CMPE 443 PRINCIPLES OF EMBEDDED SYSTEMS DESIGN

PRELAB #010 "UART"

1) Problem Definition

In this prelab, you will use a potentiometer and serial communication. You can use your PRELAB9 code for getting the ADC values. You will send the ADC values to the PC (with the "\r\n") at every 500ms. You will use interrupt for UART.

You can use various programs for showing the serial communication output. You can use Putty or a different alternative which is suitable for your OS.

https://www.cyberciti.biz/hardware/5-linux-unix-commands-for-connecting-to-the-serial-console/

Serial Communication configuration:

- 9600 Baud
- 8 Data Bits
- 1 Bit Stop
- No Parity

2) UART

- Which UART is connected to STM32 USB Virtual COM Port (VCP)? LPUART1
- Which pins are TX/RX?

- TX —- PG7

- RX —- PG8

- Enable Clock for Power Interface

```
//Enable Clock for Power Interface
RCC_APB1ENR |= 1<<28;
```

- Change the regulator mode to Low-power mode

```
//Change the regulator mode to Low-power mode
PWR_CR1 |= 1<<14;
```

- Make VDDIO2 valid

```
//Make VDDIO2 valid
PWR_CR2|= 1<<9;
```

- Change the clock source of Low-power UART to SYSCLK

```
//Change the clock source of Low-power UART to SYSCLK
RCC_CCIPR1 |= (1<<10);
```

- Enable Clock for Low-power UART

```
//Enable Clock for Low-power UART
RCC_APB1ENR2 |= 1;
```

- Enable Clock for GPIO

```
//Enable Clock for GPIO
RCC_AHB2ENR |= 1<<6;
```

- Change the functionality of the pin

```
//Change the functionality of the pin
GPIOG->MODER |= 1<<15;
GPIOG->MODER &= ~(1<<14);
GPIOG->AFRL |=  (1<<31);
```

- Change LPUART baud rate (BRR) for 9600 Baud rate

```
LPUART_BRR = 106666;
```

-
- Enable FIFO mode for UART

```
//Enable FIFO mode for UART
LPUART_CR1 |= 1<<29;
```

- Enable Transmitter and Receiver for UART

```
//Enable Transmitter and Receiver for UART
LPUART_CR1 |= 1<<2;
LPUART_CR1 |= 1<<3;
```

- Enable Interrupt and LPUART

```
//Enable Interrupt and LPUART
NVIC_ISER2 |= 1<<2;
LPUART_CR1 |= 1;
LPUART_CR1 |= 1<<6;
```

3) Code

In this prelab, you need to write code as described at the problem definition.

4) Submission

You will submit one zip file which contains this document and your project (all the files with the last configuration)

The naming of the zip file should be:

PRELAB<exp num>_<StudentID>.zip

5) Related Videos and Links

UART:

https://www.youtube.com/watch?v=EqMF-aEyLgQ