

TRƯỜNG ĐẠI HỌC NHA TRANG

KHOA CÔNG NGHỆ THÔNG TIN

**Lập Trình Thiết Bị Nhúng**

**Báo Cáo Môn Học**

Giảng viên hướng dẫn:



* Người thực hiện :

Cao Thái Toàn Phong

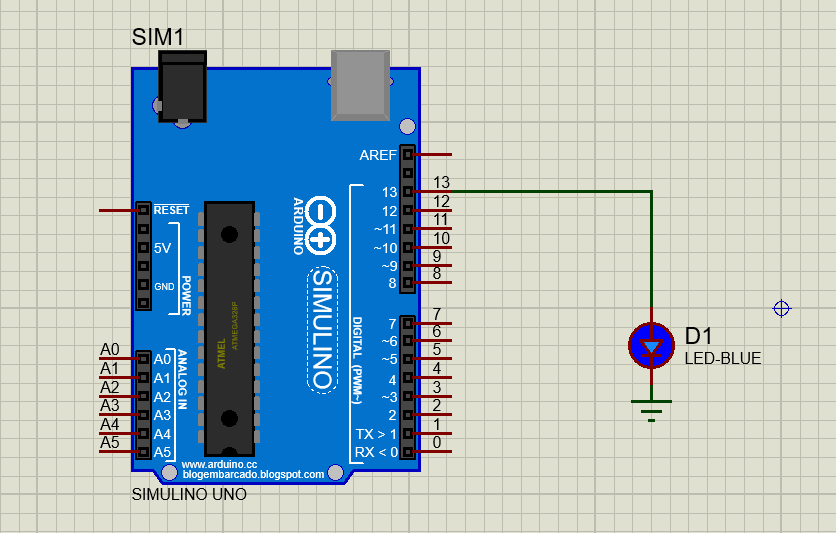
# Bài 1: Blinking LED

## Mô tả

* Bài này thực hiện việc lập trình điều khiển 1 đèn LED

bật/tắt trong khoảng thời gian 0,2 giây, đèn LED được kết nối vào chân số 13 của board mạch.

## Sơ đồ mạch



Sơ đồ kết nối của hệ thống

## Linh kiện

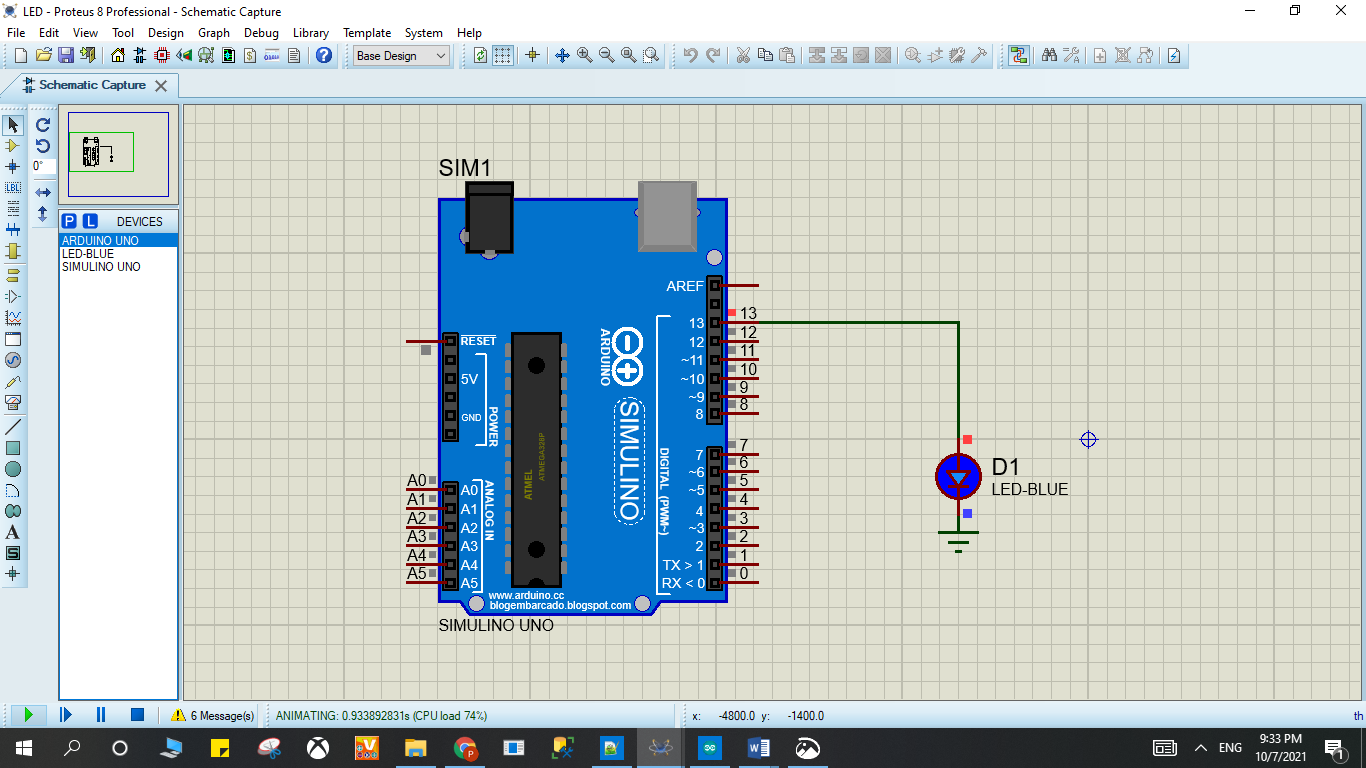
#### 1 mạch Arduino Uno

#### 1 đèn LED-BLUE

## Code chương trình

|  |
| --- |
| int pin=13;  void setup() {  // put your setup code here, to run once:  pinMode(pin,OUTPUT);  }  void loop() {  // main code  digitalWrite(pin,HIGH);  delay(200); // 0,2s  digitalWrite(pin,LOW);  delay(200);  } |

## Kết quả chạy chương trình



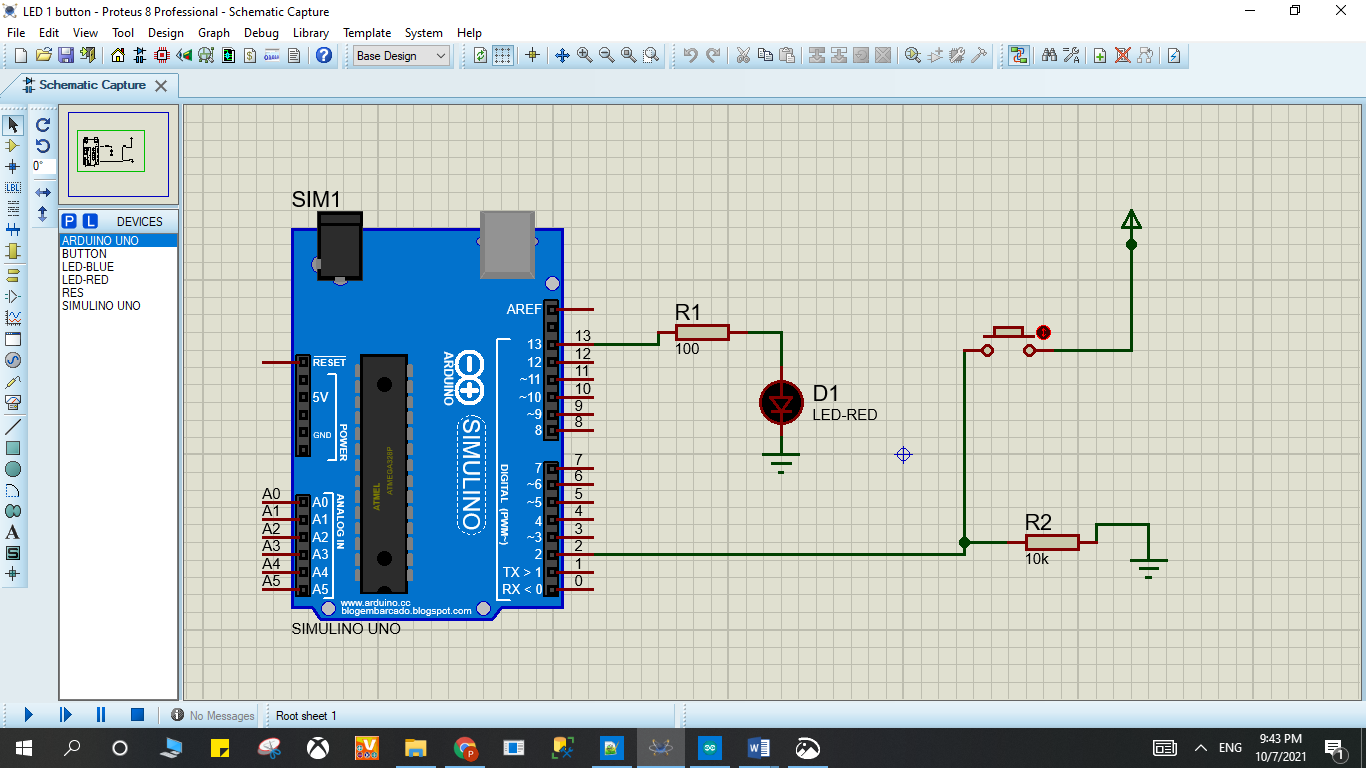
Sơ đồ kết nối của hệ thống

# Bài 2: Turn on LED with button

## Mô tả

* Bài này thực hiện việc bật/tắt 1 đèn LED trong khoảng thời gian 1 giây bằng button, đèn LED được kết nối vào chân số 13 của board mạch, button được kết nối vào chân số 2 của board mạch, đèn sáng khi nút nhấn và ngược lại.

## Sơ đồ mạch



Sơ đồ kết nối của hệ thống

## Linh kiện

#### 1 mạch Arduino Uno

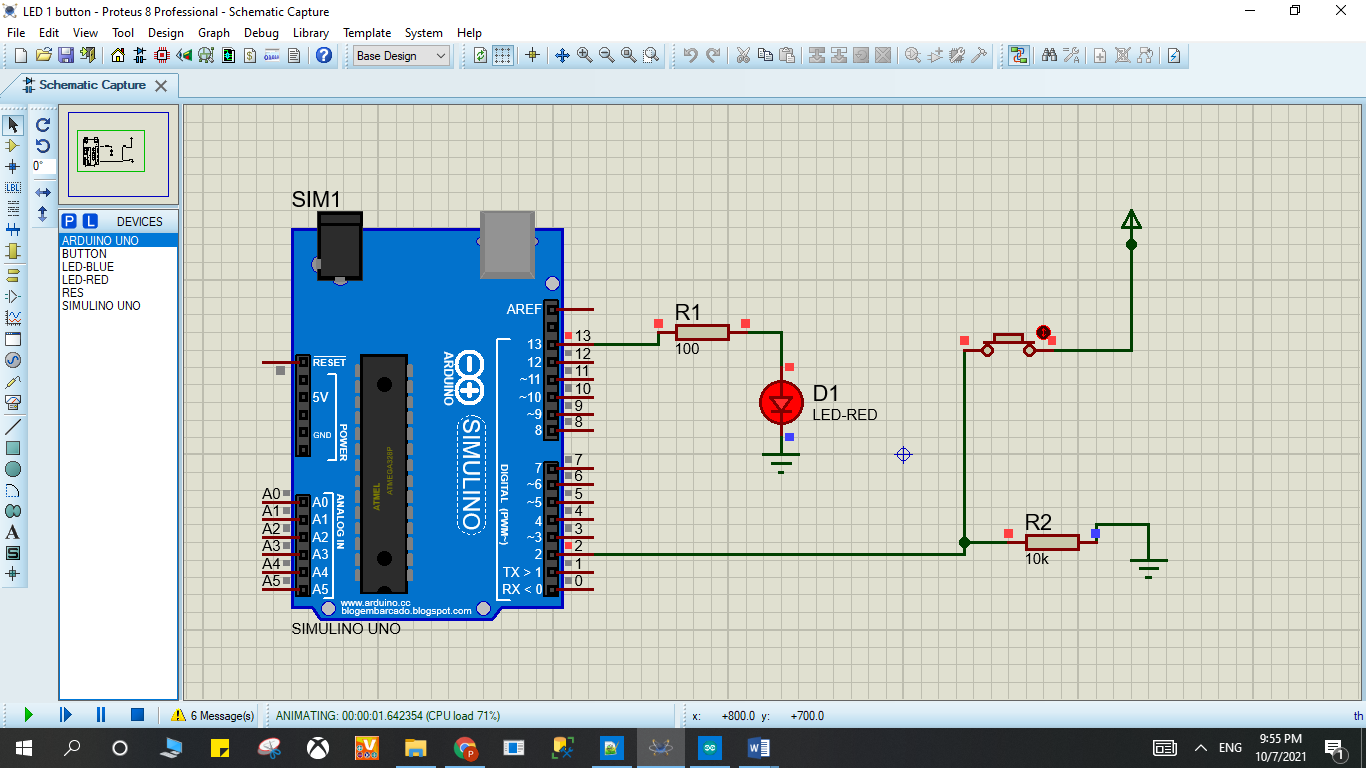
#### 1 đèn LED-RED

#### 1 điện trở 100Ω và 1 điện trở 10k Ω

## Code chương trình

|  |
| --- |
| int x = 0;  void setup() {  pinMode(2, INPUT);  pinMode(13, OUTPUT);  }  void loop()  {  // đọc cổng 2  x = digitalRead(2);  if (x == HIGH) {  digitalWrite(13, HIGH); // LED ON  } else {  digitalWrite(13, LOW); //LED OFF  }  delay(1000); // wait 1s  } |

## Kết quả chạy chương trình



Sơ đồ kết nối của hệ thống

# Bài 3. LED RGB

## Mô tả

* Bài này thực hiện việc lập trình bật 1 đèn LED RGB với 3 điện trở R1, R2 R3, đèn LED được kết nối thông qua điện trở lần lượt vào chân số 9, 10,11 của board mạch.

## Sơ đồ mạch

### 

Sơ đồ kết nối của hệ thống

## Linh kiện

#### 1 mạch Arduino Uno

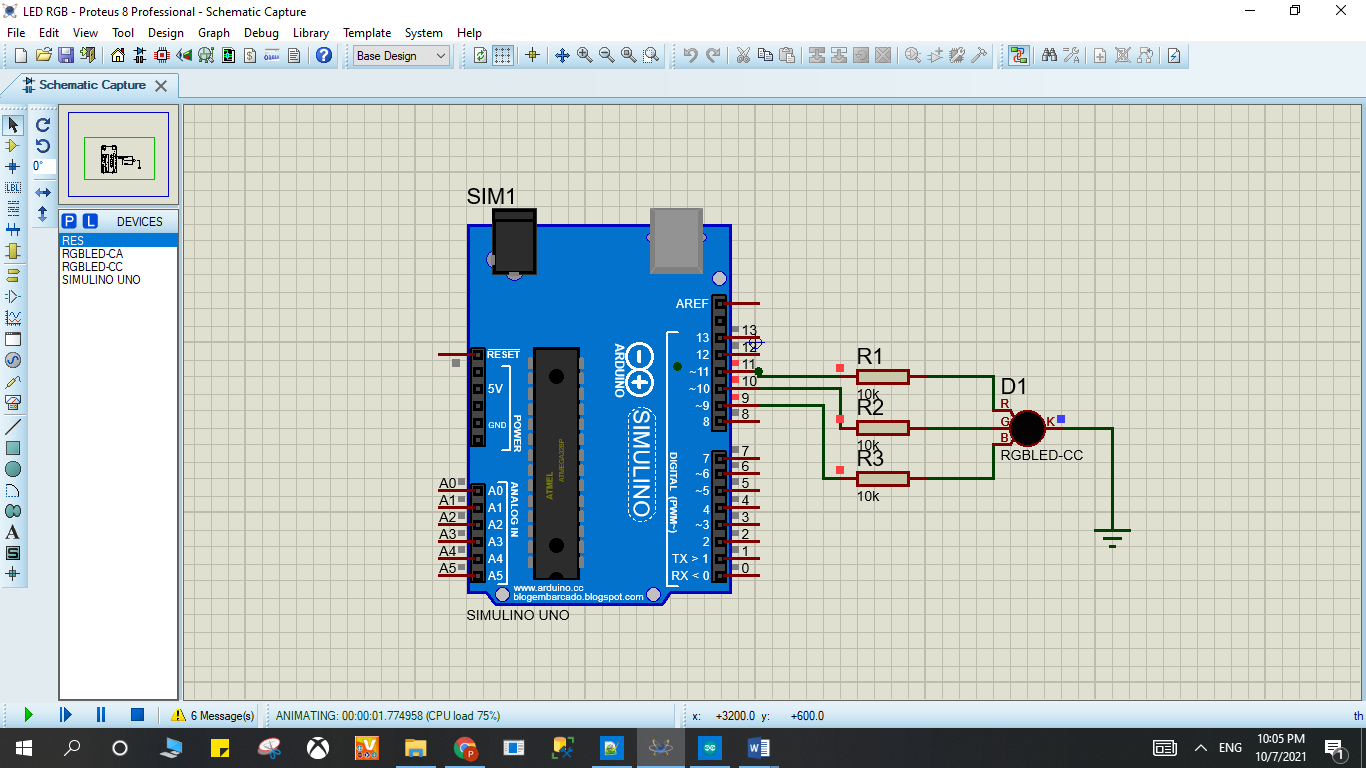
#### 1 đèn RGBLED-CC

#### 3 điện trở 10k Ω

## Code chương trình

|  |
| --- |
| int counter;  void setup()  {  pinMode(11, OUTPUT);  pinMode(10, OUTPUT);  pinMode(9, OUTPUT);  }  void loop()  {  analogWrite(11, 255);  analogWrite(10, 0);  analogWrite(9, 0);  delay(1000); // Wait for 1000 millisecond(s)  analogWrite(11, 255);  analogWrite(10, 255);  analogWrite(9, 255);  delay(1000); // Wait for 1000 millisecond(s)  for (counter = 0; counter < 10; ++counter) {  analogWrite(11, 255);  analogWrite(10, 255);  analogWrite(9, 0);  delay(1000); // Wait for 1000 millisecond(s)  analogWrite(11, 51);  analogWrite(10, 255);  analogWrite(9, 51);  delay(1000); // Wait for 1000 millisecond(s)  }  } |

## Kết quả chạy chương trình

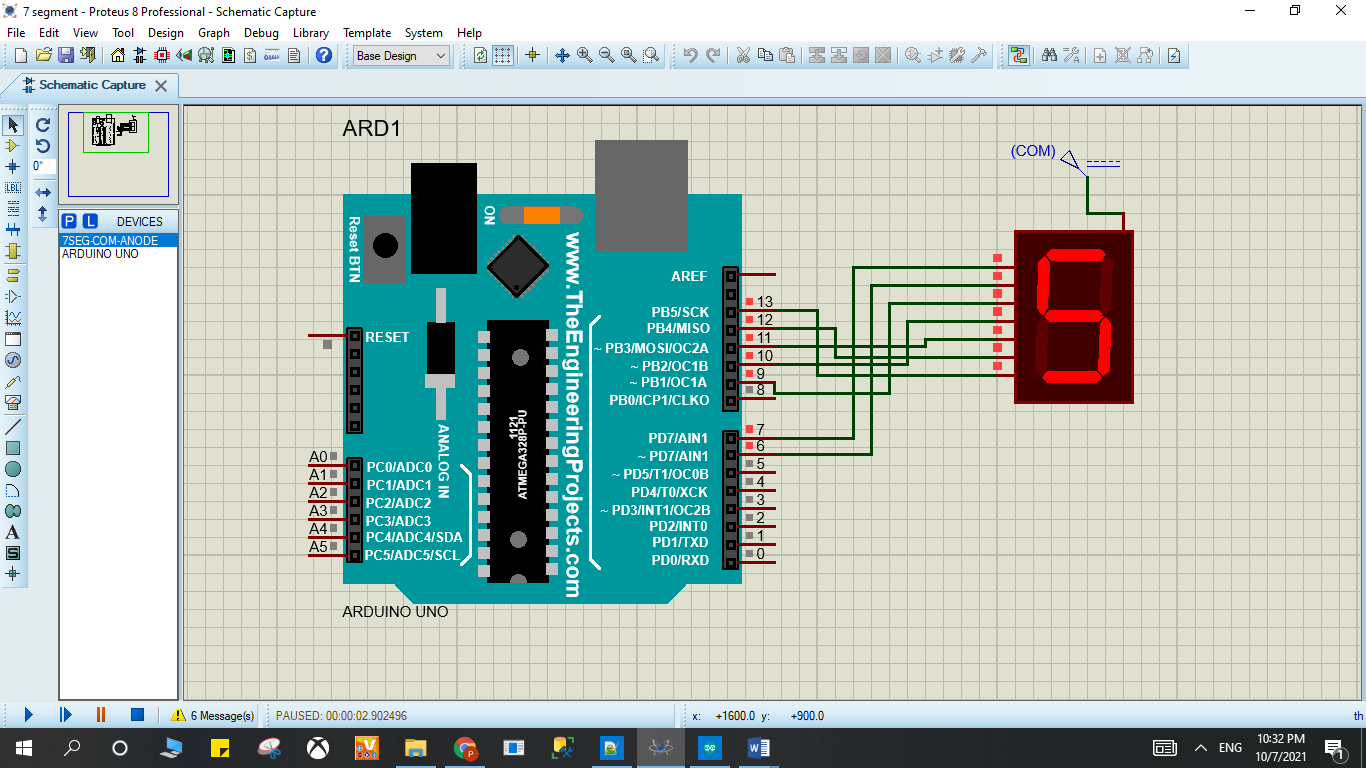


# Bài 4. LED 7-Segment

## Mô tả

* Bài này thực hiện việc lập trình 1 đèn LED 7 đoạn hiển thị các số từ 0 đến 9 trong khoảng thời gian 0,5 giây, đèn LED được kết nối vào các chân số 6, 7, 9, 10, 11,13 của board mạch.

## Sơ đồ mạch và kết quả chạy chương trình



Sơ đồ kết nối của hệ thống

## Linh kiện

#### 1 mạch Arduino Uno

#### 1 đèn 7-SEG-COM-ANODE

## Code chương trình

|  |
| --- |
| int f = 13;  int g = 12;  int e = 11;  int d = 10;  int c = 9;  int b = 6;  int a = 7;  int hoan = 500;  void setup() {  pinMode(f, OUTPUT);  pinMode(g, OUTPUT);  pinMode(e, OUTPUT);  pinMode(d, OUTPUT);  pinMode(c, OUTPUT);  pinMode(b, OUTPUT);  pinMode(a, OUTPUT);  }  void loop()  {  // display from 0 to 9  digitalWrite(a,0);  digitalWrite(b,0);  digitalWrite(c,0);  digitalWrite(d,0);  digitalWrite(e,0);  digitalWrite(f,0);  digitalWrite(g,1);  delay(hoan);    digitalWrite(a,1);  digitalWrite(b,0);  digitalWrite(c,0);  digitalWrite(d,1);  digitalWrite(e,1);  digitalWrite(f,1);  digitalWrite(g,1);  delay(hoan);    digitalWrite(a,0);  digitalWrite(b,0);  digitalWrite(c,1);  digitalWrite(d,0);  digitalWrite(e,0);  digitalWrite(f,1);  digitalWrite(g,0);  delay(hoan);    digitalWrite(a,0);  digitalWrite(b,0);  digitalWrite(c,0);  digitalWrite(d,0);  digitalWrite(e,1);  digitalWrite(f,1);  digitalWrite(g,0);  delay(hoan);    digitalWrite(a,1);  digitalWrite(b,0);  digitalWrite(c,0);  digitalWrite(d,1);  digitalWrite(e,1);  digitalWrite(f,0);  digitalWrite(g,0);  delay(hoan);  digitalWrite(a,0);  digitalWrite(b,1);  digitalWrite(c,0);  digitalWrite(d,0);  digitalWrite(e,1);  digitalWrite(f,0);  digitalWrite(g,0);  delay(hoan);    digitalWrite(a,0);  digitalWrite(b,1);  digitalWrite(c,0);  digitalWrite(d,0);  digitalWrite(e,0);  digitalWrite(f,0);  digitalWrite(g,0);  delay(hoan);    digitalWrite(a,0);  digitalWrite(b,0);  digitalWrite(c,0);  digitalWrite(d,1);  digitalWrite(e,1);  digitalWrite(f,1);  digitalWrite(g,1);  delay(hoan);    digitalWrite(a,0);  digitalWrite(b,0);  digitalWrite(c,0);  digitalWrite(d,0);  digitalWrite(e,0);  digitalWrite(f,0);  digitalWrite(g,0);  delay(hoan);    digitalWrite(a,0);  digitalWrite(b,0);  digitalWrite(c,0);  digitalWrite(d,1);  digitalWrite(e,1);  digitalWrite(f,0);  digitalWrite(g,0);  delay(hoan);  } |

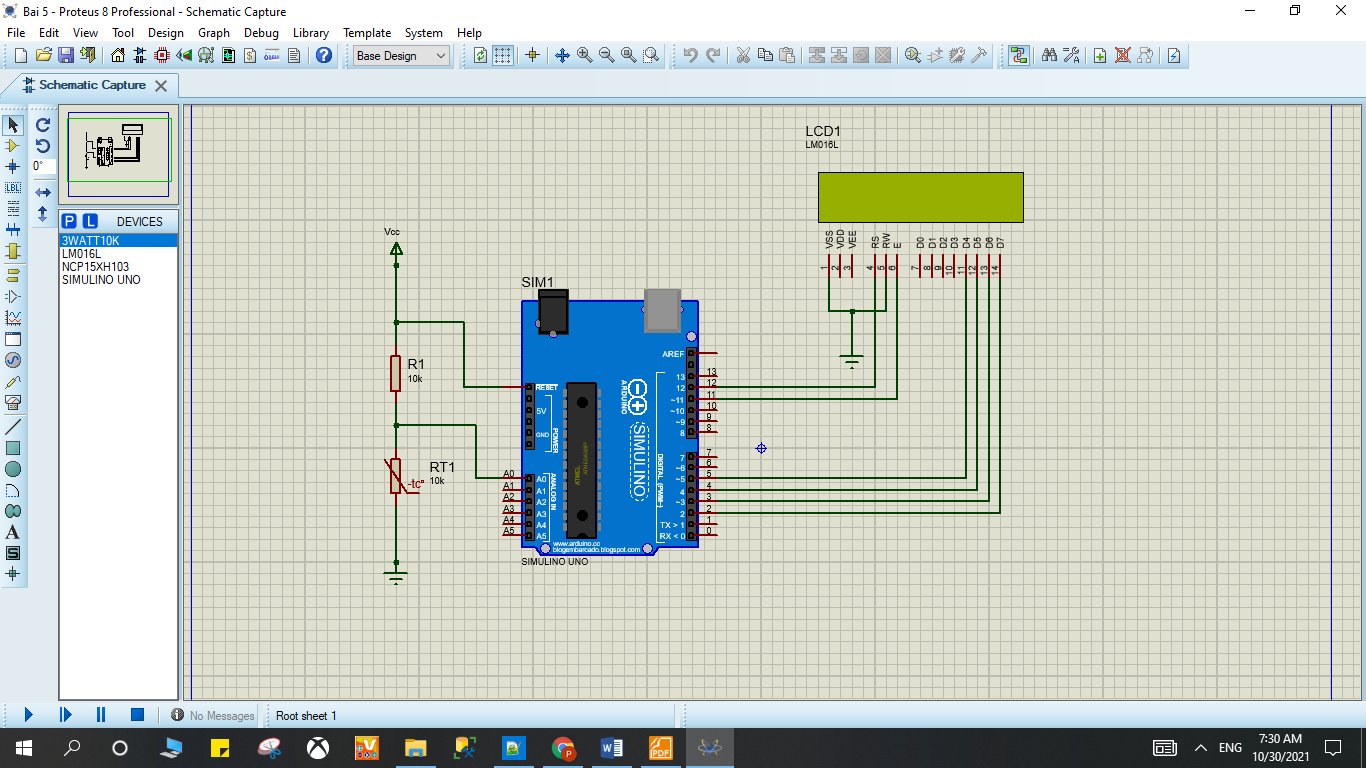
# Bài 5. Temperature Sensor

## Mô tả

## Bài này thực hiện việc lập trình 1 hệ thống cảm biến nhiệt độ sử dụng nhiệt điện trở NCP15XH103

## và hiển thị nhiệt độ đo được qua màn hình LCD

## Sơ đồ mạch và kết quả chạy chương trình



Sơ đồ kết nối của hệ thống 7

## Linh kiện

#### 1 mạch Arduino Uno

#### 1 bảng dữ liệu LM016L LCD

#### 1 nhiệt điện trở NCP15XH103

#### 1 điện trở 3WATT10K

## Code chương trình

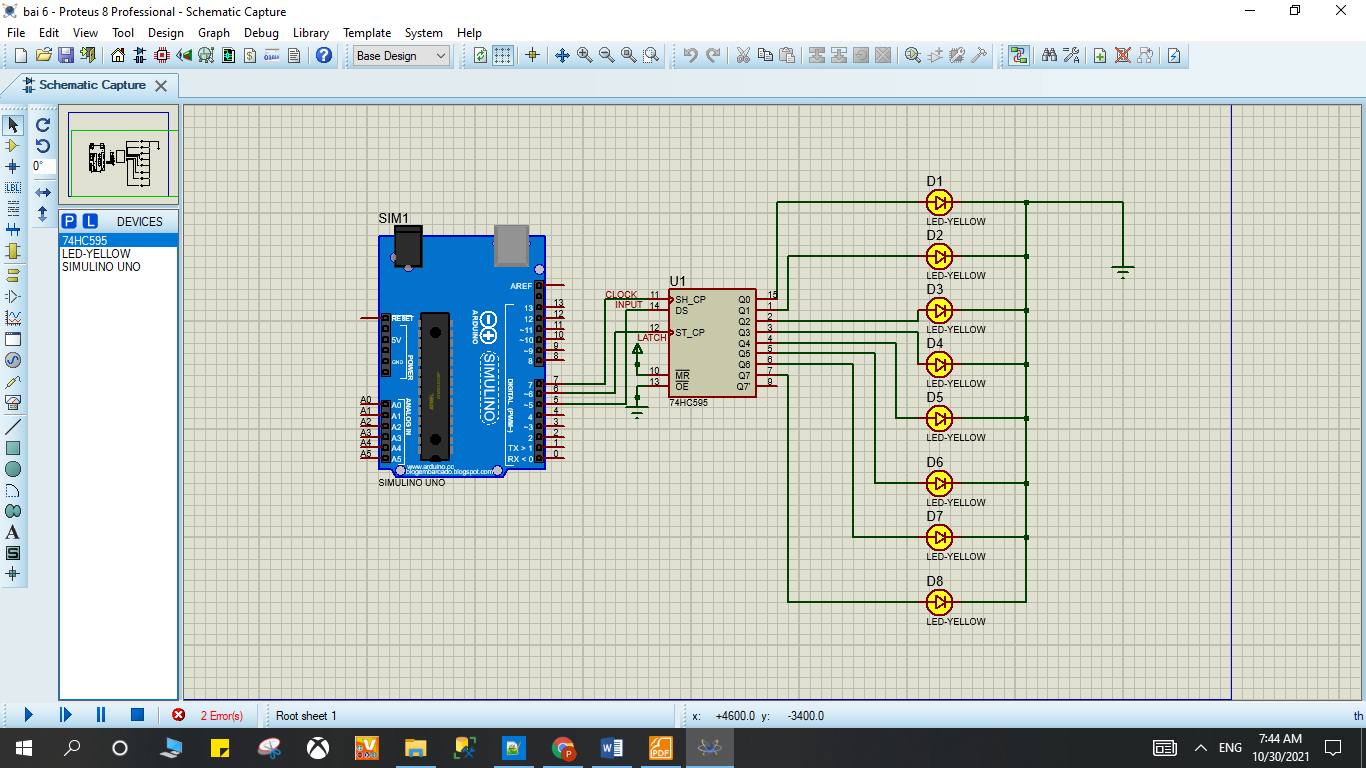
|  |
| --- |
| #include <LiquidCrystal.h>  int THERMISTORPIN = 0, BCOEFFICIENT = 3380 ;  float THERMISTORNOMINAL = 10000 , TEMPERATURENOMINAL = 25 , SERIESRESISTOR = 10000 ;  LiquidCrystal lcd(12, 11, 5, 4, 3, 2);  int sample[5];  void setup() {  Serial.begin(9600);  lcd.begin(16, 2);  }  void loop() {  int i;  float average;    // lấy N mẫu liên tiếp  for (i=0; i< 5; i++) {  sample[i] = analogRead(THERMISTORPIN);  delay(10);  }  average = 0;    for (i=0; i< 5; i++) {  average += sample[i];    }  average /= 5;  // chuyển đổi giá trị qua điện trở  average = 1023 / average - 1;  average = SERIESRESISTOR / average;      float steinhart;  steinhart = average / THERMISTORNOMINAL;  steinhart = log(steinhart);  steinhart /= BCOEFFICIENT;  steinhart += 1.0 / (TEMPERATURENOMINAL + 273.15);  steinhart = 1.0 / steinhart;  steinhart -= 273.15; // chuyển đổi sang độ C  lcd.print("Temp = ");  lcd.print((int)steinhart);  lcd.print(" C");  delay(500);  lcd.clear();  } |

# Bài 6. 8 LED

## Mô tả

## Bài này thực hiện bật sáng 8 đèn led theo một trình tự, sử dụng IC 74HC545.

## Sơ đồ mạch và kết quả chạy chương trình



Sơ đồ kết nối của hệ thống 8

## Linh kiện

#### 1 mạch Arduino Uno

#### 8 đèn LED-YELLOW

#### 1 IC 74HC545

## Code chương trình

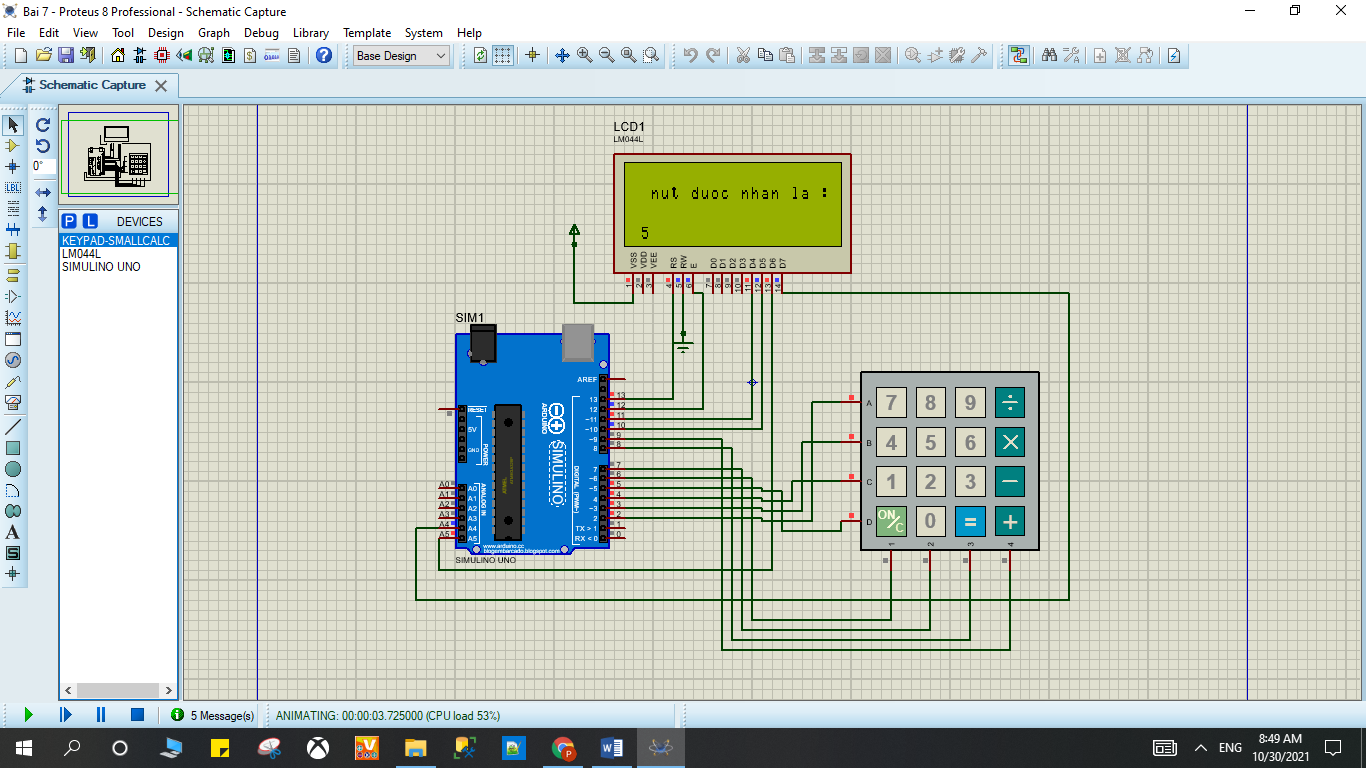
|  |
| --- |
| #define \_latch 6  #define \_clock 7  #define \_data 5  void setup()  {  pinMode(\_latch, OUTPUT);  pinMode(\_clock, OUTPUT);  pinMode(\_data, OUTPUT);  }  void loop()  {  for (int i =0;i< 256; i++)  //chot IC  {  digitalWrite(\_latch,LOW);  //day dl ra IC  int soLieu=255; //B11111111, hoac 0xff  shiftOut(\_data, \_clock, LSBFIRST,soLieu);  //mo chot, de IC out dl ra  digitalWrite(\_latch,HIGH);  delay(500);  }  } |

# Bài 7. Keypad

## Mô tả

## Bài này thực hiện hiển thị nút được nhấn ở Keypad lên màn hình LCD

## Sơ đồ mạch và kết quả chạy chương trình



Sơ đồ kết nối của hệ thống 8

## Linh kiện

#### 1 mạch Arduino Uno

#### 1 LCD LM044L

#### 1 Keypad 4x4

## Code chương trình

|  |
| --- |
| #include <LiquidCrystal.h>  #include "Keypad.h"  // LCD Setup  const int rs=13, en=12,d4=11,d5=10, d6=A5, d7=A4;  LiquidCrystal lcd(rs, en, d4, d5, d6, d7);  // Keypad Setup  const byte ROWS = 4; // Four Rows  const byte COLS = 4; // Four Columns  char keys[ROWS][COLS] = {  {'7','8','9','A'},  {'4','5','6','B'},  {'1','2','3','C'},  {'\*','0','#','D'}  };  byte rowPins[ROWS] = {2,3,4,5 }; // Arduino pins connected to the row pins of the keypad  byte colPins[COLS] = {6,7,8,9}; // Arduino pins connected to the column pins of the keypad  Keypad keypad\_key = Keypad( makeKeymap(keys), rowPins, colPins, ROWS, COLS ); // Keypad Library definition  void setup(void) {  // Hiển thị trên LCD  lcd.begin(16, 4); //LCD columns and rows  lcd.setCursor(0,1);  lcd.print(" Xin chao, ");  lcd.print("Hay nhap vao");  delay(2000);  }  void loop(){  char keypressed = keypad\_key.getKey(); // nhận gt được nhấn trên keypad  if (keypressed != NO\_KEY){ // check  lcd.clear();  lcd.setCursor(1, 1);  lcd.print(" nut duoc nhan la : ");  lcd.print(keypressed);  }  } |

# Bài 8. LED MATRIX 8x8

## Mô tả

Bài này thực hiện việc lập trình 1 dãy đèn LED ma trận 8x8 màu xanh dương kèm 2 IC 78HC595 hiển thị các số và chữ theo lập trình ở các file

file code\_test\_1 : Tất cả ô đèn trong dãy đèn đều sáng

file code\_test\_2 : Các đèn trong dãy đèn sẽ sáng từng bit theo hàng dọc từ trái sáng phải

file code\_test\_3 : sáng từng bit giống câu 2 nhưng chậm hơn để dễ quan sát ( delay sẽ chỉnh từ 100 thành 1000)

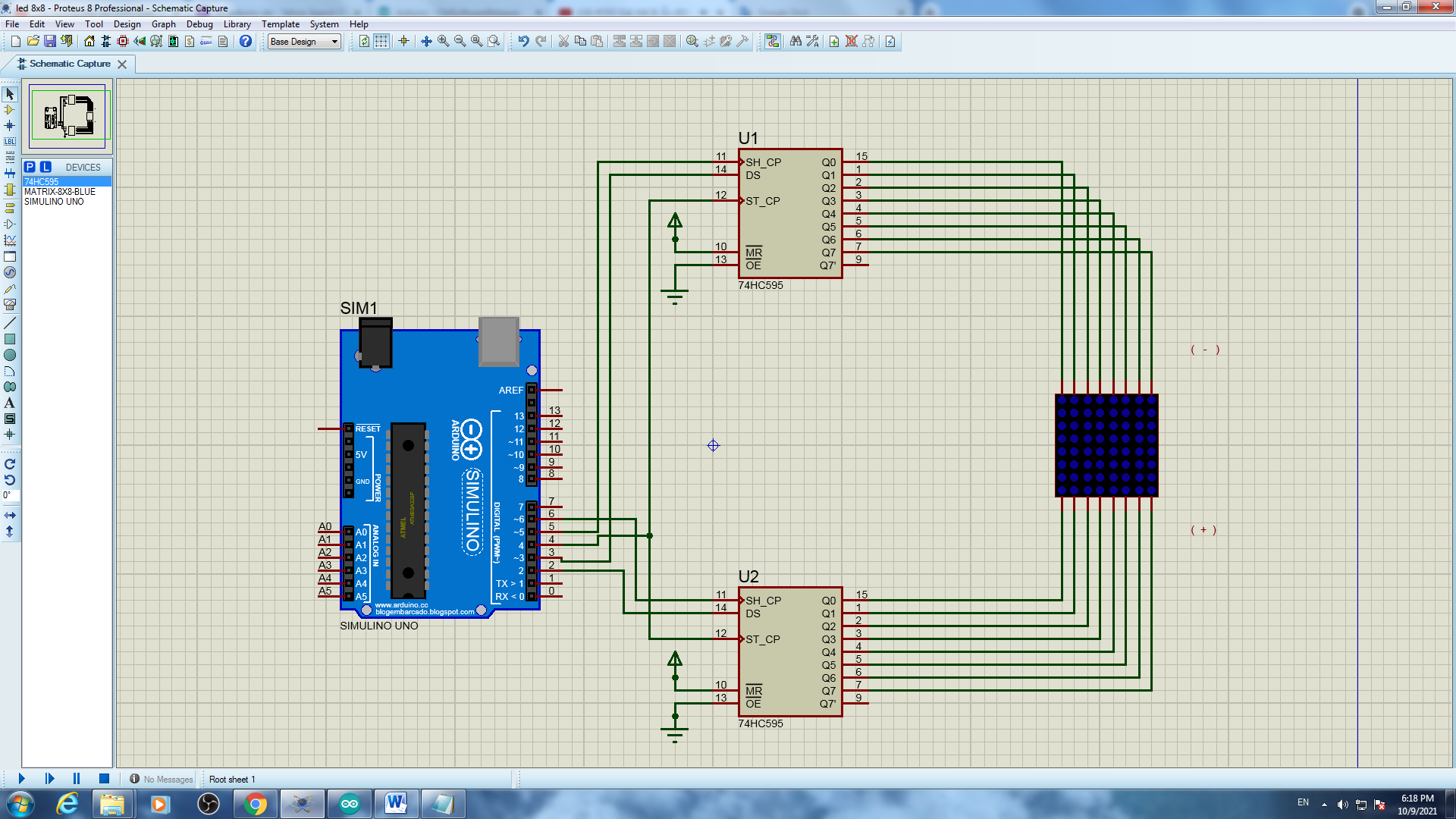
file code\_test\_4 : Hiển thị chữ A trong dãy đèn

file code\_test\_5 : Chạy tất cả chữ từ a đến z và từ 0 đến 9 trong dãy đèn

file code\_test\_6 : Hiển thị dòng chữ chứa từ happy new year , dòng chữ chạy từ trái sáng phải

file code\_test\_7 : Hiển thị dòng chữ chứa tên sinh viên kèm mã số sinh viên, dòng chữ chạy từ trái sáng phải

## Sơ đồ mạch



Sơ đồ kết nối của hệ thống 8

## Linh kiện

* 2 IC 78HC595
* 1 bảng đèn LED ma trận 8x8 màu xanh dương
* Mạch Arduino

## Code chương trình

* Code file code\_test\_1

|  |
| --- |
| #define DS\_cot 2  #define DS\_hang 3  #define SH\_CP\_hang 5  #define SH\_CP\_cot 6  #define ST\_CP 4  byte cot = 0b10000000;  void setup() {  pinMode(ST\_CP,OUTPUT);//RCLK    pinMode(DS\_hang,OUTPUT);//SER hang  pinMode(SH\_CP\_hang,OUTPUT);//SRCLK hang  pinMode(SH\_CP\_cot,OUTPUT);//SRCLK cot  pinMode(DS\_cot,OUTPUT);//SER cot  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b00000000);// hang 8 - hang 1  digitalWrite(ST\_CP,HIGH);  }  void loop() {  for(int i = 0; i < 8;i++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,cot >> i); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  } |

* Code file code\_test\_2

|  |
| --- |
| #define DS\_cot 2  #define DS\_hang 3  #define SH\_CP\_hang 5  #define SH\_CP\_cot 6  #define ST\_CP 4  byte cot = 0b10000000;  void setup() {  pinMode(ST\_CP,OUTPUT);//RCLK    pinMode(DS\_hang,OUTPUT);//SER hang  pinMode(SH\_CP\_hang,OUTPUT);//SRCLK hang  pinMode(SH\_CP\_cot,OUTPUT);//SRCLK cot  pinMode(DS\_cot,OUTPUT);//SER cot  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b00000000);// hang 8 - hang 1  digitalWrite(ST\_CP,HIGH);  }  void loop() {  for(int i = 0; i < 8;i++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,cot >> i); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(100);  }  } |

* Code file code\_test\_3

|  |
| --- |
| // code giống câu 2 nhưng sửa delay ở câu 2 thành 1000  delay(1000); |

* Code file code\_test\_4

|  |
| --- |
| #define DS\_cot 2  #define DS\_hang 3  #define SH\_CP\_hang 5  #define SH\_CP\_cot 6  #define ST\_CP 4  byte chu[][8] = {  {0xFF,0xC0,0x80,0xB7,0xB7,0x80,0xC0,0xFF} //A  };  byte cot = 0b10000000;  void setup() {  Serial.begin(9600);  pinMode(ST\_CP,OUTPUT);//RCLK    pinMode(DS\_hang,OUTPUT);//SER hang  pinMode(SH\_CP\_hang,OUTPUT);//SRCLK hang  pinMode(SH\_CP\_cot,OUTPUT);//SRCLK cot  pinMode(DS\_cot,OUTPUT);//SER cot  }  void loop() {  for(int i = 0; i < 8;i++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,chu[0][i]);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,cot >> i); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  } |

* Code file code\_test\_5

|  |
| --- |
| #define DS\_cot 2  #define DS\_hang 3  #define SH\_CP\_hang 5  #define SH\_CP\_cot 6  #define ST\_CP 4  byte chu[][8] = {  {0xFF,0xC0,0x80,0xB7,0xB7,0x80,0xC0,0xFF}, //A  {0xFF,0x80,0x80,0xB6,0xB6,0x80,0xC9,0xFF}, //B  {0xFF,0xC1,0x80,0xBE,0xBE,0x9C,0xDD,0xFF}, //C  {0xFF,0x80,0x80,0xBE,0xBE,0x80,0xC1,0xFF}, //D  {0xFF,0x80,0x80,0xB6,0xB6,0xBE,0xBE,0xFF},//E  {0xFF,0x80,0x80,0xB7,0xB7,0xBF,0xBF,0xFF},//F  {0xFF,0xC1,0x80,0xBE,0xBA,0x98,0xD9,0xFF},//G  {0xFF,0x80,0x80,0xF7,0xF7,0x80,0x80,0xFF},//H  {0xFF,0xFF,0xBE,0x80,0x80,0xBE,0xFF,0xFF},//I  {0xFF,0xF9,0xF8,0xBE,0x80,0x81,0xBF,0xFF},//J  {0xFF,0x80,0x80,0xE3,0xC9,0x9C,0xBE,0xFF},//K  {0xFF,0x80,0x80,0xFE,0xFE,0xFE,0xFE,0xFF},//L  {0xFF,0x80,0x80,0xCF,0xE7,0xCF,0x80,0x80},//M  {0xFF,0x80,0x80,0xCF,0xE7,0xF3,0x80,0x80},//N  {0xFF,0xC1,0x80,0xBE,0xBE,0x80,0xC1,0xFF},//O  {0xFF,0x80,0x80,0xBB,0xBB,0x83,0xC7,0xFF},//P  {0xFF,0xC3,0x81,0xBD,0xBD,0x80,0xC2,0xFF},//Q  {0xFF,0x80,0x80,0xB3,0xB1,0x84,0xCE,0xFF},//R  {0xFF,0xCD,0x84,0xB6,0xB6,0x90,0xD9,0xFF},//S  {0xFF,0x9F,0xBF,0x80,0x80,0xBF,0x9F,0xFF},//T  {0xFF,0x81,0x80,0xFE,0xFE,0x80,0x80,0xFF},//U  {0xFF,0x83,0x81,0xFC,0xFC,0x81,0x83,0xFF},//V  {0xFF,0x80,0x80,0xF9,0xF3,0xF9,0x80,0x80},//W  {0xFF,0x9C,0x88,0xE3,0xF7,0xE3,0x88,0x9C},//X  {0xFF,0x8F,0x87,0xF0,0xF0,0x87,0x8F,0xFF},//Y  {0xFF,0xBC,0xB8,0xB2,0xA6,0x8E,0x9E,0xFF},//Z  {0xFF,0xFE,0xEE,0x80,0x80,0xFE,0xFE,0xFF},//1  {0xFF,0xDC,0x98,0xBA,0xB6,0x86,0xCE,0xFF},//2  {0xFF,0xDD,0x9C,0xB6,0xB6,0x80,0xC9,0xFF},//3  {0xFF,0xF3,0xEB,0xDB,0x80,0x80,0xFB,0xFF},//4  {0xFF,0x8D,0x8C,0xAE,0xAE,0xA0,0xB1,0xFF},//5  {0xFF,0xC1,0x80,0xB6,0xB6,0x90,0xD9,0xFF},//6  {0xFF,0x9F,0x9F,0xB8,0xA0,0x87,0x9F,0xFF},//7  {0xFF,0xC9,0x80,0xB6,0xB6,0x80,0xC9,0xFF},//8  {0xFF,0xCD,0x84,0xB6,0xB6,0x80,0xC1,0xFF},//9  {0xFF,0xC1,0x80,0xAE,0xB6,0x80,0xC1,0xFF},//0  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},//space    };  byte cot = 0b10000000;  void setup() {  Serial.begin(9600);  pinMode(ST\_CP,OUTPUT);//RCLK    pinMode(DS\_hang,OUTPUT);//SER hang  pinMode(SH\_CP\_hang,OUTPUT);//SRCLK hang  pinMode(SH\_CP\_cot,OUTPUT);//SRCLK cot  pinMode(DS\_cot,OUTPUT);//SER cot  }  void loop() {  for(int j = 0; j<37;j++){  for(int z = 0;z<50;z++){  for(int i = 0; i < 8;i++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,chu[j][i]);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,cot >> i); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  }  }  } |

* Code file code\_test\_6

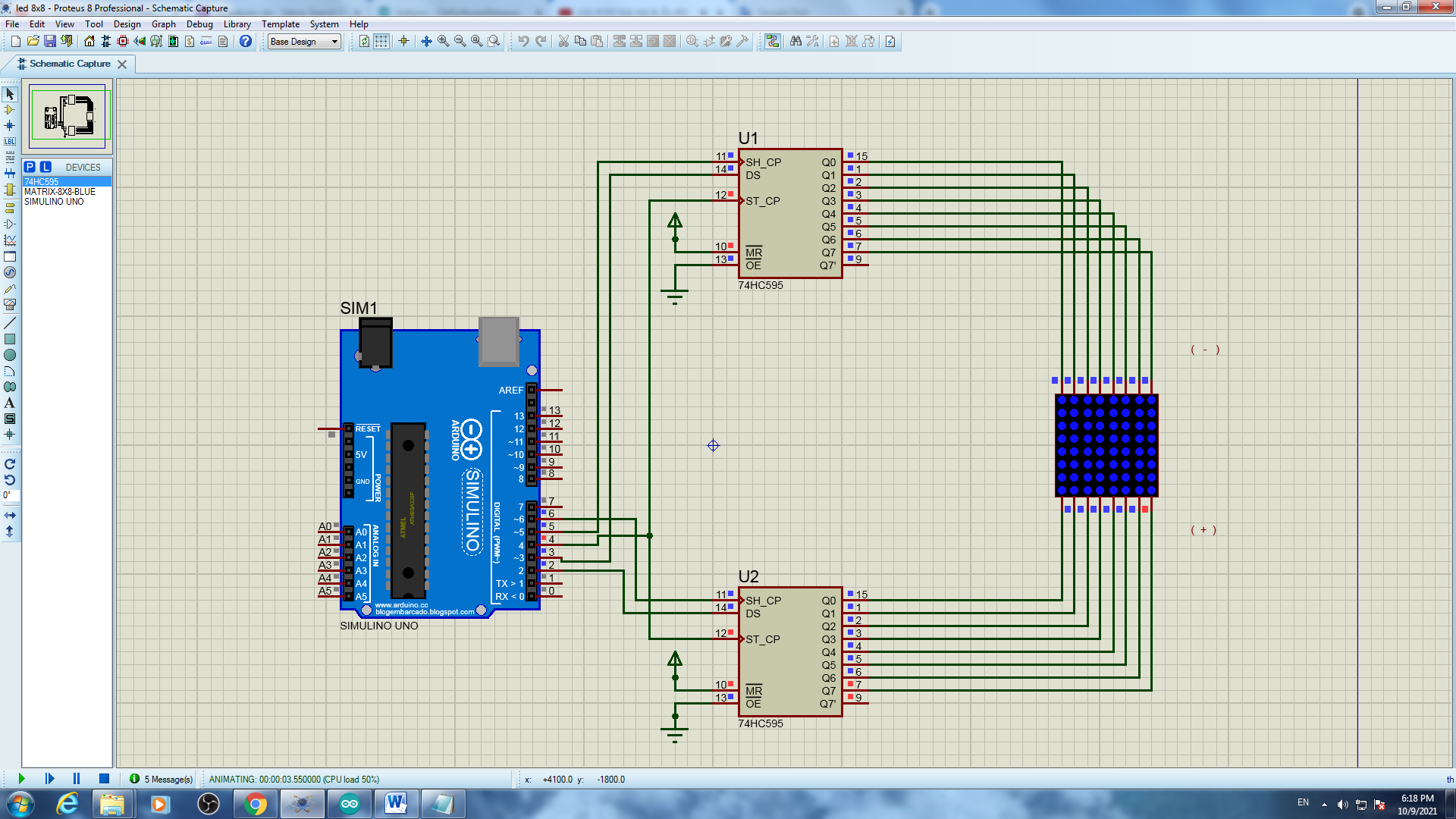
|  |
| --- |
| #define DS\_cot 2  #define DS\_hang 3  #define SH\_CP\_hang 5  #define SH\_CP\_cot 6  #define ST\_CP 4  byte chu[][8] = {  {0xFF,0xC0,0x80,0xB7,0xB7,0x80,0xC0,0xFF}, //A  {0xFF,0x80,0x80,0xB6,0xB6,0x80,0xC9,0xFF}, //B  {0xFF,0xC1,0x80,0xBE,0xBE,0x9C,0xDD,0xFF}, //C  {0xFF,0x80,0x80,0xBE,0xBE,0x80,0xC1,0xFF}, //D  {0xFF,0x80,0x80,0xB6,0xB6,0xBE,0xBE,0xFF},//E  {0xFF,0x80,0x80,0xB7,0xB7,0xBF,0xBF,0xFF},//F  {0xFF,0xC1,0x80,0xBE,0xBA,0x98,0xD9,0xFF},//G  {0xFF,0x80,0x80,0xF7,0xF7,0x80,0x80,0xFF},//H  {0xFF,0xFF,0xBE,0x80,0x80,0xBE,0xFF,0xFF},//I  {0xFF,0xF9,0xF8,0xBE,0x80,0x81,0xBF,0xFF},//J  {0xFF,0x80,0x80,0xE3,0xC9,0x9C,0xBE,0xFF},//K  {0xFF,0x80,0x80,0xFE,0xFE,0xFE,0xFE,0xFF},//L  {0xFF,0x80,0x80,0xCF,0xE7,0xCF,0x80,0x80},//M  {0xFF,0x80,0x80,0xCF,0xE7,0xF3,0x80,0x80},//N  {0xFF,0xC1,0x80,0xBE,0xBE,0x80,0xC1,0xFF},//O  {0xFF,0x80,0x80,0xBB,0xBB,0x83,0xC7,0xFF},//P  {0xFF,0xC3,0x81,0xBD,0xBD,0x80,0xC2,0xFF},//Q  {0xFF,0x80,0x80,0xB3,0xB1,0x84,0xCE,0xFF},//R  {0xFF,0xCD,0x84,0xB6,0xB6,0x90,0xD9,0xFF},//S  {0xFF,0x9F,0xBF,0x80,0x80,0xBF,0x9F,0xFF},//T  {0xFF,0x81,0x80,0xFE,0xFE,0x80,0x80,0xFF},//U  {0xFF,0x83,0x81,0xFC,0xFC,0x81,0x83,0xFF},//V  {0xFF,0x80,0x80,0xF9,0xF3,0xF9,0x80,0x80},//W  {0xFF,0x9C,0x88,0xE3,0xF7,0xE3,0x88,0x9C},//X  {0xFF,0x8F,0x87,0xF0,0xF0,0x87,0x8F,0xFF},//Y  {0xFF,0xBC,0xB8,0xB2,0xA6,0x8E,0x9E,0xFF},//Z  {0xFF,0xFE,0xEE,0x80,0x80,0xFE,0xFE,0xFF},//1  {0xFF,0xDC,0x98,0xBA,0xB6,0x86,0xCE,0xFF},//2  {0xFF,0xDD,0x9C,0xB6,0xB6,0x80,0xC9,0xFF},//3  {0xFF,0xF3,0xEB,0xDB,0x80,0x80,0xFB,0xFF},//4  {0xFF,0x8D,0x8C,0xAE,0xAE,0xA0,0xB1,0xFF},//5  {0xFF,0xC1,0x80,0xB6,0xB6,0x90,0xD9,0xFF},//6  {0xFF,0x9F,0x9F,0xB8,0xA0,0x87,0x9F,0xFF},//7  {0xFF,0xC9,0x80,0xB6,0xB6,0x80,0xC9,0xFF},//8  {0xFF,0xCD,0x84,0xB6,0xB6,0x80,0xC1,0xFF},//9  {0xFF,0xC1,0x80,0xAE,0xB6,0x80,0xC1,0xFF},//0  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},//space    };  byte cot[8]={0b10000000,0b01000000,0b00100000,0b00010000,0b00001000,0b00000100,0b00000010,0b00000001};  char character[]={'A','B','C','D','E','F','G','H','I','J','K','L','M','N','O','P','Q','R','S','T','U','V','W','X','Y','Z','1','2','3','4','5','6','7','8','9','0',' '};  //String hienthi = "HAPPY NEW YEAR";  byte led[][8] = {  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},  };  byte nho;  void setup() {  Serial.begin(9600);  pinMode(ST\_CP,OUTPUT);//RCLK    pinMode(DS\_hang,OUTPUT);//SER hang  pinMode(SH\_CP\_hang,OUTPUT);//SRCLK hang  pinMode(SH\_CP\_cot,OUTPUT);//SRCLK cot  pinMode(DS\_cot,OUTPUT);//SER cot  }  void loop() {  hienthi("HAPPY NEW YEAR",20);  }  void hienthi(String tukhoa, unsigned int tocdo){  for(int q=0;q<tukhoa.length();q++){  for(int e=0;e<sizeof(character);e++){  if(tukhoa.charAt(q)==character[e]){  for(byte h=0;h<8;h++){    for(byte j=0;j<7;j++){  led[0][j] = led[0][j+1];  }  led[0][7]=chu[e][h];  for(byte w = 0; w<tocdo;w++){  for(byte i=0;i<8;i++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[0][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[1][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[2][i]);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,cot[i]); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  }  }  for(byte j=0;j<7;j++){  led[2][j] = led[2][j+1];  }  led[2][7]=led[1][0];  for(byte j=0;j<7;j++){  led[1][j] = led[1][j+1];  }  led[1][7]=led[0][0];    }  if(q==tukhoa.length()-1){ ///// tao khoang trong  for(byte h=0;h<24;h++){  for(byte j=0;j<7;j++){  led[0][j] = led[0][j+1];  }  led[0][7]=0xFF;  for(byte w = 0; w<tocdo;w++){  for(byte i=0;i<8;i++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[0][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[1][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[2][i]);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,cot[i]); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  }  }  for(byte j=0;j<7;j++){  led[2][j] = led[2][j+1];  }  led[2][7]=led[1][0];  for(byte j=0;j<7;j++){  led[1][j] = led[1][j+1];  }  led[1][7]=led[0][0];  }  }  }  }  }  } |

* Code file code\_test\_7

|  |
| --- |
| #define DS\_cot 2  #define DS\_hang 3  #define SH\_CP\_hang 5  #define SH\_CP\_cot 6  #define ST\_CP 4  byte chu[][8] = {  {0xFF,0xC0,0x80,0xB7,0xB7,0x80,0xC0,0xFF}, //A  {0xFF,0x80,0x80,0xB6,0xB6,0x80,0xC9,0xFF}, //B  {0xFF,0xC1,0x80,0xBE,0xBE,0x9C,0xDD,0xFF}, //C  {0xFF,0x80,0x80,0xBE,0xBE,0x80,0xC1,0xFF}, //D  {0xFF,0x80,0x80,0xB6,0xB6,0xBE,0xBE,0xFF},//E  {0xFF,0x80,0x80,0xB7,0xB7,0xBF,0xBF,0xFF},//F  {0xFF,0xC1,0x80,0xBE,0xBA,0x98,0xD9,0xFF},//G  {0xFF,0x80,0x80,0xF7,0xF7,0x80,0x80,0xFF},//H  {0xFF,0xFF,0xBE,0x80,0x80,0xBE,0xFF,0xFF},//I  {0xFF,0xF9,0xF8,0xBE,0x80,0x81,0xBF,0xFF},//J  {0xFF,0x80,0x80,0xE3,0xC9,0x9C,0xBE,0xFF},//K  {0xFF,0x80,0x80,0xFE,0xFE,0xFE,0xFE,0xFF},//L  {0xFF,0x80,0x80,0xCF,0xE7,0xCF,0x80,0x80},//M  {0xFF,0x80,0x80,0xCF,0xE7,0xF3,0x80,0x80},//N  {0xFF,0xC1,0x80,0xBE,0xBE,0x80,0xC1,0xFF},//O  {0xFF,0x80,0x80,0xBB,0xBB,0x83,0xC7,0xFF},//P  {0xFF,0xC3,0x81,0xBD,0xBD,0x80,0xC2,0xFF},//Q  {0xFF,0x80,0x80,0xB3,0xB1,0x84,0xCE,0xFF},//R  {0xFF,0xCD,0x84,0xB6,0xB6,0x90,0xD9,0xFF},//S  {0xFF,0x9F,0xBF,0x80,0x80,0xBF,0x9F,0xFF},//T  {0xFF,0x81,0x80,0xFE,0xFE,0x80,0x80,0xFF},//U  {0xFF,0x83,0x81,0xFC,0xFC,0x81,0x83,0xFF},//V  {0xFF,0x80,0x80,0xF9,0xF3,0xF9,0x80,0x80},//W  {0xFF,0x9C,0x88,0xE3,0xF7,0xE3,0x88,0x9C},//X  {0xFF,0x8F,0x87,0xF0,0xF0,0x87,0x8F,0xFF},//Y  {0xFF,0xBC,0xB8,0xB2,0xA6,0x8E,0x9E,0xFF},//Z  {0xFF,0xFE,0xEE,0x80,0x80,0xFE,0xFE,0xFF},//1  {0xFF,0xDC,0x98,0xBA,0xB6,0x86,0xCE,0xFF},//2  {0xFF,0xDD,0x9C,0xB6,0xB6,0x80,0xC9,0xFF},//3  {0xFF,0xF3,0xEB,0xDB,0x80,0x80,0xFB,0xFF},//4  {0xFF,0x8D,0x8C,0xAE,0xAE,0xA0,0xB1,0xFF},//5  {0xFF,0xC1,0x80,0xB6,0xB6,0x90,0xD9,0xFF},//6  {0xFF,0x9F,0x9F,0xB8,0xA0,0x87,0x9F,0xFF},//7  {0xFF,0xC9,0x80,0xB6,0xB6,0x80,0xC9,0xFF},//8  {0xFF,0xCD,0x84,0xB6,0xB6,0x80,0xC1,0xFF},//9  {0xFF,0xC1,0x80,0xAE,0xB6,0x80,0xC1,0xFF},//0  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},//space  };  byte cot[8]={0b10000000,0b01000000,0b00100000,0b00010000,0b00001000,0b00000100,0b00000010,0b00000001};  char character[]={'A','B','C','D','E','F','G','H','I','J','K','L','M','N','O','P','Q','R','S','T','U','V','W','X','Y','Z','1','2','3','4','5','6','7','8','9','0',' '};  //String hienthi = "HAPPY NEW YEAR";  byte led[][8] = {  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},  };  byte nho;  void setup() {  Serial.begin(9600);  pinMode(ST\_CP,OUTPUT);//RCLK    pinMode(DS\_hang,OUTPUT);//SER hang  pinMode(SH\_CP\_hang,OUTPUT);//SRCLK hang  pinMode(SH\_CP\_cot,OUTPUT);//SRCLK cot  pinMode(DS\_cot,OUTPUT);//SER cot  }  void loop() {  hienthi("CAO THAI TOAN PHONG MSSV 60136530 ",20);  }  void hienthi(String tukhoa, unsigned int tocdo){  for(int q=0;q<tukhoa.length();q++){  for(int e=0;e<sizeof(character);e++){  if(tukhoa.charAt(q)==character[e]){  for(byte h=0;h<8;h++){    for(byte j=0;j<7;j++){  led[0][j] = led[0][j+1];  }  led[0][7]=chu[e][h];  for(byte w = 0; w<tocdo;w++){  for(byte i=0;i<8;i++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[0][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[1][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[2][i]);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,cot[i]); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  }  }  for(byte j=0;j<7;j++){  led[2][j] = led[2][j+1];  }  led[2][7]=led[1][0];  for(byte j=0;j<7;j++){  led[1][j] = led[1][j+1];  }  led[1][7]=led[0][0];  }  if(q==tukhoa.length()-1){ ///// tao khoang trong  for(byte h=0;h<24;h++){  for(byte j=0;j<7;j++){  led[0][j] = led[0][j+1];  }  led[0][7]=0xFF;  for(byte w = 0; w<tocdo;w++){  for(byte i=0;i<8;i++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[0][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[1][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[2][i]);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,cot[i]); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  }  }  for(byte j=0;j<7;j++){  led[2][j] = led[2][j+1];  }  led[2][7]=led[1][0];  for(byte j=0;j<7;j++){  led[1][j] = led[1][j+1];  }  led[1][7]=led[0][0];  }  }  }  }  }  } |

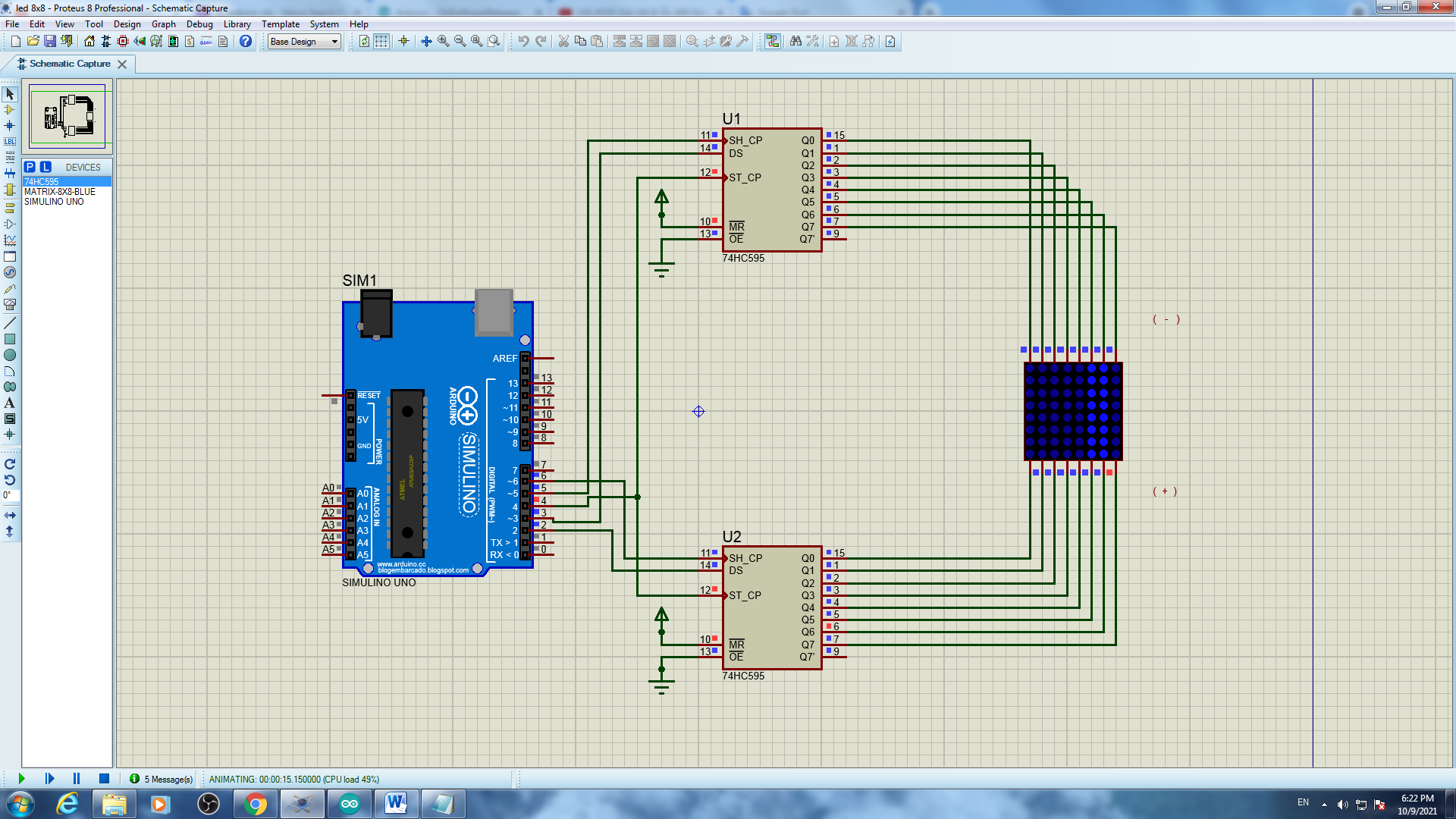
## Kết quả chạy chương trình

* Kết quả file Test 1



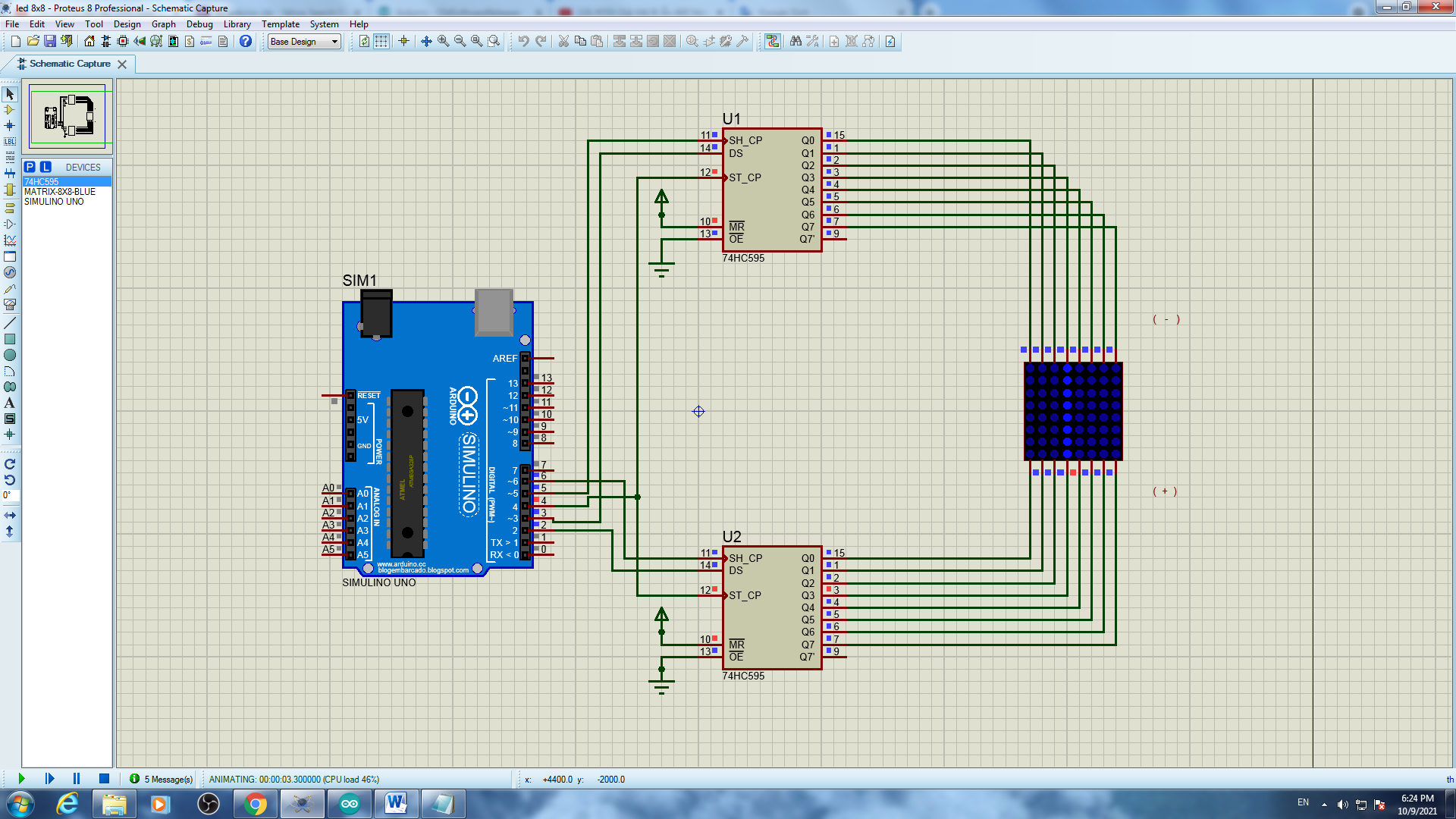
KQ test\_

* Kết quả file Test 2



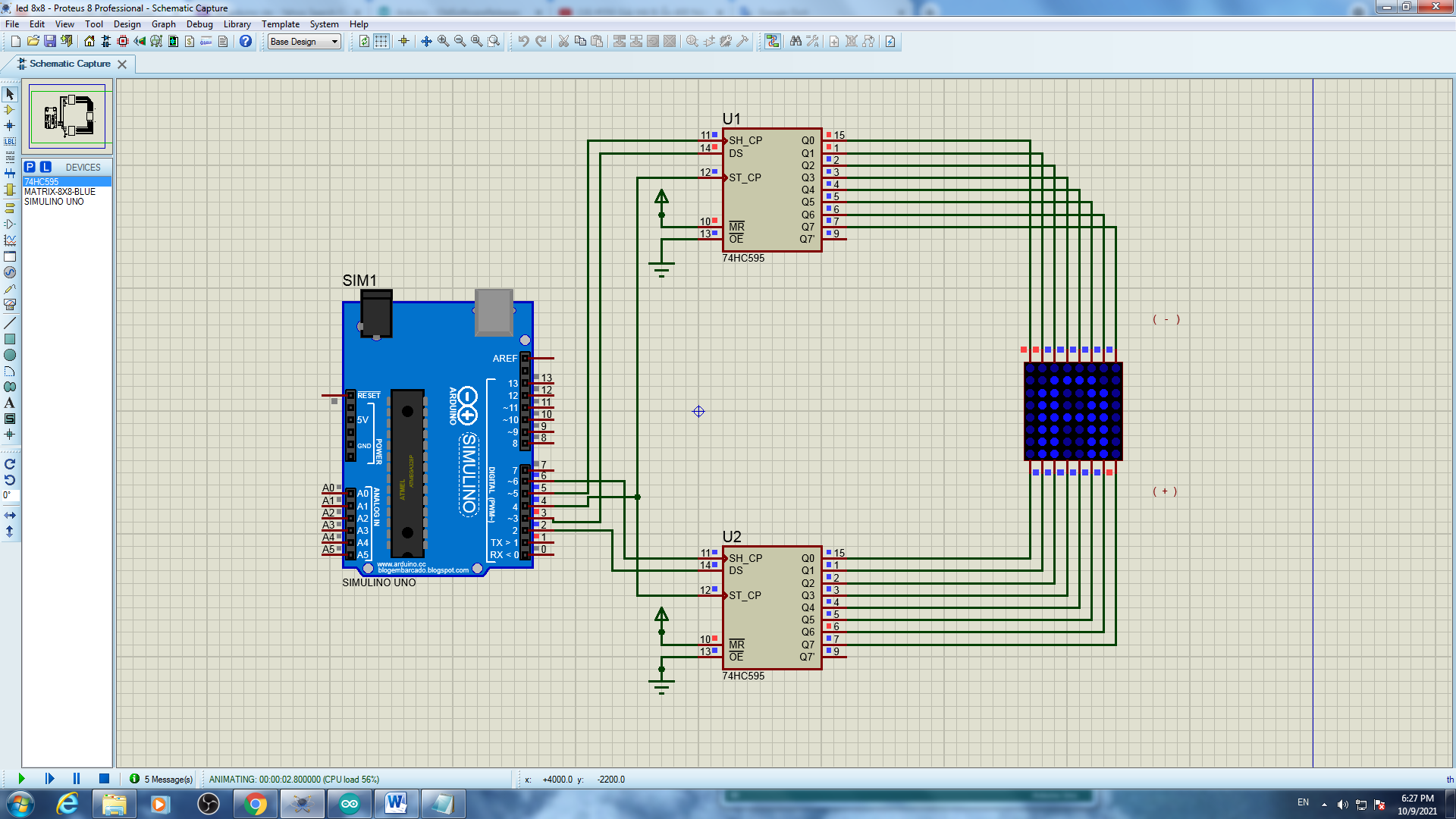
KQ test\_

* Kết quả file Test 3



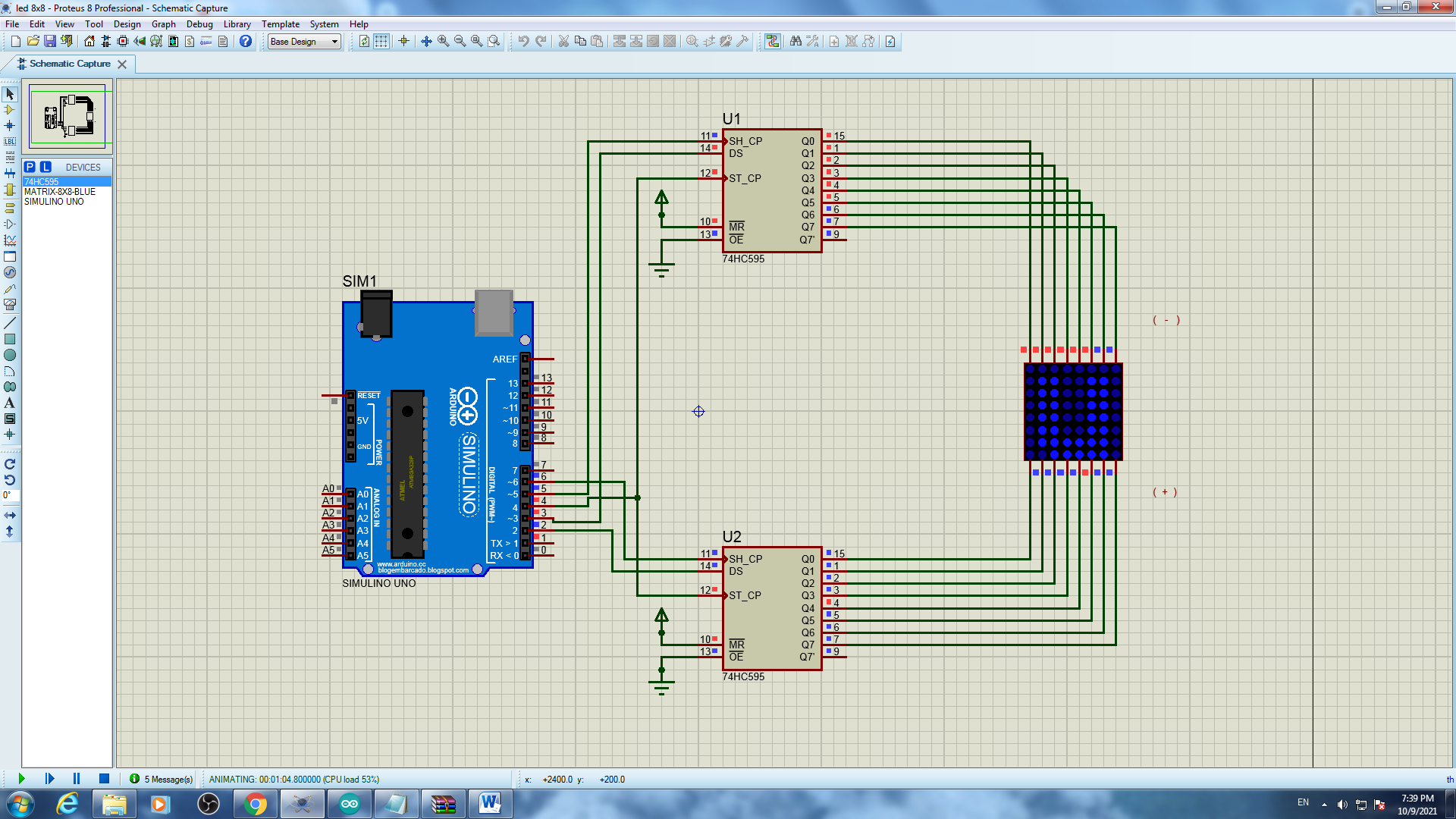
KQ test\_

* Kết quả file Test 4



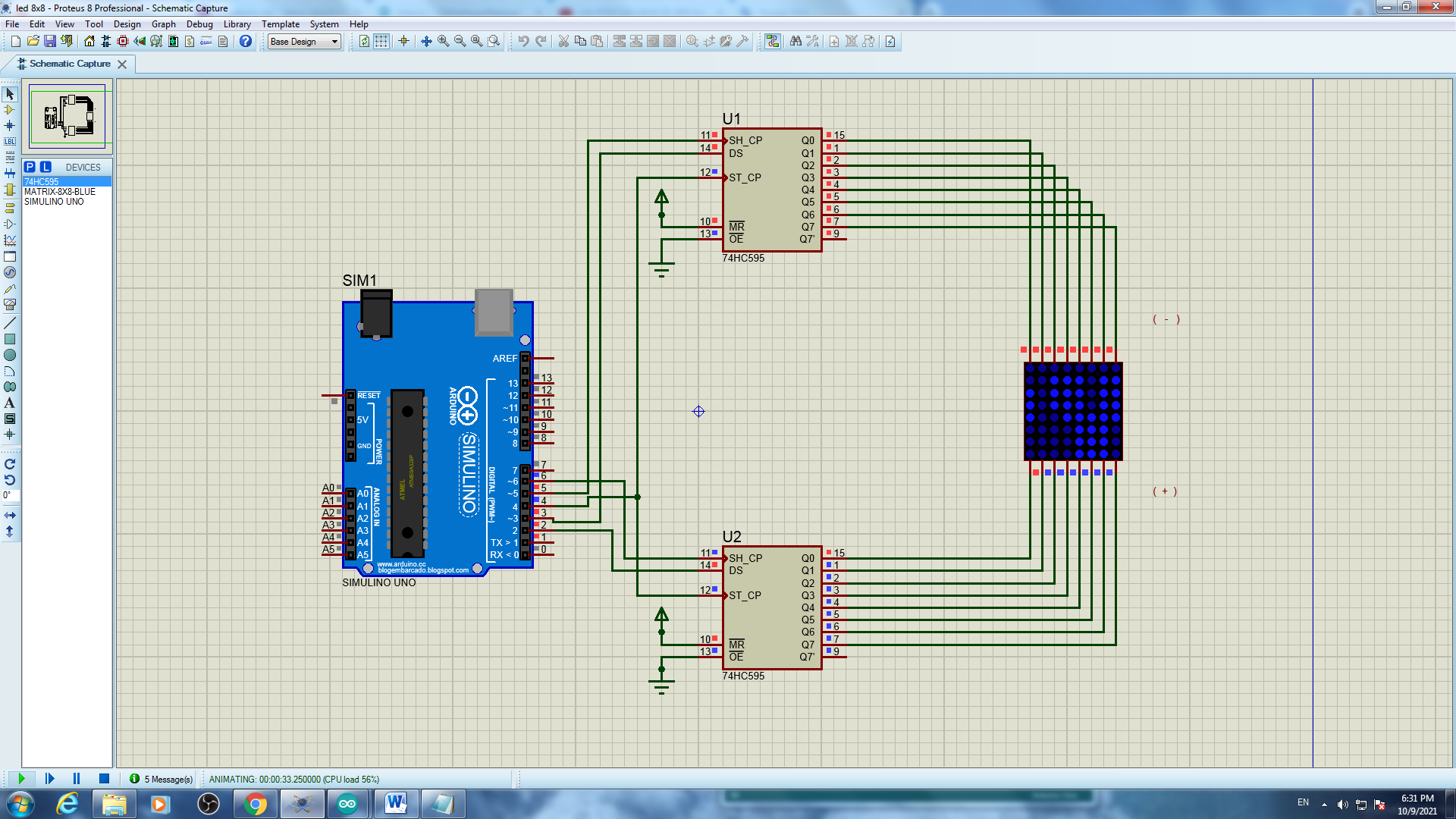
KQ test\_

* Kết quả file Test 5



KQ test\_

* Kết quả file Test 6



KQ test\_

* Kết quả file Test 7



KQ test\_

# Bài 9 : LED MATRIX 24x8

## Mô tả

Bài này thực hiện việc lập trình 1 dãy đèn LED ma trận 24x8 màu xanh dương kèm 4 IC 78HC595 hiển thị các số và chữ theo lập trình ở các file

file test\_1 : Hiển thị chữ A trong dãy đèn chạy từ trái sang phải và đổi chiều

file test\_2 : Hiển thị dòng chữ chứa từ happy new year , dòng chữ chạy từ trái sáng phải

file test\_3 : Chạy tất cả chữ từ a đến z và từ 0 đến 9 trong dãy đèn

file test\_4 : Hiển thị dòng chữ chứa tên sinh viên kèm mã số sinh viên, dòng chữ chạy từ trái sáng phải

## Linh kiện

#### 4 IC 78HC595

#### 1 bảng đèn LED ma trận 8x8 màu xanh dương

#### Mạch Arduino

## Code chương trình

* Code file test\_1:

|  |
| --- |
| #define DS\_cot 2  #define DS\_hang 3  #define SH\_CP\_hang 5  #define SH\_CP\_cot 6  #define ST\_CP 4  byte chu[][8] = {  {0xFF,0xC0,0x80,0xB7,0xB7,0x80,0xC0,0xFF}, //A  {0xFF,0x80,0x80,0xB6,0xB6,0x80,0xC9,0xFF}, //B  {0xFF,0xC1,0x80,0xBE,0xBE,0x9C,0xDD,0xFF}, //C  {0xFF,0x80,0x80,0xBE,0xBE,0x80,0xC1,0xFF}, //D  {0xFF,0x80,0x80,0xB6,0xB6,0xBE,0xBE,0xFF},//E  {0xFF,0x80,0x80,0xB7,0xB7,0xBF,0xBF,0xFF},//F  {0xFF,0xC1,0x80,0xBE,0xBA,0x98,0xD9,0xFF},//G  {0xFF,0x80,0x80,0xF7,0xF7,0x80,0x80,0xFF},//H  {0xFF,0xFF,0xBE,0x80,0x80,0xBE,0xFF,0xFF},//I  {0xFF,0xF9,0xF8,0xBE,0x80,0x81,0xBF,0xFF},//J  {0xFF,0x80,0x80,0xE3,0xC9,0x9C,0xBE,0xFF},//K  {0xFF,0x80,0x80,0xFE,0xFE,0xFE,0xFE,0xFF},//L  {0xFF,0x80,0x80,0xCF,0xE7,0xCF,0x80,0x80},//M  {0xFF,0x80,0x80,0xCF,0xE7,0xF3,0x80,0x80},//N  {0xFF,0xC1,0x80,0xBE,0xBE,0x80,0xC1,0xFF},//O  {0xFF,0x80,0x80,0xBB,0xBB,0x83,0xC7,0xFF},//P  {0xFF,0xC3,0x81,0xBD,0xBD,0x80,0xC2,0xFF},//Q  {0xFF,0x80,0x80,0xB3,0xB1,0x84,0xCE,0xFF},//R  {0xFF,0xCD,0x84,0xB6,0xB6,0x90,0xD9,0xFF},//S  {0xFF,0x9F,0xBF,0x80,0x80,0xBF,0x9F,0xFF},//T  {0xFF,0x81,0x80,0xFE,0xFE,0x80,0x80,0xFF},//U  {0xFF,0x83,0x81,0xFC,0xFC,0x81,0x83,0xFF},//V  {0xFF,0x80,0x80,0xF9,0xF3,0xF9,0x80,0x80},//W  {0xFF,0x9C,0x88,0xE3,0xF7,0xE3,0x88,0x9C},//X  {0xFF,0x8F,0x87,0xF0,0xF0,0x87,0x8F,0xFF},//Y  {0xFF,0xBC,0xB8,0xB2,0xA6,0x8E,0x9E,0xFF},//Z  {0xFF,0xFE,0xEE,0x80,0x80,0xFE,0xFE,0xFF},//1  {0xFF,0xDC,0x98,0xBA,0xB6,0x86,0xCE,0xFF},//2  {0xFF,0xDD,0x9C,0xB6,0xB6,0x80,0xC9,0xFF},//3  {0xFF,0xF3,0xEB,0xDB,0x80,0x80,0xFB,0xFF},//4  {0xFF,0x8D,0x8C,0xAE,0xAE,0xA0,0xB1,0xFF},//5  {0xFF,0xC1,0x80,0xB6,0xB6,0x90,0xD9,0xFF},//6  {0xFF,0x9F,0x9F,0xB8,0xA0,0x87,0x9F,0xFF},//7  {0xFF,0xC9,0x80,0xB6,0xB6,0x80,0xC9,0xFF},//8  {0xFF,0xCD,0x84,0xB6,0xB6,0x80,0xC1,0xFF},//9  {0xFF,0xC1,0x80,0xAE,0xB6,0x80,0xC1,0xFF},//0  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},//space    };  byte cot = 0b10000000;  void setup() {  Serial.begin(9600);  pinMode(ST\_CP,OUTPUT);//RCLK    pinMode(DS\_hang,OUTPUT);//SER hang  pinMode(SH\_CP\_hang,OUTPUT);//SRCLK hang  pinMode(SH\_CP\_cot,OUTPUT);//SRCLK cot  pinMode(DS\_cot,OUTPUT);//SER cot  }  void loop() {  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////////////////////////////////////////////////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////////////////////////////////////////////////////////////////////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  //////////////////////////////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////////////////////////////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  //////////////////////////////////////    for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////////////////////////////////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  ////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  ////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0b11111111);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xB7);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0x80);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xC0);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  /////  for(int j = 0;j<10;j++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b10000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b01000000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00100000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00010000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00001000); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);    digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000100); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000010); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,0xFF);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,0b00000001); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  } |

* Code file test\_2

|  |
| --- |
| #define DS\_cot 2  #define DS\_hang 3  #define SH\_CP\_hang 5  #define SH\_CP\_cot 6  #define ST\_CP 4  byte chu[][8] = {  {0xFF,0xC0,0x80,0xB7,0xB7,0x80,0xC0,0xFF}, //A  {0xFF,0x80,0x80,0xB6,0xB6,0x80,0xC9,0xFF}, //B  {0xFF,0xC1,0x80,0xBE,0xBE,0x9C,0xDD,0xFF}, //C  {0xFF,0x80,0x80,0xBE,0xBE,0x80,0xC1,0xFF}, //D  {0xFF,0x80,0x80,0xB6,0xB6,0xBE,0xBE,0xFF},//E  {0xFF,0x80,0x80,0xB7,0xB7,0xBF,0xBF,0xFF},//F  {0xFF,0xC1,0x80,0xBE,0xBA,0x98,0xD9,0xFF},//G  {0xFF,0x80,0x80,0xF7,0xF7,0x80,0x80,0xFF},//H  {0xFF,0xFF,0xBE,0x80,0x80,0xBE,0xFF,0xFF},//I  {0xFF,0xF9,0xF8,0xBE,0x80,0x81,0xBF,0xFF},//J  {0xFF,0x80,0x80,0xE3,0xC9,0x9C,0xBE,0xFF},//K  {0xFF,0x80,0x80,0xFE,0xFE,0xFE,0xFE,0xFF},//L  {0xFF,0x80,0x80,0xCF,0xE7,0xCF,0x80,0x80},//M  {0xFF,0x80,0x80,0xCF,0xE7,0xF3,0x80,0x80},//N  {0xFF,0xC1,0x80,0xBE,0xBE,0x80,0xC1,0xFF},//O  {0xFF,0x80,0x80,0xBB,0xBB,0x83,0xC7,0xFF},//P  {0xFF,0xC3,0x81,0xBD,0xBD,0x80,0xC2,0xFF},//Q  {0xFF,0x80,0x80,0xB3,0xB1,0x84,0xCE,0xFF},//R  {0xFF,0xCD,0x84,0xB6,0xB6,0x90,0xD9,0xFF},//S  {0xFF,0x9F,0xBF,0x80,0x80,0xBF,0x9F,0xFF},//T  {0xFF,0x81,0x80,0xFE,0xFE,0x80,0x80,0xFF},//U  {0xFF,0x83,0x81,0xFC,0xFC,0x81,0x83,0xFF},//V  {0xFF,0x80,0x80,0xF9,0xF3,0xF9,0x80,0x80},//W  {0xFF,0x9C,0x88,0xE3,0xF7,0xE3,0x88,0x9C},//X  {0xFF,0x8F,0x87,0xF0,0xF0,0x87,0x8F,0xFF},//Y  {0xFF,0xBC,0xB8,0xB2,0xA6,0x8E,0x9E,0xFF},//Z  {0xFF,0xFE,0xEE,0x80,0x80,0xFE,0xFE,0xFF},//1  {0xFF,0xDC,0x98,0xBA,0xB6,0x86,0xCE,0xFF},//2  {0xFF,0xDD,0x9C,0xB6,0xB6,0x80,0xC9,0xFF},//3  {0xFF,0xF3,0xEB,0xDB,0x80,0x80,0xFB,0xFF},//4  {0xFF,0x8D,0x8C,0xAE,0xAE,0xA0,0xB1,0xFF},//5  {0xFF,0xC1,0x80,0xB6,0xB6,0x90,0xD9,0xFF},//6  {0xFF,0x9F,0x9F,0xB8,0xA0,0x87,0x9F,0xFF},//7  {0xFF,0xC9,0x80,0xB6,0xB6,0x80,0xC9,0xFF},//8  {0xFF,0xCD,0x84,0xB6,0xB6,0x80,0xC1,0xFF},//9  {0xFF,0xC1,0x80,0xAE,0xB6,0x80,0xC1,0xFF},//0  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},//space    };  byte cot[8]={0b10000000,0b01000000,0b00100000,0b00010000,0b00001000,0b00000100,0b00000010,0b00000001};  char character[]={'A','B','C','D','E','F','G','H','I','J','K','L','M','N','O','P','Q','R','S','T','U','V','W','X','Y','Z','1','2','3','4','5','6','7','8','9','0',' '};  //String hienthi = "HAPPY NEW YEAR";  byte led[][8] = {  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},  };  byte nho;  void setup() {  Serial.begin(9600);  pinMode(ST\_CP,OUTPUT);//RCLK    pinMode(DS\_hang,OUTPUT);//SER hang  pinMode(SH\_CP\_hang,OUTPUT);//SRCLK hang  pinMode(SH\_CP\_cot,OUTPUT);//SRCLK cot  pinMode(DS\_cot,OUTPUT);//SER cot  }  void loop() {  hienthi("HAPPY NEW YEAR",20);  }  void hienthi(String tukhoa, unsigned int tocdo){  for(int q=0;q<tukhoa.length();q++){  for(int e=0;e<sizeof(character);e++){  if(tukhoa.charAt(q)==character[e]){  for(byte h=0;h<8;h++){    for(byte j=0;j<7;j++){  led[0][j] = led[0][j+1];  }  led[0][7]=chu[e][h];  for(byte w = 0; w<tocdo;w++){  for(byte i=0;i<8;i++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[0][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[1][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[2][i]);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,cot[i]); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  }  }  for(byte j=0;j<7;j++){  led[2][j] = led[2][j+1];  }  led[2][7]=led[1][0];  for(byte j=0;j<7;j++){  led[1][j] = led[1][j+1];  }  led[1][7]=led[0][0];    }  if(q==tukhoa.length()-1){ ///// tao khoang trong  for(byte h=0;h<24;h++){  for(byte j=0;j<7;j++){  led[0][j] = led[0][j+1];  }  led[0][7]=0xFF;  for(byte w = 0; w<tocdo;w++){  for(byte i=0;i<8;i++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[0][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[1][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[2][i]);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,cot[i]); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  }  }  for(byte j=0;j<7;j++){  led[2][j] = led[2][j+1];  }  led[2][7]=led[1][0];  for(byte j=0;j<7;j++){  led[1][j] = led[1][j+1];  }  led[1][7]=led[0][0];  }  }  }  }  }  } |

* Code file test\_3

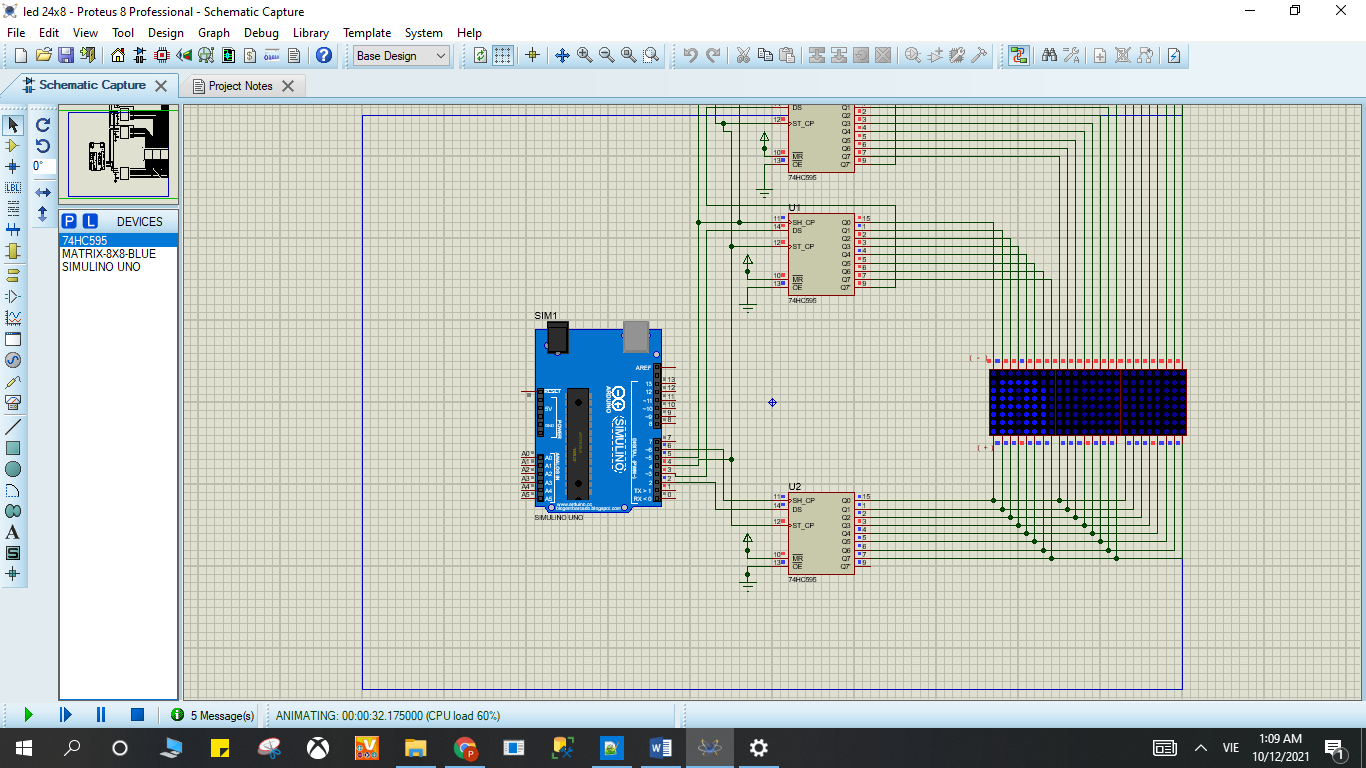
|  |
| --- |
| #define DS\_cot 2  #define DS\_hang 3  #define SH\_CP\_hang 5  #define SH\_CP\_cot 6  #define ST\_CP 4  byte chu[][8] = {  {0xFF,0xC0,0x80,0xB7,0xB7,0x80,0xC0,0xFF}, //A  {0xFF,0x80,0x80,0xB6,0xB6,0x80,0xC9,0xFF}, //B  {0xFF,0xC1,0x80,0xBE,0xBE,0x9C,0xDD,0xFF}, //C  {0xFF,0x80,0x80,0xBE,0xBE,0x80,0xC1,0xFF}, //D  {0xFF,0x80,0x80,0xB6,0xB6,0xBE,0xBE,0xFF},//E  {0xFF,0x80,0x80,0xB7,0xB7,0xBF,0xBF,0xFF},//F  {0xFF,0xC1,0x80,0xBE,0xBA,0x98,0xD9,0xFF},//G  {0xFF,0x80,0x80,0xF7,0xF7,0x80,0x80,0xFF},//H  {0xFF,0xFF,0xBE,0x80,0x80,0xBE,0xFF,0xFF},//I  {0xFF,0xF9,0xF8,0xBE,0x80,0x81,0xBF,0xFF},//J  {0xFF,0x80,0x80,0xE3,0xC9,0x9C,0xBE,0xFF},//K  {0xFF,0x80,0x80,0xFE,0xFE,0xFE,0xFE,0xFF},//L  {0xFF,0x80,0x80,0xCF,0xE7,0xCF,0x80,0x80},//M  {0xFF,0x80,0x80,0xCF,0xE7,0xF3,0x80,0x80},//N  {0xFF,0xC1,0x80,0xBE,0xBE,0x80,0xC1,0xFF},//O  {0xFF,0x80,0x80,0xBB,0xBB,0x83,0xC7,0xFF},//P  {0xFF,0xC3,0x81,0xBD,0xBD,0x80,0xC2,0xFF},//Q  {0xFF,0x80,0x80,0xB3,0xB1,0x84,0xCE,0xFF},//R  {0xFF,0xCD,0x84,0xB6,0xB6,0x90,0xD9,0xFF},//S  {0xFF,0x9F,0xBF,0x80,0x80,0xBF,0x9F,0xFF},//T  {0xFF,0x81,0x80,0xFE,0xFE,0x80,0x80,0xFF},//U  {0xFF,0x83,0x81,0xFC,0xFC,0x81,0x83,0xFF},//V  {0xFF,0x80,0x80,0xF9,0xF3,0xF9,0x80,0x80},//W  {0xFF,0x9C,0x88,0xE3,0xF7,0xE3,0x88,0x9C},//X  {0xFF,0x8F,0x87,0xF0,0xF0,0x87,0x8F,0xFF},//Y  {0xFF,0xBC,0xB8,0xB2,0xA6,0x8E,0x9E,0xFF},//Z  {0xFF,0xFE,0xEE,0x80,0x80,0xFE,0xFE,0xFF},//1  {0xFF,0xDC,0x98,0xBA,0xB6,0x86,0xCE,0xFF},//2  {0xFF,0xDD,0x9C,0xB6,0xB6,0x80,0xC9,0xFF},//3  {0xFF,0xF3,0xEB,0xDB,0x80,0x80,0xFB,0xFF},//4  {0xFF,0x8D,0x8C,0xAE,0xAE,0xA0,0xB1,0xFF},//5  {0xFF,0xC1,0x80,0xB6,0xB6,0x90,0xD9,0xFF},//6  {0xFF,0x9F,0x9F,0xB8,0xA0,0x87,0x9F,0xFF},//7  {0xFF,0xC9,0x80,0xB6,0xB6,0x80,0xC9,0xFF},//8  {0xFF,0xCD,0x84,0xB6,0xB6,0x80,0xC1,0xFF},//9  {0xFF,0xC1,0x80,0xAE,0xB6,0x80,0xC1,0xFF},//0  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},//space    };  byte cot = 0b10000000;  void setup() {  Serial.begin(9600);  pinMode(ST\_CP,OUTPUT);//RCLK    pinMode(DS\_hang,OUTPUT);//SER hang  pinMode(SH\_CP\_hang,OUTPUT);//SRCLK hang  pinMode(SH\_CP\_cot,OUTPUT);//SRCLK cot  pinMode(DS\_cot,OUTPUT);//SER cot  }  void loop() {  for(int j = 0; j<37;j++){  for(int z = 0;z<50;z++){  for(int i = 0; i < 8;i++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,chu[j][i]);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,cot >> i); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  delay(1);  }  }  }  } |

Code file test\_4

|  |
| --- |
| #define DS\_cot 2  #define DS\_hang 3  #define SH\_CP\_hang 5  #define SH\_CP\_cot 6  #define ST\_CP 4  byte chu[][8] = {  {0xFF,0xC0,0x80,0xB7,0xB7,0x80,0xC0,0xFF}, //A  {0xFF,0x80,0x80,0xB6,0xB6,0x80,0xC9,0xFF}, //B  {0xFF,0xC1,0x80,0xBE,0xBE,0x9C,0xDD,0xFF}, //C  {0xFF,0x80,0x80,0xBE,0xBE,0x80,0xC1,0xFF}, //D  {0xFF,0x80,0x80,0xB6,0xB6,0xBE,0xBE,0xFF},//E  {0xFF,0x80,0x80,0xB7,0xB7,0xBF,0xBF,0xFF},//F  {0xFF,0xC1,0x80,0xBE,0xBA,0x98,0xD9,0xFF},//G  {0xFF,0x80,0x80,0xF7,0xF7,0x80,0x80,0xFF},//H  {0xFF,0xFF,0xBE,0x80,0x80,0xBE,0xFF,0xFF},//I  {0xFF,0xF9,0xF8,0xBE,0x80,0x81,0xBF,0xFF},//J  {0xFF,0x80,0x80,0xE3,0xC9,0x9C,0xBE,0xFF},//K  {0xFF,0x80,0x80,0xFE,0xFE,0xFE,0xFE,0xFF},//L  {0xFF,0x80,0x80,0xCF,0xE7,0xCF,0x80,0x80},//M  {0xFF,0x80,0x80,0xCF,0xE7,0xF3,0x80,0x80},//N  {0xFF,0xC1,0x80,0xBE,0xBE,0x80,0xC1,0xFF},//O  {0xFF,0x80,0x80,0xBB,0xBB,0x83,0xC7,0xFF},//P  {0xFF,0xC3,0x81,0xBD,0xBD,0x80,0xC2,0xFF},//Q  {0xFF,0x80,0x80,0xB3,0xB1,0x84,0xCE,0xFF},//R  {0xFF,0xCD,0x84,0xB6,0xB6,0x90,0xD9,0xFF},//S  {0xFF,0x9F,0xBF,0x80,0x80,0xBF,0x9F,0xFF},//T  {0xFF,0x81,0x80,0xFE,0xFE,0x80,0x80,0xFF},//U  {0xFF,0x83,0x81,0xFC,0xFC,0x81,0x83,0xFF},//V  {0xFF,0x80,0x80,0xF9,0xF3,0xF9,0x80,0x80},//W  {0xFF,0x9C,0x88,0xE3,0xF7,0xE3,0x88,0x9C},//X  {0xFF,0x8F,0x87,0xF0,0xF0,0x87,0x8F,0xFF},//Y  {0xFF,0xBC,0xB8,0xB2,0xA6,0x8E,0x9E,0xFF},//Z  {0xFF,0xFE,0xEE,0x80,0x80,0xFE,0xFE,0xFF},//1  {0xFF,0xDC,0x98,0xBA,0xB6,0x86,0xCE,0xFF},//2  {0xFF,0xDD,0x9C,0xB6,0xB6,0x80,0xC9,0xFF},//3  {0xFF,0xF3,0xEB,0xDB,0x80,0x80,0xFB,0xFF},//4  {0xFF,0x8D,0x8C,0xAE,0xAE,0xA0,0xB1,0xFF},//5  {0xFF,0xC1,0x80,0xB6,0xB6,0x90,0xD9,0xFF},//6  {0xFF,0x9F,0x9F,0xB8,0xA0,0x87,0x9F,0xFF},//7  {0xFF,0xC9,0x80,0xB6,0xB6,0x80,0xC9,0xFF},//8  {0xFF,0xCD,0x84,0xB6,0xB6,0x80,0xC1,0xFF},//9  {0xFF,0xC1,0x80,0xAE,0xB6,0x80,0xC1,0xFF},//0  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},//space    };  byte cot[8]={0b10000000,0b01000000,0b00100000,0b00010000,0b00001000,0b00000100,0b00000010,0b00000001};  char character[]={'A','B','C','D','E','F','G','H','I','J','K','L','M','N','O','P','Q','R','S','T','U','V','W','X','Y','Z','1','2','3','4','5','6','7','8','9','0',' '};  //String hienthi = "HAPPY NEW YEAR";  byte led[][8] = {  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},  {0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF,0xFF},  };  byte nho;  void setup() {  Serial.begin(9600);  pinMode(ST\_CP,OUTPUT);//RCLK    pinMode(DS\_hang,OUTPUT);//SER hang  pinMode(SH\_CP\_hang,OUTPUT);//SRCLK hang  pinMode(SH\_CP\_cot,OUTPUT);//SRCLK cot  pinMode(DS\_cot,OUTPUT);//SER cot  }  void loop() {  hienthi("CAO THAI TOAN PHONG MSSV 60136530 ",20);  }  void hienthi(String tukhoa, unsigned int tocdo){  for(int q=0;q<tukhoa.length();q++){  for(int e=0;e<sizeof(character);e++){  if(tukhoa.charAt(q)==character[e]){  for(byte h=0;h<8;h++){    for(byte j=0;j<7;j++){  led[0][j] = led[0][j+1];  }  led[0][7]=chu[e][h];  for(byte w = 0; w<tocdo;w++){  for(byte i=0;i<8;i++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[0][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[1][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[2][i]);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,cot[i]); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  }  }  for(byte j=0;j<7;j++){  led[2][j] = led[2][j+1];  }  led[2][7]=led[1][0];  for(byte j=0;j<7;j++){  led[1][j] = led[1][j+1];  }  led[1][7]=led[0][0];    }  if(q==tukhoa.length()-1){ ///// tao khoang trong  for(byte h=0;h<24;h++){  for(byte j=0;j<7;j++){  led[0][j] = led[0][j+1];  }  led[0][7]=0xFF;  for(byte w = 0; w<tocdo;w++){  for(byte i=0;i<8;i++){  digitalWrite(ST\_CP,LOW);  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[0][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[1][i]);// hang 8 - hang 1  shiftOut(DS\_hang,SH\_CP\_hang,LSBFIRST,led[2][i]);// hang 8 - hang 1  shiftOut(DS\_cot,SH\_CP\_cot,LSBFIRST,cot[i]); // cot 8 - cot 1  digitalWrite(ST\_CP,HIGH);  }  }  for(byte j=0;j<7;j++){  led[2][j] = led[2][j+1];  }  led[2][7]=led[1][0];  for(byte j=0;j<7;j++){  led[1][j] = led[1][j+1];  }  led[1][7]=led[0][0];  }  }  }  }  }  } |

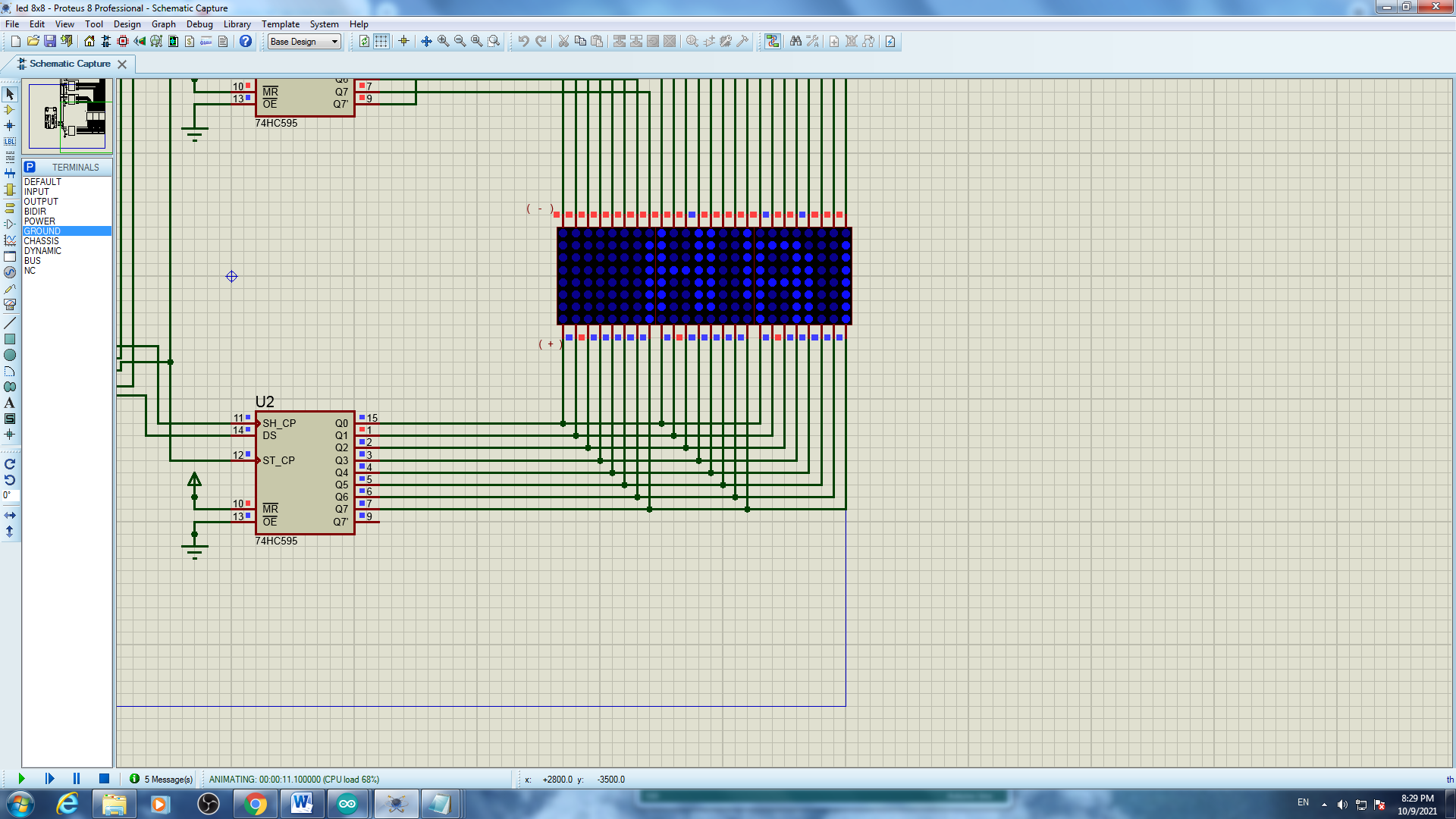
## Kết quả chạy chương trình

* Kết quả file Test 1



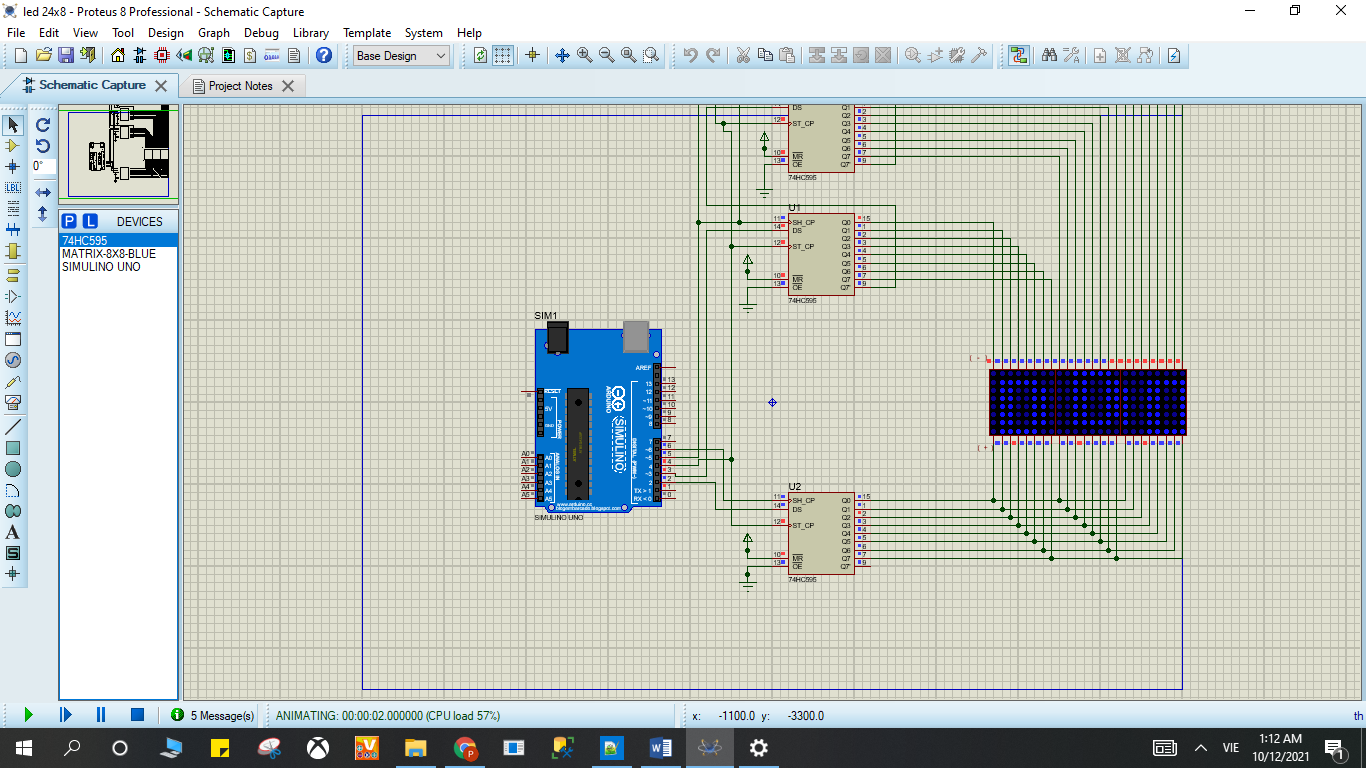
LED 24x8 KQ test

* Kết quả file Test 2



LED 24x8 KQ test

* Kết quả file Test 3



LED 24x8 KQ test

* Kết quả file Test 4



LED 24x8 KQ test

# Bài 10. 8 LED

## Mô tả

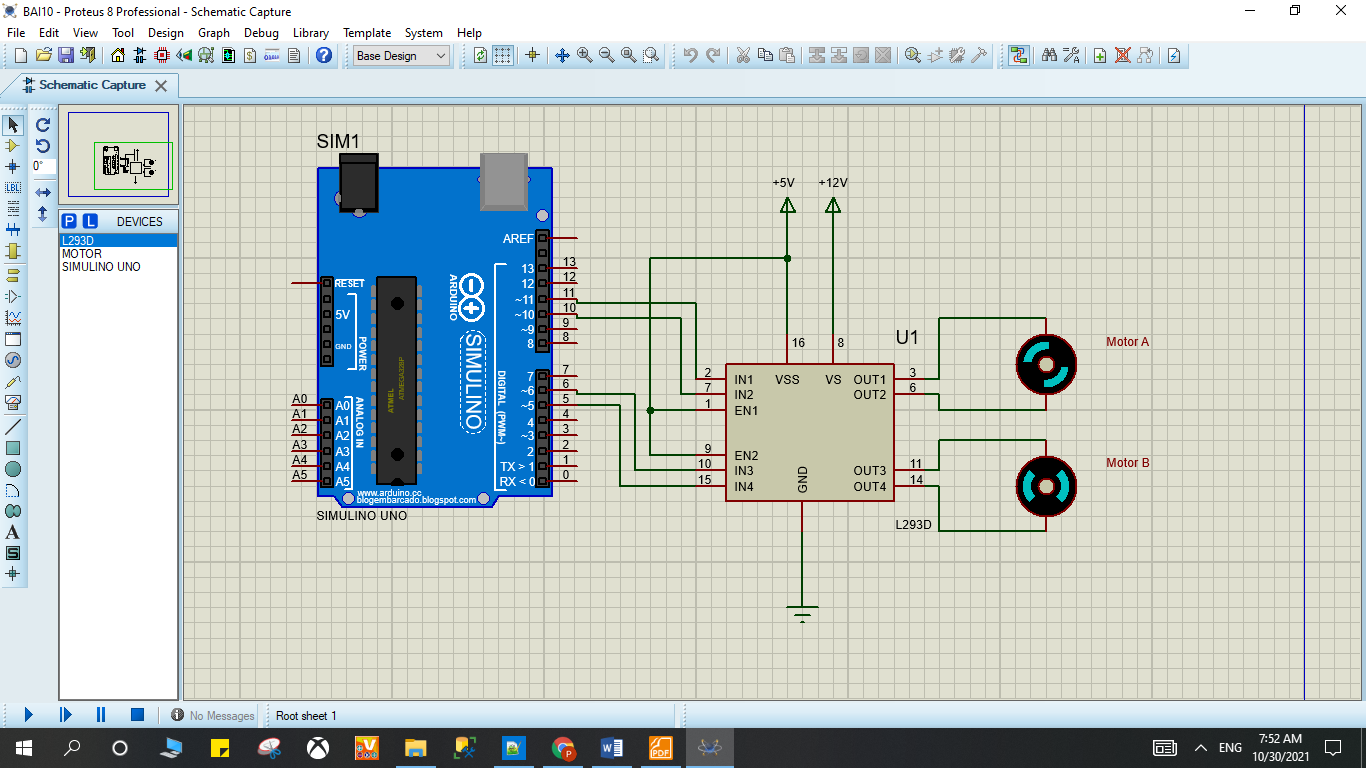
## Bài này thực hiện điều khiển 2 motor A và B quay từ trái sang phải rồi đổi chiều ngược lại

## điều chỉnh 2 motor chạy ở mức độ tối đa 255

## hoãn 1 giây, sau đó

## điều chỉnh motor A chạy tốc độ từ 0 đến maximum rồi châm dần lại về 0 hoãn 1 giây sau đó tiếp tục vòng lặp

## Sơ đồ mạch và kết quả chạy chương trình



Sơ đồ kết nối của hệ thống 9

## Linh kiện

#### 1 mạch Arduino Uno

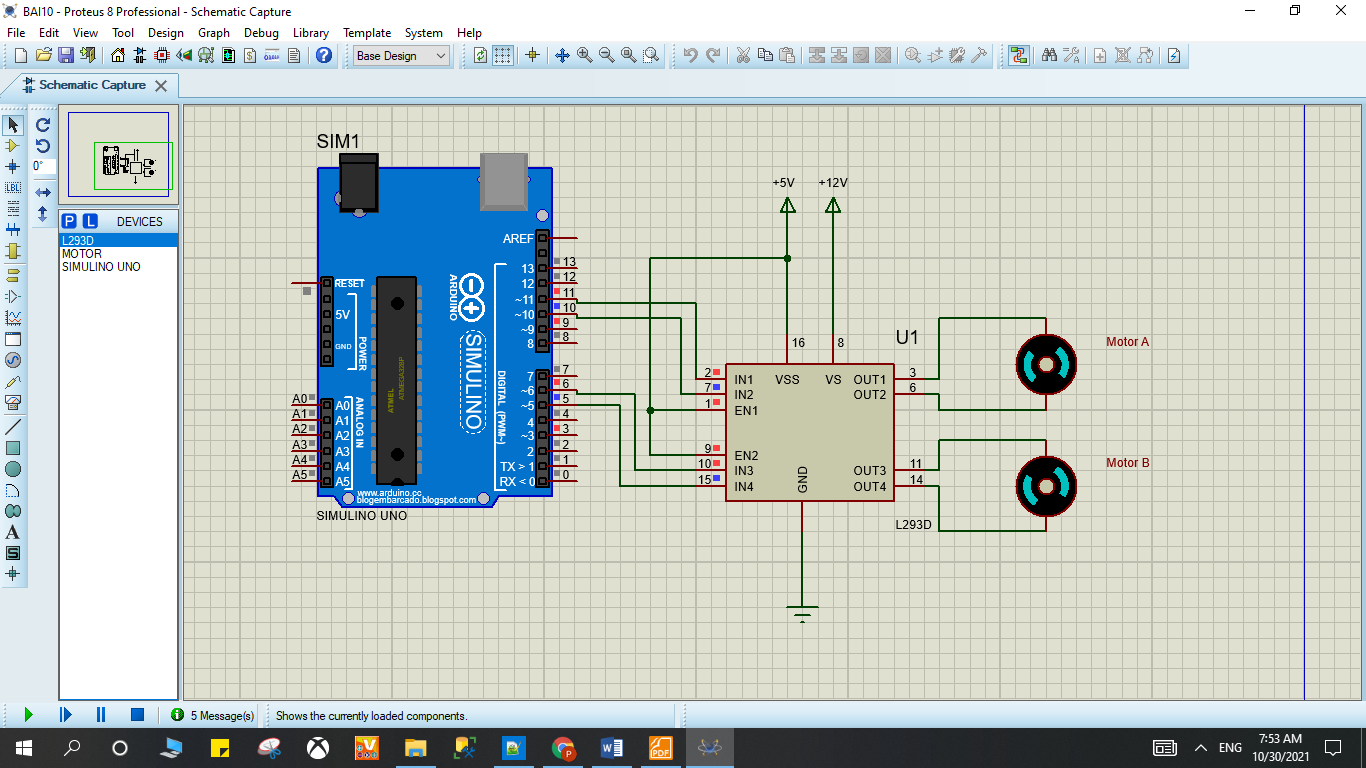
#### 2 Motor

#### 1 IC L293D

## Code chương trình

|  |
| --- |
| int A = 9;  int B = 3;  void setup()  {  pinMode(11, OUTPUT);  pinMode(10, OUTPUT);  pinMode(6, OUTPUT);  pinMode(5, OUTPUT);  pinMode(9, OUTPUT);  pinMode(3, OUTPUT);  digitalWrite(11, LOW);  digitalWrite(6, LOW);  digitalWrite(10, LOW);  digitalWrite(5, LOW);  }  void di()  {  analogWrite(A, 255);  analogWrite(B, 255);  digitalWrite(11, HIGH);  digitalWrite(6, HIGH);  digitalWrite(10, LOW);  digitalWrite(5, LOW);  delay(2000);    digitalWrite(11, LOW);  digitalWrite(6, LOW);  digitalWrite(10, HIGH);  digitalWrite(5, HIGH);  delay(2000);  digitalWrite(11, LOW);  digitalWrite(6, LOW);  digitalWrite(10, LOW);  digitalWrite(5, LOW);  }  // speed control motor A  void sc()  {  digitalWrite(11, LOW);  digitalWrite(10, HIGH);  for (int i=0;i<256;i++)  {  analogWrite(A,i);  delay(20);  }  for (int i=255;i>=0;--i)  {  analogWrite(A,i);  delay(20);  }  digitalWrite(11, LOW);  digitalWrite(10, LOW);  }  void loop()  {  di();  delay(1000);  sc();  delay(1000);  } |

## Kết quả chạy chương trình



Kết quả chạy chương trình

# Các bài làm thêm

Bài 1T. Bật tắt đèn LED bằng 2 button

## Mô tả

* Bài này thực hiện việc bật/tắt 1 đèn LED bằng 2 button, đèn LED được kết nối vào chân số 13 của board mạch, button thứ 1 trạng thái ON được kết nối vào chân số 3 của board mạch, button thứ trạng thái OFF được kết nối vào chân số 2 của board mạch, khi không bật button nào thì đèn tắt.

## Sơ đồ mạch và kết quả chạy chương trình

## 

## Linh kiện

#### 1 mạch Arduino Uno

#### 1 đèn LED-RED

#### 1 điện trở 220V

#### 2 Button

## Code chương trình

|  |
| --- |
| #define ON 3  #define OFF 2  #define led 13  // setup  void setup() {  pinMode(ON, INPUT\_PULLUP);  pinMode(OFF, INPUT\_PULLUP);  pinMode(led,OUTPUT);  }  void loop()  {  if(digitalRead(ON)==0){digitalWrite(led,1);}  if(digitalRead(OFF)==0){digitalWrite(led,0);}  } |

# Link liên kết các kho lưu trữ

Kho tinkercad : https://www.tinkercad.com/users/kUFa3qBF6IZ-toan-phong?category=circuits&sort=likes&view\_mode=default

Kho GitHub: https://github.com/phongctt60cntt/ProjectLapTrinhNhung/tree/master

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