

```

long valueminutos;

long valuesegundos;

long valuetotal;

char minutos[]="000";

char segundos[]="00";

#include <Wire.h>

#include <FabricaDigital_MCP23008.h>

#include <Keypad_MCP23008.h>

#include <LiquidCrystal_I2C.h>


LiquidCrystal_I2C lcd5 (0x27,16,2); LiquidCrystal_I2C lcd4 (0x26,16,2); LiquidCrystal_I2C lcd3
(0x3F,16,2); LiquidCrystal_I2C lcd2 (0x3E,16,2); LiquidCrystal_I2C lcd1 (0x3B,16,2);


FabricaDigital_MCP23008 pinesExtra(0x23);


int TiempoInicio=0;

int Offset=0;

int LevelsensorStateAGB;

int LevelsensorStateTM;

const byte I2C_ADDRESS = 0x20;

const byte FILAS=4;

const byte COLUMNAS=4;

char keys[FILAS][COLUMNAS]={

    {'1','2','3','A'},

    {'4','5','6','B'},

    {'7','8','9','C'},

    {'*','0','#','D'}

};

byte pinesFilas[FILAS]={7,6,5,4};

```

```
byte pinesColumnas[COLUMNAS]={3,2,1,0};  
Keypad_MCP23008 keypad = Keypad_MCP23008(pinesFilas, pinesColumnas, FILAS, COLUMNAS);  
char TECLA;  
char TECLA2;  
char TECLA3a;  
char TECLA3b;  
char TECLA3c;  
char TECLA3d;  
char CLAVE[6];  
char CLAVE2;  
char CLAVEA[5];  
char CLAVEB[5];  
char CLAVEC[5];  
char CLAVED[5];  
char CLAVE_MAESTRA[6]="123ABC";  
byte INDICE=0;  
byte INDICEA=0;  
byte INDICEB=0;  
byte INDICEC=0;  
byte INDICED=0;  
int MODO;  
int BOTONTIEMPO;  
char VariableObjetivo[]="98765";  
int T1=0;  
int T2=12;  
int T3=66;  
int T4=32;  
int T5=79;
```

```

void setup() {
    keypad.begin(I2C_ADDRESS, makeKeymap(keys));
    lcd1.init(); lcd2.init(); lcd3.init(); lcd4.init(); lcd5.init();
    lcd1.backlight(); lcd2.backlight(); lcd3.backlight(); lcd4.backlight(); lcd5.backlight();
    pinMode(2,OUTPUT); //bomba alimentación
    pinMode(3,OUTPUT); // aireación AGB
    pinMode(4,OUTPUT); // aireación TM
    pinMode(5,OUTPUT); // electroválvula
    pinMode(6,OUTPUT); // bomba permeado
    pinMode(7,INPUT); // sensor de nivel AGB
    pinMode(8,INPUT); // sensor de nivel TM
    pinesExtra.begin();
    pinesExtra.pinMode(0,INPUT); // automático-manual
    pinesExtra.pinMode(1,INPUT); // bomba alimentación
    pinesExtra.pinMode(2,INPUT); // aireación AGB
    pinesExtra.pinMode(3,INPUT); // aireación TM
    pinesExtra.pinMode(4,INPUT); // electroválvula
    pinesExtra.pinMode(5,INPUT); // bomba permeado
    pinesExtra.pinMode(6,INPUT); // ajuste de tiempos
    Serial.begin(9600);
}

```

```

void loop() {
    unsigned long Tiempo=(millis()/1000);
    int TiempoActual=Tiempo+TiempoInicio-Offset;

```

```
int minutesT2=T2 % 3600/60; int secondsT2=T2 % 60; int minutesT3=T3 % 3600/60; int
secondsT3=T3 % 60; int minutesT4=T4 % 3600/60; int secondsT4=T4 % 60; int minutesT5=T5 %
3600/60; int secondsT5=T5 % 60;
```

```
if (TiempoActual>=T1 && TiempoActual<(T1+T2)){
```

```
int minutes1=(TiempoActual-T1) % 3600/60; int seconds1=(TiempoActual-T1) % 60;
```

```
lcd1.setCursor(0,0); lcd1.print("F1: Llenado"); lcd1.setCursor(0,1); lcd1.print(minutes1 < 10 ? "0"
: ""); lcd1.print(minutes1); lcd1.print(":"); lcd1.print(seconds1 < 10 ? "0" : ""); lcd1.print(seconds1);
lcd1.print("/"); lcd1.print(minutesT2 < 10 ? "0" : ""); lcd1.print(minutesT2); lcd1.print(":");
lcd1.print(secondsT2 < 10 ? "0" : ""); lcd1.print(secondsT2);
```

```
lcd2.setCursor(0,0); lcd2.print("F2: Aireacion"); lcd2.setCursor(0,1); lcd2.print("00:00");
lcd2.print("/"); lcd2.print(minutesT3 < 10 ? "0" : ""); lcd2.print(minutesT3); lcd2.print(":");
lcd2.print(secondsT3 < 10 ? "0" : ""); lcd2.print(secondsT3);
```

```
lcd3.setCursor(0,0); lcd3.print("F3: Decantacion"); lcd3.setCursor(0,1); lcd3.print("00:00");
lcd3.print("/"); lcd3.print(minutesT4 < 10 ? "0" : ""); lcd3.print(minutesT4); lcd3.print(":");
lcd3.print(secondsT4 < 10 ? "0" : ""); lcd3.print(secondsT4);
```

```
lcd4.setCursor(0,0); lcd4.print("F4: Vaciado"); lcd4.setCursor(0,1); lcd4.print("00:00");
lcd4.print("/"); lcd4.print(minutesT5 < 10 ? "0" : ""); lcd4.print(minutesT5); lcd4.print(":");
lcd4.print(secondsT5 < 10 ? "0" : ""); lcd4.print(secondsT5);
```

```
}
```

```
else if (TiempoActual>=(T1+T2) && TiempoActual<(T1+T2+T3)){
```

```
int minutes2=(TiempoActual-T1-T2) % 3600/60; int seconds2=(TiempoActual-T1-T2) % 60;
```

```
lcd1.setCursor(0,0); lcd1.print("F1: Llenado"); lcd1.setCursor(0,1); lcd1.print(minutesT2 < 10 ?
"0" : ""); lcd1.print(minutesT2); lcd1.print(":"); lcd1.print(secondsT2 < 10 ? "0" : "");
lcd1.print(secondsT2); lcd1.print("/"); lcd1.print(minutesT2 < 10 ? "0" : ""); lcd1.print(minutesT2);
lcd1.print(":"); lcd1.print(secondsT2 < 10 ? "0" : ""); lcd1.print(secondsT2);
```

```
lcd2.setCursor(0,0); lcd2.print("F2: Aireacion"); lcd2.setCursor(0,1); lcd2.print(minutes2 < 10 ?
"0" : ""); lcd2.print(minutes2); lcd2.print(":"); lcd2.print(seconds2 < 10 ? "0" : "");
lcd2.print(seconds2); lcd2.print("/"); lcd2.print(minutesT3 < 10 ? "0" : ""); lcd2.print(minutesT3);
lcd2.print(":"); lcd2.print(secondsT3 < 10 ? "0" : ""); lcd2.print(secondsT3);
```

```
lcd3.setCursor(0,0); lcd3.print("F3: Decantacion"); lcd3.setCursor(0,1); lcd3.print("00:00");
lcd3.print("/"); lcd3.print(minutesT4 < 10 ? "0" : ""); lcd3.print(minutesT4); lcd3.print(":");
lcd3.print(secondsT4 < 10 ? "0" : ""); lcd3.print(secondsT4);
```

```

    lcd4.setCursor(0,0); lcd4.print("F4: Vaciado"); lcd4.setCursor(0,1); lcd4.print("00:00");
    lcd4.print("/"); lcd4.print(minutesT5 < 10 ? "0" : ""); lcd4.print(minutesT5); lcd4.print(":");
    lcd4.print(secondsT5 < 10 ? "0" : ""); lcd4.print(secondsT5);
}

```

```

else if (TiempoActual>=(T1+T2+T3) && TiempoActual<(T1+T2+T3+T4)){

```

```

    int minutes3=(TiempoActual-T1-T2-T3) % 3600/60; int seconds3=(TiempoActual-T1-T2-T3) % 60;

```

```

    lcd1.setCursor(0,0); lcd1.print("F1: Llenado"); lcd1.setCursor(0,1); lcd1.print(minutesT2 < 10 ?
    "0" : ""); lcd1.print(minutesT2); lcd1.print(":"); lcd1.print(secondsT2 < 10 ? "0" : "");
    lcd1.print(secondsT2); lcd1.print("/"); lcd1.print(minutesT2 < 10 ? "0" : ""); lcd1.print(minutesT2);
    lcd1.print(":"); lcd1.print(secondsT2 < 10 ? "0" : ""); lcd1.print(secondsT2);

```

```

    lcd2.setCursor(0,0); lcd2.print("F2: Aireacion"); lcd2.setCursor(0,1); lcd2.print(minutesT3 < 10 ?
    "0" : ""); lcd2.print(minutesT3); lcd2.print(":"); lcd2.print(secondsT3 < 10 ? "0" : "");
    lcd2.print(secondsT3); lcd2.print("/"); lcd2.print(minutesT3 < 10 ? "0" : ""); lcd2.print(minutesT3);
    lcd2.print(":"); lcd2.print(secondsT3 < 10 ? "0" : ""); lcd2.print(secondsT3);

```

```

    lcd3.setCursor(0,0); lcd3.print("F3: Decantacion"); lcd3.setCursor(0,1); lcd3.print(minutes3 < 10 ?
    "0" : ""); lcd3.print(minutes3); lcd3.print(":"); lcd3.print(seconds3 < 10 ? "0" : "");
    lcd3.print(seconds3); lcd3.print("/"); lcd3.print(minutesT4 < 10 ? "0" : ""); lcd3.print(minutesT4);
    lcd3.print(":"); lcd3.print(secondsT4 < 10 ? "0" : ""); lcd3.print(secondsT4);

```

```

    lcd4.setCursor(0,0); lcd4.print("F4: Vaciado"); lcd4.setCursor(0,1); lcd4.print("00:00");
    lcd4.print("/"); lcd4.print(minutesT5 < 10 ? "0" : ""); lcd4.print(minutesT5); lcd4.print(":");
    lcd4.print(secondsT5 < 10 ? "0" : ""); lcd4.print(secondsT5);
}

```

```

else if (TiempoActual>=(T1+T2+T3+T4) && TiempoActual<(T1+T2+T3+T4+T5)){

```

```

    int minutes4=(TiempoActual-T1-T2-T3-T4) % 3600/60; int seconds4=(TiempoActual-T1-T2-T3-T4)
    % 60;

```

```

    lcd1.setCursor(0,0); lcd1.print("F1: Llenado"); lcd1.setCursor(0,1); lcd1.print(minutesT2 < 10 ?
    "0" : ""); lcd1.print(minutesT2); lcd1.print(":"); lcd1.print(secondsT2 < 10 ? "0" : "");
    lcd1.print(secondsT2); lcd1.print("/"); lcd1.print(minutesT2 < 10 ? "0" : ""); lcd1.print(minutesT2);
    lcd1.print(":"); lcd1.print(secondsT2 < 10 ? "0" : ""); lcd1.print(secondsT2);

```

```

    lcd2.setCursor(0,0); lcd2.print("F2: Aireacion"); lcd2.setCursor(0,1); lcd2.print(minutesT3 < 10 ?
    "0" : ""); lcd2.print(minutesT3); lcd2.print(":"); lcd2.print(secondsT3 < 10 ? "0" : "");
    lcd2.print(secondsT3); lcd2.print("/"); lcd2.print(minutesT3 < 10 ? "0" : ""); lcd2.print(minutesT3);
    lcd2.print(":"); lcd2.print(secondsT3 < 10 ? "0" : ""); lcd2.print(secondsT3);

```

```

    lcd3.setCursor(0,0); lcd3.print("F3: Decantacion"); lcd3.setCursor(0,1); lcd3.print(minutesT4 < 10
? "0" : ""); lcd3.print(minutesT4); lcd3.print(":"); lcd3.print(secondsT4 < 10 ? "0" : "");
lcd3.print(secondsT4); lcd3.print("/"); lcd3.print(minutesT4 < 10 ? "0" : ""); lcd3.print(minutesT4);
lcd3.print(":"); lcd3.print(secondsT4 < 10 ? "0" : ""); lcd3.print(secondsT4);

```

```

    lcd4.setCursor(0,0); lcd4.print("F4: Vaciado"); lcd4.setCursor(0,1); lcd4.print(minutes4 < 10 ? "0"
: ""); lcd4.print(minutes4); lcd4.print(":"); lcd4.print(seconds4 < 10 ? "0" : ""); lcd4.print(seconds4);
lcd4.print("/"); lcd4.print(minutesT5 < 10 ? "0" : ""); lcd4.print(minutesT5); lcd4.print(":");
lcd4.print(secondsT5 < 10 ? "0" : ""); lcd4.print(secondsT5);

```

```

}

```

```

else if (TiempoActual>=(T1+T2+T3+T4+T5)){

```

```

    lcd1.setCursor(0,0); lcd1.print("F1: Llenado"); lcd1.setCursor(0,1); lcd1.print(minutesT2 < 10 ?
"0" : ""); lcd1.print(minutesT2); lcd1.print(":"); lcd1.print(secondsT2 < 10 ? "0" : "");
lcd1.print(secondsT2); lcd1.print("/"); lcd1.print(minutesT2 < 10 ? "0" : ""); lcd1.print(minutesT2);
lcd1.print(":"); lcd1.print(secondsT2 < 10 ? "0" : ""); lcd1.print(secondsT2);

```

```

    lcd2.setCursor(0,0); lcd2.print("F2: Aireacion"); lcd2.setCursor(0,1); lcd2.print(minutesT3 < 10 ?
"0" : ""); lcd2.print(minutesT3); lcd2.print(":"); lcd2.print(secondsT3 < 10 ? "0" : "");
lcd2.print(secondsT3); lcd2.print("/"); lcd2.print(minutesT3 < 10 ? "0" : ""); lcd2.print(minutesT3);
lcd2.print(":"); lcd2.print(secondsT3 < 10 ? "0" : ""); lcd2.print(secondsT3);

```

```

    lcd3.setCursor(0,0); lcd3.print("F3: Decantacion"); lcd3.setCursor(0,1); lcd3.print(minutesT4 < 10
? "0" : ""); lcd3.print(minutesT4); lcd3.print(":"); lcd3.print(secondsT4 < 10 ? "0" : "");
lcd3.print(secondsT4); lcd3.print("/"); lcd3.print(minutesT4 < 10 ? "0" : ""); lcd3.print(minutesT4);
lcd3.print(":"); lcd3.print(secondsT4 < 10 ? "0" : ""); lcd3.print(secondsT4);

```

```

    lcd4.setCursor(0,0); lcd4.print("F4: Vaciado"); lcd4.setCursor(0,1); lcd4.print(minutesT5 < 10 ?
"0" : ""); lcd4.print(minutesT5); lcd4.print(":"); lcd4.print(secondsT5 < 10 ? "0" : "");
lcd4.print(secondsT5); lcd4.print("/"); lcd4.print(minutesT5 < 10 ? "0" : ""); lcd4.print(minutesT5);
lcd4.print(":"); lcd4.print(secondsT5 < 10 ? "0" : ""); lcd4.print(secondsT5);

```

```

    TiempoInicio=0; Offset=Tiempo; lcd1.clear(); lcd1.clear(); lcd2.clear(); lcd2.clear(); lcd3.clear();
lcd3.clear(); lcd4.clear(); lcd4.clear();

```

```

}

```

```

MOD0=pinesExtra.digitalRead(0);

```

```

if (MOD0==0){

```

```

    lcd5.setCursor(0,0);

```

```

    lcd5.print("Modo: automatico  ");

```

```

lcd5.setCursor(0,1);
lcd5.print("          ");
INDICE=0;
INDICEA=0;
CLAVE2=0;
LevelsensorStateTM=digitalRead(8);

if (LevelsensorStateTM==LOW){
    digitalWrite(4,LOW);
    digitalWrite(6,LOW);
}
else if (LevelsensorStateTM==HIGH){
    digitalWrite(4,HIGH);
    digitalWrite(6,HIGH);
}

if (TiempoActual>=T1 && TiempoActual<(T1+T2)){
    LevelsensorStateAGB=digitalRead(7);
    if (LevelsensorStateAGB==HIGH){
        digitalWrite(2,LOW);
        digitalWrite(3,HIGH);
        digitalWrite(5,HIGH);
    }
    else if (LevelsensorStateAGB==LOW){
        digitalWrite(2,HIGH);
        digitalWrite(3,HIGH);
        digitalWrite(5,HIGH);
    }
}
}

```

```
else if (TiempoActual>=(T1+T2) && TiempoActual<(T1+T2+T3)){  
    digitalWrite(2,HIGH);  
    digitalWrite(3,LOW);  
    digitalWrite(5,HIGH);  
}
```

```
else if (TiempoActual>=(T1+T2+T3) && TiempoActual<(T1+T2+T3+T4)){  
    digitalWrite(2,HIGH);  
    digitalWrite(3,HIGH);  
    digitalWrite(5,HIGH);  
}
```

```
else if (TiempoActual>=(T1+T2+T3+T4) && TiempoActual<(T1+T2+T3+T4+T5)){  
    digitalWrite(2,HIGH);  
    digitalWrite(3,HIGH);  
    digitalWrite(5,LOW);  
}  
}
```

```
else if (MODO==1){  
    if (INDICE<6){  
        lcd5.setCursor(0,0);  
        lcd5.print("Modo: manual    ");  
        lcd5.setCursor(0,1);  
        lcd5.print("Codigo:");  
        TECLA=keypad.getKey();  
        if (TECLA){  
            CLAVE[INDICE]=TECLA;
```

```
lcd5.setCursor(INDICE+8,1);  
lcd5.print(TECLA);  
lcd5.print("      ");  
INDICE++;  
}
```

```
LevelsensorStateTM=digitalRead(8);  
if (LevelsensorStateTM==LOW){  
    digitalWrite(4,LOW);  
    digitalWrite(6,LOW);  
}  
else if (LevelsensorStateTM==HIGH){  
    digitalWrite(4,HIGH);  
    digitalWrite(6,HIGH);  
}
```

```
if (TiempoActual>=T1 && TiempoActual<(T1+T2)){  
    LevelsensorStateAGB=digitalRead(7);  
    if (LevelsensorStateAGB==HIGH){  
        digitalWrite(2,LOW);  
        digitalWrite(3,HIGH);  
        digitalWrite(5,HIGH);  
    }  
    else if (LevelsensorStateAGB==LOW){  
        digitalWrite(2,HIGH);  
        digitalWrite(3,HIGH);  
        digitalWrite(5,HIGH);  
    }  
}
```

```
else if (TiempoActual>=(T1+T2) && TiempoActual<(T1+T2+T3)){  
    digitalWrite(2,HIGH);  
    digitalWrite(3,LOW);  
    digitalWrite(5,HIGH);  
}
```

```
else if (TiempoActual>=(T1+T2+T3) && TiempoActual<(T1+T2+T3+T4)){  
    digitalWrite(2,HIGH);  
    digitalWrite(3,HIGH);  
    digitalWrite(5,HIGH);  
}
```

```
else if (TiempoActual>=(T1+T2+T3+T4) && TiempoActual<(T1+T2+T3+T4+T5)){  
    digitalWrite(2,HIGH);  
    digitalWrite(3,HIGH);  
    digitalWrite(5,LOW);  
}  
}
```

```
if (INDICE>=6){  
    BOTONTIEMPO=pinesExtra.digitalRead(6);  
    if(CLAVE[0]==CLAVE_MAESTRA[0] && CLAVE[1]==CLAVE_MAESTRA[1] &&  
CLAVE[2]==CLAVE_MAESTRA[2] && CLAVE[3]==CLAVE_MAESTRA[3] &&  
CLAVE[4]==CLAVE_MAESTRA[4] && CLAVE[5]==CLAVE_MAESTRA[5] && BOTONTIEMPO==0){  
        lcd5.setCursor(0,1);  
        lcd5.print("Codigo: Correcto  ");  
        INDICEA=0;  
        INDICEB=0;  
        INDICEC=0;
```

INDICED=0;

CLAVE2=0;

if (pinesExtra.digitalRead(1)==0){

 digitalWrite(2,LOW);

}

else if (pinesExtra.digitalRead(1)==1){

 LevelsensorStateAGB=digitalRead(7);

 if (LevelsensorStateAGB==HIGH){

 digitalWrite(2,HIGH);

 }

 else if (LevelsensorStateAGB==LOW){

 digitalWrite(2,LOW);

 }

}

if (pinesExtra.digitalRead(2)==0){

 digitalWrite(3,LOW);

}

else if (pinesExtra.digitalRead(2)==1){

 digitalWrite(3,HIGH);

}

if (pinesExtra.digitalRead(3)==0){

 digitalWrite(4,LOW);

}

else if (pinesExtra.digitalRead(3)==1){

 digitalWrite(4,HIGH);

}

```

    if (pinesExtra.digitalRead(4)==0){
        digitalWrite(5,LOW);
    }
    else if (pinesExtra.digitalRead(4)==1){
        digitalWrite(5,HIGH);
    }

    if (pinesExtra.digitalRead(5)==0){
        digitalWrite(2,LOW);
    }
    else if (pinesExtra.digitalRead(5)==1){
        if (LevelsensorStateAGB==HIGH){
            digitalWrite(2,LOW);
        }
        else if (LevelsensorStateAGB==LOW){
            digitalWrite(2,HIGH);
        }
    }
}

else if (CLAVE[0]==CLAVE_MAESTRA[0] && CLAVE[1]==CLAVE_MAESTRA[1] &&
CLAVE[2]==CLAVE_MAESTRA[2] && CLAVE[3]==CLAVE_MAESTRA[3] &&
CLAVE[4]==CLAVE_MAESTRA[4] && CLAVE[5]==CLAVE_MAESTRA[5] && BOTONTIEMPO==1){
    if (pinesExtra.digitalRead(1)==0){
        digitalWrite(1,LOW);
    }
    else if (pinesExtra.digitalRead(1)==1){
        if (LevelsensorStateAGB==HIGH){
            digitalWrite(2,HIGH);
        }
    }
}

```

```
else if (LevelsensorStateAGB==LOW){  
    digitalWrite(2,LOW);  
}  
}
```

```
if (pinesExtra.digitalRead(2)==0){  
    digitalWrite(3,LOW);  
}  
else if (pinesExtra.digitalRead(2)==1){  
    digitalWrite(3,HIGH);  
}
```

```
if (pinesExtra.digitalRead(3)==0){  
    digitalWrite(4,LOW);  
}  
else if (pinesExtra.digitalRead(3)==1){  
    digitalWrite(4,HIGH);  
}
```

```
if (pinesExtra.digitalRead(4)==0){  
    digitalWrite(5,LOW);  
}  
else if (pinesExtra.digitalRead(4)==1){  
    digitalWrite(5,HIGH);  
}
```

```
if (pinesExtra.digitalRead(5)==0){  
    digitalWrite(2,LOW);  
}
```

```

else if (pinesExtra.digitalRead(5)==1){
    if (LevensensorStateAGB==HIGH){
        digitalWrite(2,LOW);
    }
    else if (LevensensorStateAGB==LOW){
        digitalWrite(2,HIGH);
    }
}

TECLA2=keypad.getKey();
if ((TECLA2) && (TECLA2=='A' || TECLA2=='B' || TECLA2=='C' || TECLA2=='D')){
    CLAVE2=TECLA2;
}
switch (CLAVE2){
    case 'A':
        lcd5.setCursor(0,0);
        lcd5.print("Modo: manual    ");
        lcd5.setCursor(0,1);
        lcd5.print("F: A, T:");
        if (INDICEA<5){
            TECLA3a=keypad.getKey();

            if ((TECLA3a) && (TECLA3a=='1' || TECLA3a=='2' || TECLA3a=='3' || TECLA3a=='4' ||
TECLA3a=='5' || TECLA3a=='6' || TECLA3a=='7' || TECLA3a=='8' || TECLA3a=='9' ||
TECLA3a=='0')){

                lcd5.setCursor(12,1);
                lcd5.print('m');
                lcd5.setCursor(15,1);
                lcd5.print('s');
                CLAVEA[INDICEA]=TECLA3a;
                if (INDICEA<3){

```

```

        lcd5.setCursor(INDICEA+9,1);

        lcd5.print(TECLA3a);
    }

    else if (INDICEA>=3 && INDICEA<5){

        lcd5.setCursor(INDICEA+10,1);

        lcd5.print(TECLA3a);
    }

    INDICEA++;
}

}

if (INDICEA>=5){

    VariableObjetivo[0]=CLAVEA[0]; VariableObjetivo[1]=CLAVEA[1];
VariableObjetivo[2]=CLAVEA[2]; VariableObjetivo[3]=CLAVEA[3]; VariableObjetivo[4]=CLAVEA[4];

    CLAVE2=0;

}

break;

case 'B':

    lcd5.setCursor(0,0);

    lcd5.print("Modo: manual    ");

    lcd5.setCursor(0,1);

    lcd5.print("F: B, T:");

    if (INDICEB<5){

        TECLA3b=keypad.getKey();

        if ((TECLA3b) && (TECLA3b=='1' || TECLA3b=='2' || TECLA3b=='3' || TECLA3b=='4' ||
TECLA3b=='5' || TECLA3b=='6' || TECLA3b=='7' || TECLA3b=='8' || TECLA3b=='9' ||
TECLA3b=='0')){

            lcd5.setCursor(12,1);

            lcd5.print('m');

            lcd5.setCursor(15,1);

            lcd5.print('s');

```

```

    CLAVEB[INDICEB]=TECLA3b;

    if (INDICEB<3){

        lcd5.setCursor(INDICEB+9,1);

        lcd5.print(TECLA3b);

    }

    else if (INDICEB>=3 && INDICEB<5){

        lcd5.setCursor(INDICEB+10,1);

        lcd5.print(TECLA3b);

    }

    INDICEB++;

}

}

if (INDICEB>=5){

    VariableObjetivo[0]=CLAVEB[0]; VariableObjetivo[1]=CLAVEB[1];
VariableObjetivo[2]=CLAVEB[2]; VariableObjetivo[3]=CLAVEB[3]; VariableObjetivo[4]=CLAVEB[4];

    CLAVE2=0;

}

break;

case 'C':

    lcd5.setCursor(0,0);

    lcd5.print("Modo: manual    ");

    lcd5.setCursor(0,1);

    lcd5.print("F: C, T:");

    if (INDICEC<5){

        TECLA3c=keypad.getKey();

        if ((TECLA3c && (TECLA3c=='1' || TECLA3c=='2' || TECLA3c=='3' || TECLA3c=='4' ||
TECLA3c=='5' || TECLA3c=='6' || TECLA3c=='7' || TECLA3c=='8' || TECLA3c=='9' || TECLA3c=='0'))){

            lcd5.setCursor(12,1);

            lcd5.print('m');

            lcd5.setCursor(15,1);

```

```

    lcd5.print('s');
    CLAVEC[INDICEC]=TECLA3c;
    if (INDICEC<3){
        lcd5.setCursor(INDICEC+9,1);
        lcd5.print(TECLA3c);
    }
    else if (INDICEC>=3 && INDICEC<5){
        lcd5.setCursor(INDICEC+10,1);
        lcd5.print(TECLA3c);
    }
    INDICEC++;
}
}

if (INDICEC>=5){
    VariableObjetivo[0]=CLAVEC[0]; VariableObjetivo[1]=CLAVEC[1];
    VariableObjetivo[2]=CLAVEC[2]; VariableObjetivo[3]=CLAVEC[3]; VariableObjetivo[4]=CLAVEC[4];
    CLAVE2=0;
}

break;

case 'D':
    lcd5.setCursor(0,0);
    lcd5.print("Modo: manual    ");
    lcd5.setCursor(0,1);
    lcd5.print("F: D, T:");
    if (INDICED<5){
        TECLA3d=keypad.getKey();

        if ((TECLA3d && (TECLA3d=='1' || TECLA3d=='2' || TECLA3d=='3' || TECLA3d=='4' ||
TECLA3d=='5' || TECLA3d=='6' || TECLA3d=='7' || TECLA3d=='8' || TECLA3d=='9' ||
TECLA3d=='0'))){

            lcd5.setCursor(12,1);

```

```

    lcd5.print('m');

    lcd5.setCursor(15,1);

    lcd5.print('s');

    CLAVED[INDICED]=TECLA3d;

    if (INDICED<3){

        lcd5.setCursor(INDICED+9,1);

        lcd5.print(TECLA3d);

    }

    else if (INDICED>=3 && INDICED<5){

        lcd5.setCursor(INDICED+10,1);

        lcd5.print(TECLA3d);

    }

    INDICED++;

}

}

if (INDICED>=5){

    VariableObjetivo[0]=CLAVED[0]; VariableObjetivo[1]=CLAVED[1];
VariableObjetivo[2]=CLAVED[2]; VariableObjetivo[3]=CLAVED[3]; VariableObjetivo[4]=CLAVED[4];

    CLAVE2=0;

}

break;

default:

    lcd5.setCursor(0,0);

    lcd5.print("Modo: manual    ");

    lcd5.setCursor(0,1);

    lcd5.print("F:          ");

    INDICEA=0;

    INDICEB=0;

    INDICEC=0;

```

```
        INDICED=0;
        break;
    }
}
else{
    lcd5.setCursor(8,1);
    lcd5.print("Incorrecto");
    INDICE=0;
}
}
}

minutos[0]=VariableObjetivo[0];minutos[1]=VariableObjetivo[1];minutos[2]=VariableObjetivo[2];
segundos[0]=VariableObjetivo[3];segundos[1]=VariableObjetivo[4];
valueminutos=atol(minutos);
valuesegundos=atol(segundos);
valuetotal=valueminutos*60+valuesegundos;
Serial.println(valuetotal);
}
```