C++ program by Walter 20210705

+++++++++++++++++++++++++++++++++++++++

算圓面積 2021.7.5

Input: radius

Output: 面積

// Example program

#include <iostream>

using namespace std;

int main() {

float PI = 3.14159;

int radius;

cout << "pleace enter a radius: ";

cin >> radius;

float count = radius;

count = count\* radius\* PI;

cout << "The area of this circle = " << count;

return 0;

}

++++++++++++++++++++++++++++++++++++++++++

BMI計算

Input:身高、體重

Output:BMI

2021.7.24

// Example program

#include <iostream>

using namespace std;

int main() {

float height;

float weight;

cout << "Please enter your height(m): ";

cin >> height;

cout << "Please enter your weight(kg): ";

cin >> weight;

float count;

count = weight/(height\*height);

cout << "Your BMI is: " << count;

return 0;

}

+++++++++++++++++++++++++++++++++++++++++=

IF ELSE 用法 2021.7.6

Input:score

Output:level

#include <iostream>

using namespace std;

int main() {

cout << "Enter your score : ";

float score;

cin >> score;

if ((score >= 80) && (score <= 100))

{

cout << "You get level A";

}

else if ((score >= 70) && (score <= 79.9))

{

cout << "You get level B";

}

else if ((score >= 60) && (score <= 69.9))

{

cout << "You get level C";

}

else

{

cout << "You get level F";

}

return 0;

}

++++++++++++++++++++++++++++++++++++++++++++++++

迴圈練習 2021.7.6

Output:1-10

10-1

#include <iostream>

using namespace std;

int main() {

for (int i=1; i<=10; i++)

{

cout << i << " ";

}

cout << "\n";

for (int i=10; i>=1; i--)

{

cout << i << " ";

}

return 0;

}

++++++++++++++++++++++++++++++++++++++++

雙層迴圈 2021.7.7

Input:height

Output:三角形陣列

#include <iostream>

using namespace std;

int main()

{

int height;

cout << "Enter the height: ";

cin >> height;

for (int i=1; i<=height; i++)

{

for (int j=1; j<=i; j++)

cout << j << " ";

cout << "\n";

}

return 0;

}

+++++++++++++++++++++++++++++++++++++++++++++++++++

IF FOR 矩形 2021.7.7

Input:邊常

Output:矩形

#include <iostream>

using namespace std;

int main()

{

int a;

cout << "Please enter the size of rectangle: ";

cin >> a;

for (int i=1; i<=a; i++)

{

if (i==1 || i==a)

{

for (int j=1; j<=a; j++)

{

cout << "\*";

}

}

else

{

for (int j=1; j<=a; j++)

{

if (j==1 || j==a)

{

cout << "\*";

}

else

{

cout << " ";

}

}

}

cout << "\n";

}

return 0;

}

+++++++++++++++++++++++++++++++++++++++++++++++

Switch 2021.7.7

Input:分數

Output:level

#include <iostream>

using namespace std;

int main()

{

int x;

cout << "輸入分數";

cin >> x;

x /= 10;

switch (x)

{

case 10:

cout << "Excellent";

break;

case 9:

cout << "Excellent";

break;

case 8:

cout << "perfect";

break;

case 7:

cout << "good";

break;

default:

cout << "OK";

break;

}

}

++++++++++++++++++++++++++++++++++++++++++++++++++++++++

函式 2021.7.7

Input:兩個數

Output:比大小

#include <iostream>

#include <string>

using namespace std;

int larger(int x,int y)

{

if (x>y)

{

return x;

}

return y;

}

int main()

{

int x,y,ans;

cout<<"輸入兩個數字比大小:";

cin >>x>>y;

ans=larger(x,y);

cout<<ans;

cout<<"比較大";

}

+++++++++++++++++++++++++++++++++++++++++++++++

函式2 2021.7.7

Input:1234

Output:4321

#include <iostream>

#include <string>

using namespace std;

void reverse(int x)

{

for (int i=0; i<4; i++)

{

cout<<x%10;

x/=10;

}

}

int main()

{

int x;

cin>>x;

reverse(x);

}

+++++++++++++++++++++++++++++++++++++++++++++++++++

電子元件

液晶顯示器

2021.7.10

#include <LiquidCrystal\_I2C.h>

LiquidCrystal\_I2C lcd(0x27,16,2);

void setup() {

lcd.init();

lcd.backlight();

lcd.setCursor(0,0);

lcd.print("I am happy");

delay(1500);

}

void loop() {

lcd.clear();

lcd.setCursor(0,0);

lcd.print("Hello");

delay(1000);

lcd.clear();

for (int i=0; i<16; i++){

lcd.setCursor(i,1);

lcd.print(“XDDD");

delay(1000);

lcd.clear();

}

delay(1000);

}

+++++++++++++++++++++++++++++++++++++++++++++

溫溼度檢測

2021.7.10

#include <DHT.h>

#include <DHT\_U.h>

#define DHTTYPE DHT11

#define pin 9

DHT dht9 (pin, DHTTYPE);

void setup(){

Serial.begin(9600);

dht9.begin();

}

void loop(){

Serial.print(dht9.readTemperature());

Serial.print("c,");

Serial.print(dht9.readHumidity());

Serial.println("%");

delay(2000);

}

+++++++++++++++++++++++++++++++++++++++++++++

伺服器馬達

2021.7.10

#include <Servo.h>

#define pin 9

Servo servo\_9;

void setup() {

servo\_9.attach(pin);

}

void loop() {

servo\_9.Write(0);

delay(500);

servo\_9.Write(90);

delay(500);

servo\_9.Write(150);

delay(500);

}

問題: exit status 1

'class Servo' has no member named 'Write'; did you mean 'write'?

++++++++++++++++++++++++++++++++++++++++

超音波

2021.7.10

#include <NewPing.h>

#define TRIGpin 12

#define ECHOpin 11

#define Max\_D 200

NewPing m(TRIGpin, ECHOpin, Max\_D);

void setup() {

Serial.begin(9600);

}

void loop() {

int us = m.ping();

if (us>0){

Serial.print(m.convert\_cm(us));

Serial.println("cm");

}

delay(100);

}

+++++++++++++++++++++++++++++++++++++++++++

LED矩陣

2021.7.10

#include <LedControl.h>

#define Height 8

#define DIN 8 // 定義接DIN的腳位在8

#define CS 7 // 定義接CS的腳位在7

#define CLK 6 // 定義接CLK的腳位在6

#define Width 8 // 8\*8矩陣

#define Height 8

LedControl LC = LedControl(DIN,CLK,CS,1);

// data pin/ clock pin/

// 決定是否要傳資料/ 連接幾個led矩陣

// 設定每個燈的亮暗 8\*8次

void Update(int Map[Height][Width])

{

for(int i=0; i<Height; i++)

{

for(int j=Width-1; j>=0; j--)

{

LC.setLed(0,j,i,Map[7-i][j]); // 更新亮暗

}

}

}

// 設定圖案

int On[8][8]={{0,0,1,1,1,1,0,0},

{0,1,0,0,0,0,1,0},

{1,0,1,0,0,1,0,1},

{1,0,0,0,0,0,0,1},

{1,0,1,0,0,1,0,1},

{1,0,0,1,1,0,0,1},

{0,1,0,0,0,0,1,0},

{0,0,1,1,1,1,0,0}};

void setup()

{

pinMode(DIN,OUTPUT); // 設定DIN腳位為輸出模式

pinMode(CS,OUTPUT); // 設定CS腳位為輸出模式

pinMode(CLK,OUTPUT); // 設定CLK腳位為輸出模式

LC.shutdown(0,false); // 供電

LC.setIntensity(0,5); // 設定亮暗 (0~15)

Update(On); // 更新圖案到顯示器上

}

void loop()

{

// 如果只想讓他亮 → 進入迴圈，但不跑任何程式

}

++++++++++++++++++++++++++++++++++++++++++++++

1. 要有初始狀態(0°) 2.手遮住光敏電阻 -> 伺服馬達運作 手離開光敏電阻 -> 伺服馬達立即停止 3.伺服馬達必須循環運作(0°-> 180°-> 0°->180° ...)

2021.7.12

#include <Servo.h>

Servo myservo; // 建立一個 servo

#define photocellPin A2 //定義光敏電阻 (photocell) 腳位

int photocellVal = 0; // photocell variable

int minLight = 100; // 最小光線門檻值

int pos = 0; // 設定 Servo 角度的變數

int reset = 0;

int flag = 0 ; // 判斷順時轉(0)、逆時轉(1)的旗幟

void setup() {

Serial.begin(9600);

myservo.attach(9);// 將 servo 物件連接到 pin 9

myservo.write(reset);// reset 至 0 度

}

void loop() {

Serial.println(/\*photocellVal\*/pos); // 可監控亮度值or角度

photocellVal = analogRead(photocellPin); // 讀取亮度值

if(photocellVal<minLight){

if(flag == 0){

pos++;

myservo.write(pos);// 告訴 servo 走到 'pos' 的位置

delay(5); // 等待 5ms 讓 servo 走到指定位置

if(pos == 180) // 角度++到180度時，改逆時針轉

flag = 1;

}

if(flag == 1){

pos--;

myservo.write(pos); // 告訴 servo 走到 'pos' 的位置

delay(5); // 等待 5ms 讓 servo 走到指定位置

if(pos == 0) // 角度--到0度時，改順時針轉

flag = 0;

}

}

}

+++++++++++++++++++++++++++++++++++++++++++++++++

初始狀態為全暗

暗住亮

放開暗

2021.7.12

#include <LedControl.h>

#define CIN 6

#define CS 7

#define CLK 8

#define Button 2

#define Width 8

#define Height 8

LedControl LC = LedControl(CIN,CLK,CS,1);

void Update(int Map[Height][Width]) // LED 更新函式

{

for(int i=0;i<Height;i++)

{

for(int j=0;j<Width;j++)

{

bool temp;

if(Map[i][j]==0)

{

temp=false;

}

else

{

temp=true;

}

LC.setLed(0,j,i,Map[7-i][j]);

}

}

}

int On[8][8]={{0,0,0,0,0,0,0,0},

{0,0,0,0,1,0,0,0},

{0,0,1,0,1,0,1,0},

{0,0,0,1,1,1,0,0},

{0,1,1,1,0,1,1,1},

{0,0,0,1,1,1,0,0},

{0,0,1,0,1,0,1,0},

{0,0,0,0,1,0,0,0}};

int state = 0;

void setup()

{

pinMode(CIN,OUTPUT);

pinMode(CS,OUTPUT);

pinMode(CLK,OUTPUT);

pinMode(Button,INPUT);

LC.shutdown(0,false);

LC.setIntensity(0,15);//(0~15)

LC.clearDisplay(0);

Serial.begin(9600);

}

void loop()

{

Serial.println(state);

switch (state)

{

case 0://燈泡暗

LC.clearDisplay(0);

if(digitalRead(Button) == HIGH)

{

state = 1;

}

break;

case 1://燈泡亮

Update(On);

if(digitalRead(Button) == LOW)

{

state = 0;

}

break;

}

}

++++++++++++++++++++++++++++++++++++++++++++++++++++++

LED初始狀態為全暗

按一下放開:亮

在按一下:暗

2021.7.12

#include <LedControl.h>

#define CIN 6

#define CS 7

#define CLK 8

#define Button 2

#define Width 8

#define Height 8

LedControl LC = LedControl(CIN,CLK,CS,1);

void Update(int Map[Height][Width])

{

for(int i=0;i<Height;i++)

{

for(int j=0;j<Width;j++)

{

bool temp;

if(Map[i][j]==0)

{

temp=false;

}

else

{

temp=true;

}

LC.setLed(0,j,i,Map[7-i][j]);

}

}

}

int On[8][8]={{0,0,0,0,0,0,0,0},

{0,0,0,0,1,0,0,0},

{0,0,1,0,1,0,1,0},

{0,0,0,1,1,1,0,0},

{0,1,1,1,0,1,1,1},

{0,0,0,1,1,1,0,0},

{0,0,1,0,1,0,1,0},

{0,0,0,0,1,0,0,0}};

int state = 0;

void setup()

{

pinMode(CIN,OUTPUT);

pinMode(CS,OUTPUT);

pinMode(CLK,OUTPUT);

pinMode(Button,INPUT);

LC.shutdown(0,false);

LC.setIntensity(0,10);//(0~15)

LC.clearDisplay(0);

//Update(On);

Serial.begin(9600);

}

void loop()

{

Serial.println(state);

switch (state)

{

case 0: //燈暗 按鈕放

LC.clearDisplay(0);

if(digitalRead(Button) == HIGH)

{

state = 1;

}

break;

case 1: //燈暗 按鈕押

if(digitalRead(Button) == LOW)

{

state = 2;

}

break;

case 2: //燈亮 按鈕放

Update(On);

if(digitalRead(Button) == HIGH)

{

state = 3;

}

break;

case 3: //燈亮 按鈕押

if(digitalRead(Button) == LOW)

{

state = 0;

}

break;

}

}

++++++++++++++++++++++++++++++++++++++++++++++++++++++++3

蜂鳴器(基礎)

2021.7.21

#define pin 2

int frequency[7] = {262,294,330,369,415,523};

void setup() {

pinMode(pin,OUTPUT);

}

void loop() {

for(int i=0; i<7; i++)

{

tone(pin, frequency[i]);

delay(100);

noTone(pin);

}

}

++++++++++++++++++++++++++++++++++++++++++++++++

1.產生隨機一數，並用可變電阻旋鈕猜測之

2.讀取值與隨機數之差越靠近，LED越亮

3.讀取值與隨機數之差小於10時，蜂鳴器響起2秒

4.蜂鳴器響後需再重新產生一隨機數

2021.7.21

#define LED 6

#define buzzer 5

#define threshold 10// 容許誤差值(error)

int r = random(0, 255); // 0-255間取一數字

void setup() {

pinMode(LED,OUTPUT); // 定義LED腳位

pinMode(buzzer,OUTPUT); // 定義buzzer 腳位

}

void loop() {

int pwm = analogRead(A0)/4; // 讀取A0腳位的值(範圍0-1023)，pwm(範圍0-255)

if (abs(pwm-r) < threshold){ // abs取絕對值

tone(buzzer,523); // buzzer發聲

delay(2000); // 持續2秒

r = random(0, 255); // 重取隨機數

}

else{

noTone(buzzer);; // buzzer不發聲

}

analogWrite(LED,255-abs(r-pwm)); // 越靠近隨機數Led越亮

}

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

1.按住按鈕使蜂鳴器持續響出聲音，放開則無

2.一組須做出Do Re Mi Fa So La Si (一人兩個)

2021.7.21