Group 18 Code Reference Document

The following functions are used in the firmware for Group 18's HAT. Please note that the bulk of this code is taken from the Coding Help slides by Jane Wyngaard[1]:

Function name	**debugPrintln**
Function description	General purpose Function to send a char array over the UART and to automatically send a new line character after it
Parameters	**uart_handle**: pointer to a UART_HandleTypeDef structure that contains the configuration information for the UART being used **_out[ ]** : array of characters to be sent
Return values	None
Function name	**demoDataTransfer**
Function description	Demonstration of sending data over UART to laptop. "Hello, this is STMF0 Discovery board" should be printed to the laptop and the blue LED should be flashed once this is completed
Parameters	None
Return values	None
Function name	**checkAddress**
Function description	This function checks that the correct address has been chosen
Parameters	**huart**: pointer to a UART_HandleTypeDef structure that contains the configuration information for the UART being used All other parameters are used to call the HAL_I2C_IsDeviceReady function. Thus, the following is copied from the HAL reference sheet[2]: **hi2c**: Pointer to a I2C_HandleTypeDef structure that contains the configuration information for the specified I2C. **DevAddress**: Target device address: The device 7 bits address value in datasheet must be shift at right before call interface **Trials**: Number of trials **Timeout**: Timeout duration
Return values	None
Function name	**writeToI2C**
Function description	This function is used to read data from the EEPROM
Parameters	**EEPROM_DEVICE_ADDR**: pointer to the address of the EEPROM device on the I2C bus **madd**: starting memory address for the location of memory to read from **Data**: starting value of data to write to memory
Return values	None
Function name	**readToI2C**

Function description	This function is used to write data to the EEPROM
Parameters	**EEPROM_DEVICE_ADDR**: pointer to the address of the EEPROM device on the I2C bus **madd**: starting memory address for the location of memory to read from **Result**: address of stored value to read back from memory in
Return values	None
Function name	**lightSensingInit**
Function description	Blink 2 LEDs based on the output of the LDRs from the HAT
Parameters	None
Return values	None

[1] J. Wyngaard, *Coding Help*. 2022, pp. 1-16.

[2] STMicroelectronics, *Description of STM32F0 HAL and low-layer drivers*. STMicroelectronics, 2022, pp. 217-218.