INTRODUCCIÓN A LOS MICROCONTOLADORES

HERNÁNDEZ GARCÍA EVA NATALIA

RUIZ ASTORGA ALBERTO ALEJANDRO

"LCD"

GRUPO: 3CM10

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1 | Diagramas

2 | Código

```
.include"m8535def.inc"
.def d=r16

main:

222 ldi d,low (RAMEND)
    out spl, d

    ldi d, high (RAMEND)
    out sph, d

    ser d

    out ddrd, d
    out ddra, d

//Configuracion incial LCD

    ldi d, $30
    out porta, d
    ldi d, $04
    out portd, d
    rcall delay
    ldi d, $00
    out portd, d

    ldi d, $04
    out portd, d
    rcall delay
    ldi d, $00
    out portd, d

    ldi d, $04
    out portd, d
    rcall delay
    ldi d, $00
    out portd, d

    ldi d, $20
    out porta, d
    ldi d, $04
    out portd, d
    rcall delay
    ldi d, $00
    out portd, d

    ldi d, $04
    out portd, d
    rcall delay
    ldi d, $00
    out portd, d


    ldi d, $10
    out porta, d
    ldi d, $04
    out portd, d
    rcall delay
    ldi d, $00
    out portd, d

    ldi d, $00
    out porta, d
    ldi d, $04
    out portd, d
    rcall delay
    ldi d, $00
    out portd, d

    ldi d, $F0
    out porta, d
    ldi d, $04
    out portd, d
    rcall delay
    ldi d, $00
    out portd, d

    ldi d, $01
    out portd, d

        rcall H
        rcall o
        rcall l
        rcall a
```

```
    ldi d, $00
    out portd, d

//Configuramos para la segunda linea

    ldi d, $20
    out porta, d
    ldi d, $04
    out portd, d
    rcall delay
    ldi d, $00
    out portd, d


    ldi d, $C0
    out porta, d
    ldi d, $04
    out portd, d
    rcall delay
    ldi d, $00
    out portd, d

    ldi d, $04
    out portd, d
    rcall delay
    ldi d, $00
    out portd, d


    ldi d, $00
    out porta, d
    ldi d, $04
    out portd, d
    rcall delay
    ldi d, $00
    out portd, d

    ldi d, $01
    out portd, d

        rcall H
        rcall e
        rcall l
        rcall l
        rcall o


uno:

rjmp uno


delay:

;Dura 1 ms
        ldi   r23, 2
        ldi   r22, 70
    L01: dec   r22
        brne L01
        dec   r23
        brne L01
ret
```

```
H:                      o:                      l:                      a:                      e:

        ldi d, $40              ldi d, $60              ldi d, $70              ldi d, $60              ldi d, $60
        out porta, d            out porta, d            out porta, d            out porta, d            out porta, d
        rcall delay             rcall delay             rcall delay             rcall delay             rcall delay
        ldi d, $05              ldi d, $05              ldi d, $05              ldi d, $05              ldi d, $05
        out portd, d            out portd, d            out portd, d            out portd, d            out portd, d
        rcall delay             rcall delay             rcall delay             rcall delay             rcall delay
        ldi d, $01              ldi d, $01              ldi d, $01              ldi d, $01              ldi d, $01
        out portd, d            out portd, d            out portd, d            out portd, d            out portd, d


        ldi d, $80              ldi d, $F0              ldi d, $C0              ldi d, $10              ldi d, $50
        out porta, d            out porta, d            out porta, d            out porta, d            out porta, d
        rcall delay             rcall delay             rcall delay             rcall delay             rcall delay
        ldi d, $05              ldi d, $05              ldi d, $05              ldi d, $05              ldi d, $05
        out portd, d            out portd, d            out portd, d            out portd, d            out portd, d
        rcall delay             rcall delay             rcall delay             rcall delay             rcall delay
        ldi d, $01              ldi d, $01              ldi d, $01              ldi d, $01              ldi d, $01
        out portd, d            out portd, d            out portd, d            out portd, d            out portd, d

    ret                     ret                     ret                     ret                     ret
```