<CODE-LCD->VFD display>:

```
// Program to operate a CU20045-UW5A noritake itron display
//Modified eg 12.5, 8-pin mode single portB
// Mazidi-AVR Microcontrollerss

#define F_CPU 8000000UL

#include <avr/io.h>
#include <util/delay.h>

#define       LCD_DPRT  PORTB      // does NOT work with port A
#define       LCD_DDDR  DDRB       // ONLY with all B or C or a
#define       LCD_DPIN  PINB       // combination of the two!!!
#define       LCD_CPRT  PORTB
#define       LCD_CDDR  DDRB
#define       LCD_CPIN  PINB
#define       LCD_RS  0
#define       LCD_RW  1
#define       LCD_EN  2

//*********************************************************
void delay_us(unsigned int d)
{
       _delay_us(d);
}

//*********************************************************
void lcdCommand( unsigned char cmnd )
{
       LCD_DPRT = cmnd;
       LCD_CPRT &= ~ (1<<LCD_RS);
       LCD_CPRT &= ~ (1<<LCD_RW);
       LCD_CPRT |= (1<<LCD_EN);
       delay_us(1);
       LCD_CPRT &= ~ (1<<LCD_EN);
       delay_us(100);
}

//*********************************************************
void lcdData( unsigned char data )
{
       LCD_DPRT = data;
       LCD_CPRT |= (1<<LCD_RS);
       LCD_CPRT &= ~ (1<<LCD_RW);
       LCD_CPRT |= (1<<LCD_EN);
       delay_us(1);
       LCD_CPRT &= ~ (1<<LCD_EN);
       delay_us(100);
}

//*********************************************************
void lcd_init()
{
       LCD_DDDR = 0xFF;
       LCD_CDDR = 0xFF;

       LCD_CPRT &=~(1<<LCD_EN);
       delay_us(2000);
       lcdCommand(0x38);
       lcdCommand(0x0E);
       lcdCommand(0x01);
       delay_us(2000);
       lcdCommand(0x06);
}
```

```
//*****************************************************
void lcd_gotoxy(unsigned char x, unsigned char y)
{
	unsigned char firstCharAdr[]={0x80,0xC0,0x94,0xD4};//table 12-5
	lcdCommand(firstCharAdr[y-1] + x - 1);
	delay_us(100);
}

//*****************************************************
void lcd_print( char * str )
{
	unsigned char i = 0 ;
	while(str[i]!=0)
	{
		lcdData(str[i]);
		i++ ;
	}
}

//*****************************************************
int main(void)
{
	lcd_init();
	lcd_gotoxy(1,1);
	lcd_print("The world is but");
	lcd_gotoxy(1,2);
	lcd_print("one country");

	while(1);
	return 0;
}
```

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