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/*
 * Test Task 1.c
 *
 * Created: 01-Nov-19 10:29:52 AM
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 */
#define F_CPU 16000000UL //defines the frequency of the CPU

//include standard libraries
#include <stdio.h>
#include <avr/io.h>
#include <util/delay.h>

//include user libraries
#include "i2cmaster.h"
#include "usart.h" //to output to realterm or sdu terminal

void turn_right(void);
void turn_left(void);
void go(void);
void reverse(void);
void stop(void);
void steppermotor(int);

int main(void)
{
    //configuring buttons
    DDRB = 0xFF; //configure port b as output port
    PORTB = 0x00; //output 0 on port b
    DDRD = 0xFF; //configure port b as output port
    PORTD = 0x00; //output 0 on port b

    i2c_init(); //initialize the communication for I2C
    uart_init();
    io_redirect();

    go; //starts motor goes straight
    _delay_ms(10000); //motor run time (10 sec)
    stop; //stop motor

    turn_right; //turns front wheel to the right

    go; //starts motor - goes right
    _delay_ms(3000); //motor run time (3 sec)
    stop; //stops motor

    turn_left; //turns front wheel straight

    go; //starts motor - goes straight
    _delay_ms(10000); //motor run time (10 sec)
    stop; //stop motor
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    turn_left;                                //turns front wheel left

    go;                                        //starts motor - goes left
    _delay_ms(3000);                          //motor run time (3 sec)
    stop;                                     //stop motor

    turn_right;                              //turns front wheel straight

    go;                                        //starts motor - goes straight
    _delay_ms(10000);                        //motor run time (10 sec)
    stop;                                     //stop motor

    reverse;                                  //motor reverses
    _delay_ms(10000);                        //motor run time (10 sec)
    stop;                                     //stop motor

    return 0;
}

void go (void){
    PORTD=PORTD|0b00001000;                  //sets pwm output pin to 1
    PORTD=PORTD|0b00000100;                  //sets pin d2 to 1
    PORTD=PORTD&0b11101111;                 //sets pin d4 to 0
}

void reverse (void){
    PORTD=PORTD|0b00001000;                  //sets pwm output pin to 1
    PORTD=PORTD|0b00010000;                  //sets pin d4 to 1
    PORTD=PORTD&0b11110111;                 //sets pin d2 to 0
}

void stop (void){
    PORTD=PORTD&0b11100011;                  //sets pwm output pin, d2, d4 to 0
}

void turn_right (void){
    PORTB=0b00000011;                        //AIN1, BIN1 high
    steppermotor(150);                       //starts pwm to stepper motor
    PORTB=0b00010000;                        //h-bridge standby
}

void turn_left (void){
    PORTB=0b00001100;                        //AIN2, BIN2 high
    steppermotor(150);                       //starts pwm to stepper motor
    PORTB=0b00010000;                        //h-bridge standby
}

void steppermotor(int time){
    PORTD=PORTD&0b10011111;                  //sets pins d5 & d6 to 0
    //PORTD=PORTD|0b01000000;                //sets pin d6 to 1
    for (int i=0; i<time; i++){              //for loop will repeat 'time' times

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    PORTD=PORTD|0b01100000;    //sets pins d5 and d6 to high
    _delay_us(1);
    PORTD=PORTD&0b10111111;    //sets pin d6 to 0
    _delay_us(1);
    PORTD=PORTD|0b01100000;    //sets pins d5, d6 to high
    _delay_us(1);
    PORTD=PORTD&0b11011111;    //sets pin d5 to 0
    _delay_us(1);
}
PORTD=PORTD&0b10011111;
}
```