


```

    out = tmp << 4; //Lower
    PORTB = (out | Da);
    _delay_us (100);
    PORTB = (out | En | Da);
    _delay_us (100);
    PORTB = (out | Da);
    _delay_us (50);
}

void SeCu (unsigned char addr) //Send cursor to a specific address (0-80)
{
    WrIn (0b10000000 | addr);
}

void TypeLogo (unsigned char logo2[]) //Logo routine
{
    for (i2 = 0; i2 < 80; i2++) //Send logo
        WrDa (logo2[i2]);
}

void InitLCD (void) //Start up, initialization routine
{
    PORTB = 0;
    out = 0b00110000;
    _delay_ms (20); //Power on _delay_ms 20ms

    PORTB = out;
    _delay_us (100);
    PORTB = (out | En); //Init
    _delay_us (100);
    PORTB = out;
    _delay_ms (5);

    PORTB = (out | En); //Init
    _delay_us (100);
    PORTB = out;
    _delay_us (200);

    PORTB = (out | En); //Init
    _delay_us (100);
    PORTB = out;
    _delay_ms (5);

    out = 0b00100000; //4 bit interface
    PORTB = out;
    _delay_us (100);
    PORTB = (out | En);
    _delay_us (100);
    PORTB = out;
    _delay_us (50);

    WrIn (0b00101000); //4 bit, 2 lines, 5x8 (LCD)
}

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    WrIn (0b00001110);           //Display on, cursor on, blinking off (LCD)

    WrIn (0b00000110);         //Cursor increase, display not shift (LCD)

    WrIn (CDRS);               //Clear display, reset cursor (LCD)
    _delay_ms (2);

    TypeLogo (logo);
}

void Keyb (void)               //Keyboard routine
{
    key = 1;
    for (i1 = 0; i1 < 4; i1++)
    {
        PORTA = ~key;
        key = key << 1;
        while (PINA < 0b11101111)
        {
            _delay_ms (5);
            switch (PINA)
            {
                case 0b11101110:           //Button 1 pressed
                    WrDa ('1');
                    while (PINA == 0b11101110); //Wait if button is still pressed
                    break;

                case 0b11101101:         //Button 4 pressed
                    WrDa ('4');
                    while (PINA == 0b11101101); //Wait if button is still pressed
                    break;

                case 0b11101011:         //Button 7 pressed
                    WrDa ('7');
                    while (PINA == 0b11101011); //Wait if button is still pressed
                    break;

                case 0b11100111:         //Button * pressed
                    WrDa (*);
                    while (PINA == 0b11100111); //Wait if button is still pressed
                    break;

                case 0b11011110:         //Button 2 pressed
                    WrDa ('2');
                    while (PINA == 0b11011110); //Wait if button is still pressed
                    break;

                case 0b11011101:         //Button 5 pressed
                    WrDa ('5');
                    while (PINA == 0b11011101); //Wait if button is still pressed
                    break;

                case 0b11011011:         //Button 8 pressed

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    WrDa ('8');
    while (PINA == 0b11011011); //Wait if button is still pressed
    break;

    case 0b11010111: //Button 0 pressed
    WrDa ('0');
    while (PINA == 0b11010111); //Wait if button is still pressed
    break;

    case 0b10111110: //Button 3 pressed
    WrDa ('3');
    while (PINA == 0b10111110); //Wait if button is still pressed
    break;

    case 0b10111101: //Button 6 pressed
    WrDa ('6');
    while (PINA == 0b10111101); //Wait if button is still pressed
    break;

    case 0b10111011: //Button 9 pressed
    WrDa ('9');
    while (PINA == 0b10111011); //Wait if button is still pressed
    break;

    case 0b10110111: //Button # pressed
    WrDa ('#');
    while (PINA == 0b10110111); //Wait if button is still pressed
    break;

    case 0b01111110: //Button A pressed

    WrDa ('A');
    while (PINA == 0b01111110); //Wait if button is still pressed
    break;

    case 0b01111101: //Button B pressed

    WrDa ('B');
    while (PINA == 0b01111101); //Wait if button is still pressed
    break;

    case 0b01111011: //Button C pressed

    WrDa ('C');
    while (PINA == 0b01111011); //Wait if button is still pressed
    break;

    case 0b01110111: //Button D pressed

    WrDa ('D');
    while (PINA == 0b01110111); //Wait if button is still pressed
    break;
}

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}  
}  
}
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void Buttons (void)
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{  
    while ( (PINC == 0b11111110) || //Check buttons 0 - 7  
            (PINC == 0b11111101) ||  
            (PINC == 0b11111011) ||  
            (PINC == 0b11110111) ||  
            (PINC == 0b11101111) ||  
            (PINC == 0b11011111) ||  
            (PINC == 0b10111111) ||  
            (PINC == 0b01111111) )  
    {  
        _delay_ms (5);  
        switch (PINC)  
        {  
            case 0b01111111: //Button 0 pressed  
                i3++;  
                WrDa (i3);  
                _delay_ms (300);  
                Wrln (CurL); //Shift cursor left  
                break;  
  
            case 0b10111111: //Button 1 pressed  
                i3--;  
                WrDa (i3);  
                _delay_ms (300);  
                Wrln (CurL); //Shift cursor left  
                break;  
  
            case 0b11011111: //Button 2 pressed  
                Wrln (CDRS); //Clear display, reset cursor  
                _delay_ms (2);  
                TypeLogo (logo); //Send logo  
                while (PINC == 0b11011111); //Wait if button is still pressed  
                break;  
  
            case 0b11101111: //Button 3 pressed  
  
                Wrln (DisR); //Shift display right  
                while (PINC == 0b11101111); //Wait if button is still pressed  
                break;  
  
            case 0b11110111: //Button 4 pressed  
                Wrln (DisL); //Shift display left  
                while (PINC == 0b11110111); //Wait if button is still pressed  
                break;  
  
            case 0b11111011: //Button 5 pressed  
                Wrln (CurR); //Shift cursor right  
                while (PINC == 0b11111011); //Wait if button is still pressed
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break;

case 0b11111101:           //Button 6 pressed
  Writeln (CurL);        //Shift cursor left
  while (PINC == 0b11111101); //Wait if button is still pressed
  break;

case 0b11111110:           //Button 7 pressed
  Writeln (CDRS);         //Clear display, reset cursor
  _delay_ms (2);
  while (PINC == 0b11111110); //Wait if button is still pressed
  break;
}
}
}
```