#include <16F887.H>

#FUSES HS // SU DUNG THANH ANH NGOAI 20m

#USE DELAY(CLOCK=20000000)

#define LCD\_ENABLE\_PIN PIN\_D3

#define LCD\_RS\_PIN PIN\_D1

#define LCD\_RW\_PIN PIN\_D2

#define LCD\_DATA4 PIN\_D4

#define LCD\_DATA5 PIN\_D5

#define LCD\_DATA6 PIN\_D6

#define LCD\_DATA7 PIN\_D7

#include <lcd.c>

#define trigger pin\_b0

#define echo pin\_b1

#define buzzer\_pin PIN\_B2

#define led\_pin PIN\_B3

float kcsa, kcsb;

unsigned int32 gt\_tran;

signed int32 kc;

#int\_timer1

void interrupt\_timer1() {

gt\_tran++;

}

void doc\_kc() {

gt\_tran=0;

output\_low(trigger);

delay\_ms(50);

output\_high(trigger);

delay\_ms(10);

output\_low(trigger);

set\_timer1(0);

while((input(echo))==0);

SETUP\_TIMER\_1(T1\_INTERNAL);

while(input(echo)==1);

kcsa = GET\_TIMER1();

SETUP\_TIMER\_1(T1\_DISABLED);

kcsb = kcsa + gt\_tran\*65536;

kcsb = kcsb/5;

kcsb = kcsb/58;

kc = kcsb;

if(kc>400) kc=400;

}

void main() {

set\_tris\_d(0x00);

set\_tris\_b(0x02);

lcd\_init();

SETUP\_TIMER\_1(T1\_DISABLED);

ENABLE\_INTERRUPTS(GLOBAL);

ENABLE\_INTERRUPTS(INT\_TIMER1);

gt\_tran=0;

delay\_ms(1000);

while(true) {

doc\_kc();

lcd\_gotoxy(1,1);

printf(lcd\_putc," KHOANG CACH ");

lcd\_gotoxy(1,2);

printf(lcd\_putc," %ld",kc);

lcd\_putc("cm ");

delay\_ms(200);

if (kc < 50) {

// Buzzer warning

int i;

for (i = 0; i < 5; i++) {

output\_high(buzzer\_pin);

output\_high(led\_pin);

delay\_ms(100);

output\_low(buzzer\_pin);

output\_low(led\_pin);

delay\_ms(100);

}

}

}

}