Assignment 2

Introduction

Assignment 2 focuses on the application of UART and Interrupt.

Students should be able to achieve:

- DR16 reception and decoding
- Transmission of decoded data
- Optimization of the reception logic

Requirements and Grading Policies

Pre-requisites

- Use STM32CubeMX to configure UART peripherals and generate the code for the assignment.
  You need to demonstrate the code generation for us.

Primary (70%)

- Receive DR16 data (30%)
  - Using interrupt (5%)
- Decode DR16 data (25%)
  - On *reception complete* callback (5%)
- DR16 data reception and decoding rate at maximum period around 14ms (5%)
  (i.e. Little loss of data)
  Not available when unable to receive or decode data

Secondary (only if primary goals are fully realized) (30%)

- Data validation and verification (8%)
- Show the DR16 connection state(7%)
- Automatically start/continue DR16 reception when DR16 is connected (6%)
- Disconnection handling (e.g. reset decoded data) (4%)
- Transmit decode data to host PC consecutively via UART-MicroUSB port, following the required format and UART parameters (4%)
  - Exactly matched reception of DR16 data (1%)

DR16 UART Parameters:

- Baud rate: **100000** Bits/s
- Data Length: **8** Bits
- Parity: **Even**
- Stop Bits: **1**

Host Communication Format & UART Parameters (Micro-USB Port)

Format

- All decoded results in one message
- One line for one field
- Each value of field are transformed from number to text, with name of the field

You are recommended to use `sprintf` function to get a formatted string

Parameters

- Baud rate: **115200** Bits/s
- Data Length: **8** Bits
- Parity bit: **None**
- Stop Bit: **1**

Submission

Task

The submission of your work is divided into two parts.

1. Zip your code (Delete the build directory) and **submit it on Canvas**.
2. You **have to demo your work** offline to any senior at our Lab in Hall 8. **We only count your best try (under different codes) and we encourage you to keep improving your work**

Demo time arrangement:

Generally available from **18:30 to 23:30** *(Monday to Friday)*; **12:30 to 23:30** *(Saturday and Sunday)*

In case you want to demo your work at other times, please contact SW TAs in advance. Otherwise, **we do not guarantee there are people in our lab**.

Deadline

The deadline for your **final** submission is 11:59 p.m., October 16, Monday.