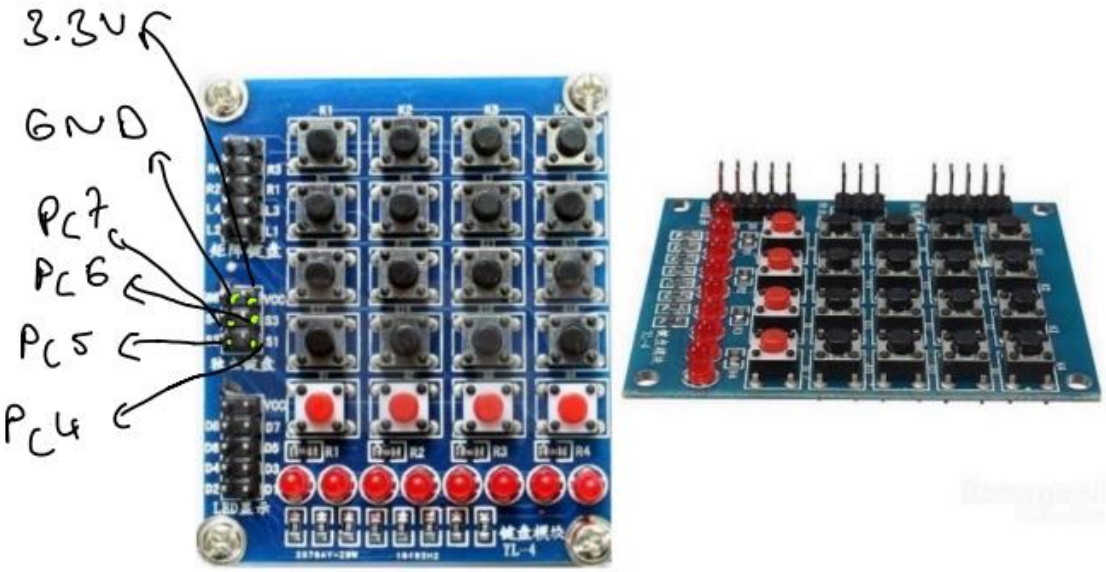

STEP STATE LEDs
STEPPER MOTOR
STEPPER MOTOR
ON/OFF JUMPER
Vbus
SUPPLY – 5 to 12VDC
GND
Pb0
Pb1
Pb2
Pb3
MICROCONTROLLER CONNECTION

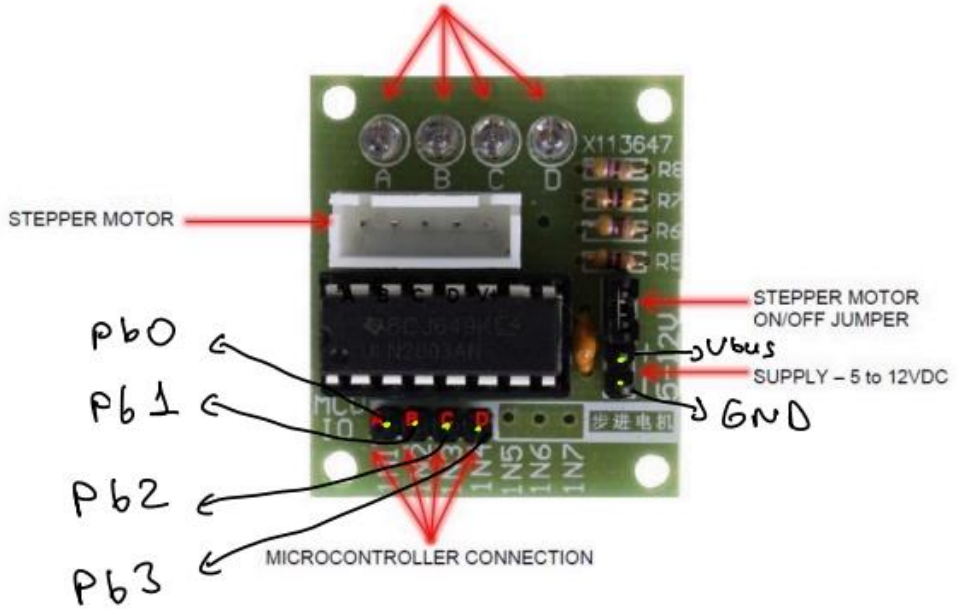
Q3


C:\Users\orhan\OneDrive\Masaüstü\Lab3\Q2\q3.uvprojx - µVision [Non-Commercial Use License]
File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Target 1
Project
Project: q3
Target 1
Source Group 1
q1.h
q2.c
CMSIS
Device
q2.c
q1.h
#include "TM4C123GH6PM.h"
void init_function(int speed);
void SysTick_Handler (void);
void run_motor(int speed,int rot);
int a=0,rotation;
void GPIOC_init(void);
void init_function(int speed){
SYSCTL->RCGCGPIO |= 0x2 ; // turn on bus clock for GPIOB
GPIOB->DIR |= 0x0F ; // Set PB0-1-2-3 as output pin
GPIOB->DEN |= 0xFF ; // Enable PB0-1-2-3 pin as a digital pin
SysTick->LOAD = speed; // C o n fi g u r e l o a d v al u e
SysTick->VAL = 0; // Cl e a r the tim e r r e g i s t e r by w ri ti n g t o i
SysTick->CTRL = 0x07 ; // s o u r c e system bus , i n t e r r u p t en abled and cl o c k i s s t a r t e d
GPIOB->DATA ^=1;
}
void GPIOC_init(void){
SYSCTL->RCGCGPIO |= 0x4 ; // turn on bus clock for GPIOC
GPIOC->DIR |= 0x0F ; // Set PC4-5-6-7 as input pin
GPIOC->DEN |= 0xFF ; // // Enable PC4-5-6-7 pin as a digital pin
}
//volatile int * GPIOB_DATA = (volatile int*) 0x4000503C;
void SysTick_Handler (void)
{
if(rotation==0)//CCW
{
GPIOB->DATA=GPIOB->DATA>>1;
if(GPIOB->DATA == 0)
{
GPIOB->DATA ^=8;
}
}
else if(rotation==1)//CW
{
GPIOB->DATA=GPIOB->DATA<<1;
if(GPIOB->DATA == 8)
{
GPIOB->DATA ^=1;
}
}
}
void run_motor(int speed,int rot)
{
rotation=rot;
init_function(speed);
}

```c
#include "TM4C123GH6PM.h"
#include "ql.h"
int main()
{
//run_motor(159999,0);//0 means CCW,1 means CW
  GPIOC_init();
  int dummy_index=0,speed=159999;
  //run_motor(159999,1);
while(1)
  {
    a++;
    if(GPIOC->DATA == 0xED)
    {
      while(GPIOC->DATA == 0xED)
      {
        dummy_index++;
      }
      rotation=1;
      run_motor(speed,rotation);
    }
    else if(GPIOC->DATA == 0xDD)
    {
      while(GPIOC->DATA == 0xDD)
      {
        dummy_index++;
      }
      rotation=0;
      run_motor(speed,rotation);
    }

  }

}
```

Q4


3.3V
GND
PC7
PC6
PC5
PC4


STEPPER MOTOR
STEPPER MOTOR
ON/OFF JUMPER
VBUS
SUPPLY – 5 to 12VDC
GND
PB0
PB1
PB2
PB3
MICROCONTROLLER CONNECTION

Q5

```
#include "TM4C123GH6PM.h"
#include "ql.h"
int main()
{
//run_motor(159999,0);//0 means CCW,1 means CW
  GPIOC_init();
  int dummy_index=0,speed=1599999;
  //run_motor(159999,1);
while(1)
  {
    a++;
    if(GPIOC->DATA == 0xED)
    {
      while(GPIOC->DATA == 0xED)
      {
        dummy_index++;
      }
      rotation=1;
      run_motor(speed,rotation);
    }
    else if(GPIOC->DATA == 0xDD)
    {
      while(GPIOC->DATA == 0xDD)
      {
        dummy_index++;
      }
      rotation=0;
      run_motor(speed,rotation);
    }
    else if(GPIOC->DATA == 0xBD)
    {
      while(GPIOC->DATA == 0xBD)
      {
        dummy_index++;
      }
      speed=speed/2;
      run_motor(speed,rotation);
    }
    else if(GPIOC->DATA == 0x7D)
    {
      while(GPIOC->DATA == 0x7D)
      {
        dummy_index++;
      }
      speed=speed*2;
      run_motor(speed,rotation);
    }

  }

}
```