과제 2 소스코드

```
#define F_CPU 16000000
#include <avr/io.h>
#include <avr/interrupt.h>
#include <util/delay.h>
#include "LCD_Text.h"

void Uart_Putch(unsigned char Putdata);
void Driving_AX(unsigned char id, unsigned int position, unsigned int spd);
void UART0_init();
void UART0_transmit(char data);
char UART0_receive();

int main()
{
	UART0_init();
	UBRR0L = 103;
	UBRR0H = 0;
	UCSR0A = 0x20;
	UCSR0B = 0x18;
	UCSR0C = 0x06;
	DDRF = 0x00;
	ADMUX = 0x40;
	ADCSRA = 0x87;
	DDRA = 0xFF;
```

```
	DDRD = 0x00;
	lcdInit();
	lcdClear();
	DDRE = 0x02;

	while(1)
	{
		unsigned int adcValue = 0;
		unsigned char channel = 0x00;
		ADMUX = 0x40 | channel;
		ADCSRA |= 0x40;
		while((ADCSRA & 0x10) == 0);
		{
			adcValue = ADC;
			_delay_ms(100);
		}
		int _spd;
		_spd = UART0_receive() / 9 * 300;
		Driving_AX(100, adcValue, _spd);
		lcdNumber(0, 0, _spd);
		lcdNumber(1, 0, adcValue);
	}
}

void Uart_Putch(unsigned char Putdata)
```

```
{
        while (!(UCSR0A & (1 << UDRE0)));
        UDR0 = Putdata;
}

void Driving_AX(unsigned char id, unsigned int position, unsigned int spd)
{
        unsigned char i;
        unsigned char Pos_L, Pos_H, Spd_L, Spd_H;
        unsigned char txbuf[11];

        Pos_L = position & 0xFF;
        Pos_H = (position >> 8) & 0xFF;
        Spd_L = spd & 0xFF;
        Spd_H = (spd >> 8) & 0xFF;

        txbuf[0] = 0xFF;
        txbuf[1] = 0xFF;
        txbuf[2] = id;
        txbuf[3] = 7;
        txbuf[4] = 3;
        txbuf[5] = 30;
        txbuf[6] = Pos_L;
        txbuf[7] = Pos_H;
        txbuf[8] = Spd_L;
```

```
		txbuf[9] = Spd_H;


		txbuf[10] = 0;
		for (i = 2; i < 10; i++)
		txbuf[10] += txbuf[i];
		txbuf[10] = ~txbuf[10];


		for (i = 0; i < 11; i++)
		{
			Uart_Putch(txbuf[i]);
			_delay_ms(1);
		}
}

void UART0_init()
{
		UBRR0H = 0x00;
		UBRR0L = 103;
		UCSR0A |= 0x20;
		UCSR0B |= 0x18;
		UCSR0C |= 0x06;
		DDRE |= 0x02;
}

char UART0_receive()
```

```
{
        while (!(UCSR0A & (1 << RXC0)));
        return UDR0;
}

void UART0_transmit(char data)
{
        while (!(UCSR0A & (1 << UDRE0)));
        UDR0 = data;
}
```

과제 3 소스코드

```
#define F_CPU 16000000
#include <avr/io.h>
#include <avr/interrupt.h>
#include <util/delay.h>

void Driving_AX(unsigned char id, unsigned int position, unsigned int spd);
void UART0_init();
void UART0_transmit(char data);
char UART0_receive();

int main()
{
        UART0_init();
        UBRR0L = 103;
```

```
	UBRR0H = 0;
	UCSR0A = 0x20;
	UCSR0B = 0x18;
	UCSR0C = 0x06;
	int pos,spd;
	while(1)
	{
		UART0_transmit('p');
		UART0_transmit('o');
		UART0_transmit('s');
		pos = UART0_receive();
		UART0_transmit('s');
		UART0_transmit('p');
		UART0_transmit('d');
		spd = UART0_receive();
		Driving_AX(100,pos,spd);
	}
}

void Driving_AX(unsigned char id, unsigned int position, unsigned int spd)
{
	unsigned char i;
	unsigned char Pos_L, Pos_H, Spd_L, Spd_H;
	unsigned char txbuf[11];
```

```
Pos_L = position & 0xFF;
Pos_H = (position >> 8) & 0xFF;
Spd_L = spd & 0xFF;
Spd_H = (spd >> 8) & 0xFF;

txbuf[0] = 0xFF;
txbuf[1] = 0xFF;
txbuf[2] = id;
txbuf[3] = 7;
txbuf[4] = 3;
txbuf[5] = 30;
txbuf[6] = Pos_L;
txbuf[7] = Pos_H;
txbuf[8] = Spd_L;
txbuf[9] = Spd_H;

txbuf[10] = 0;
for (i = 2; i < 10; i++)
txbuf[10] += txbuf[i];
txbuf[10] = ~txbuf[10];

for (i = 0; i < 11; i++)
{
        UART0_transmit(txbuf[i]);
        _delay_ms(1);
```

```
        }
}

void UART0_init()
{
        UBRR0H = 0x00;
        UBRR0L = 103;
        UCSR0A |= 0x20;
        UCSR0B |= 0x18;
        UCSR0C |= 0x06;
        DDRE |= 0x02;
}

char UART0_receive()
{
        while (!(UCSR0A & (1 << RXC0)));
        return UDR0;
}

void UART0_transmit(char data)
{
        while (!(UCSR0A & (1 << UDRE0)));
        UDR0 = data;
}
```

12v 꽂다가 아트메가를 날려먹어서 uart가 안되는 아트메가를 임시로 받았습니다. Uart가 작동을 안해서 코드를 실행해 볼수가 없네요ㅠㅠ 아트메가 새로 받게되면 실행결과와 함께 새로 내겠습니다