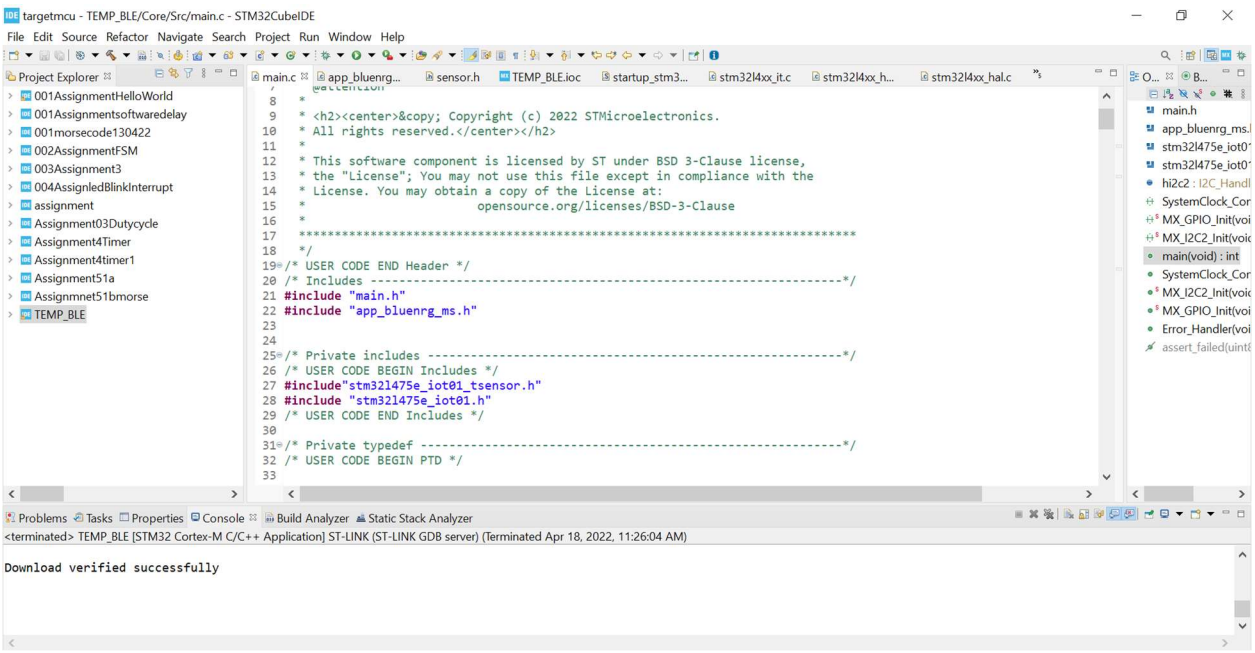
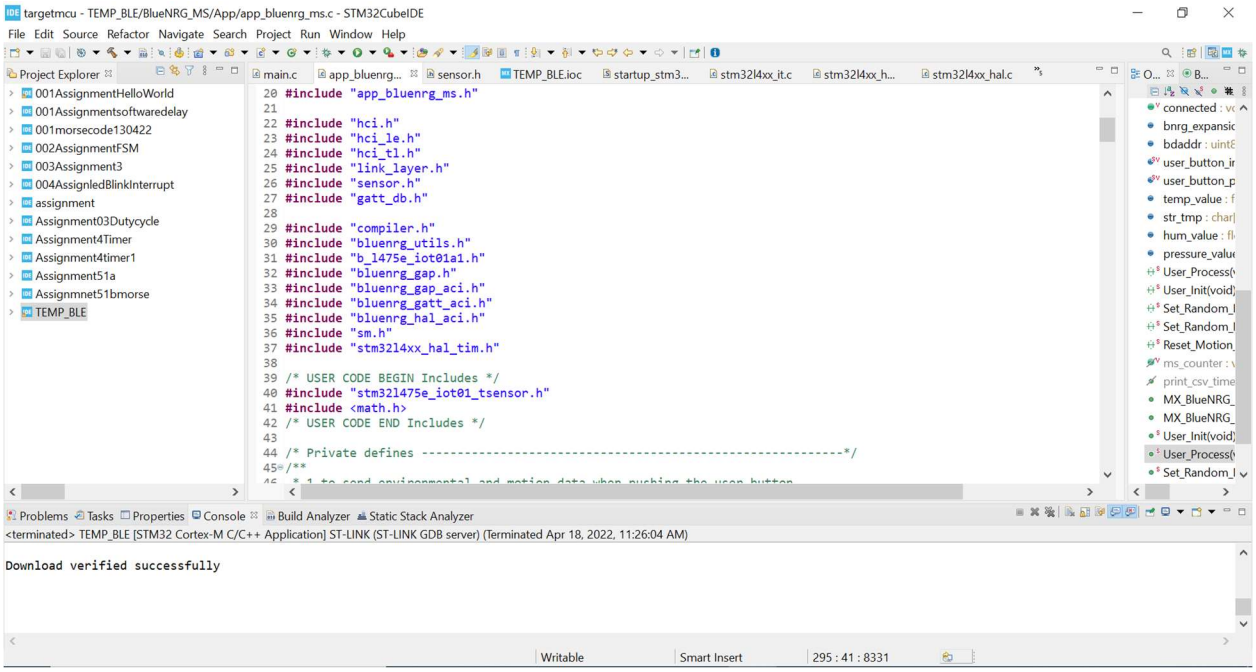
ASSIGNMENT – 06

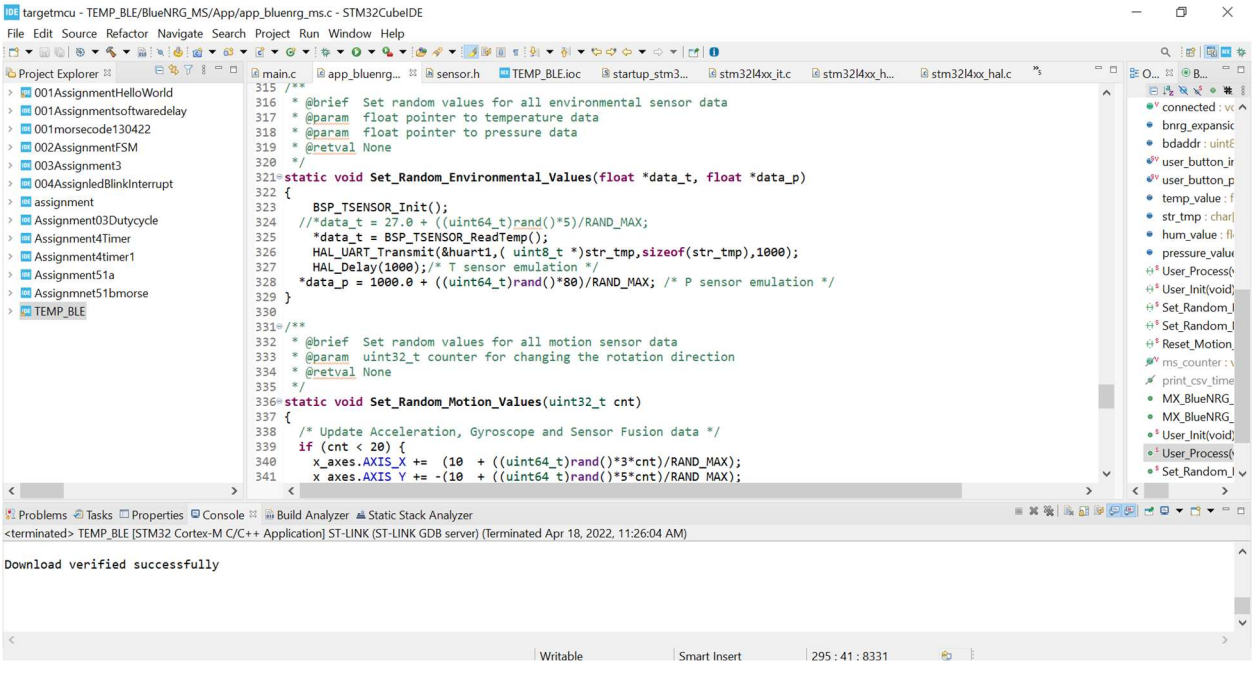
Exercise 1 gives you all necessary API so that you start receiving all simulated sensor data on ST BLE Sensor App. Make change in the program so that it can send actual HTS221 temperature sensor data rather than simulated data. Hind: Include necessary driver files as mentioned in Lab7T1. Add necessary API/helper function in app_bluenrg_ms.c

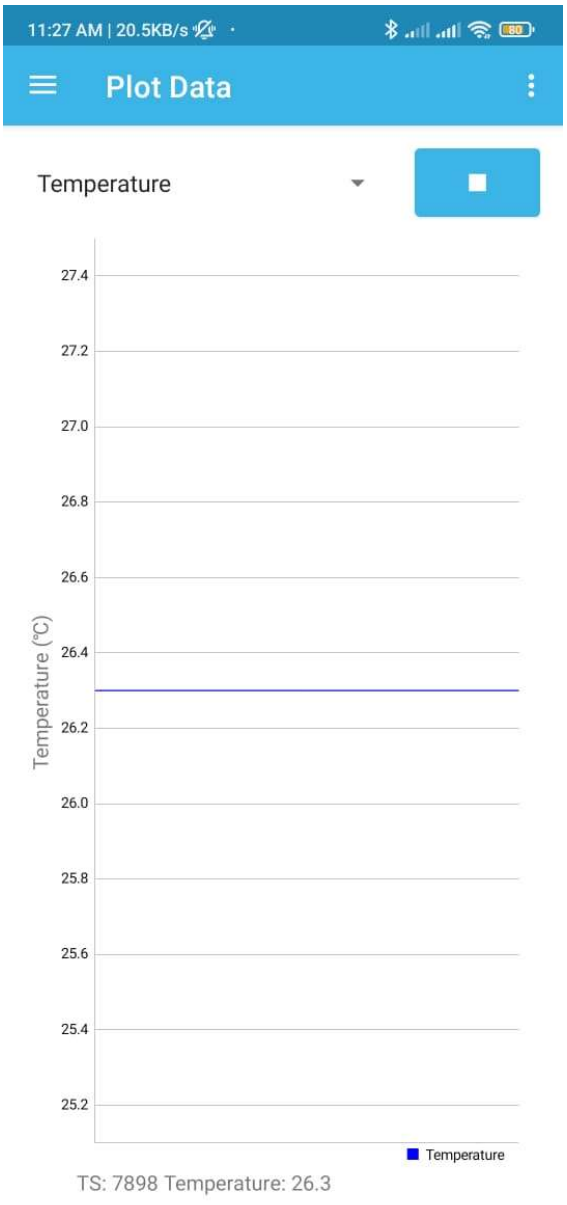
CODE:

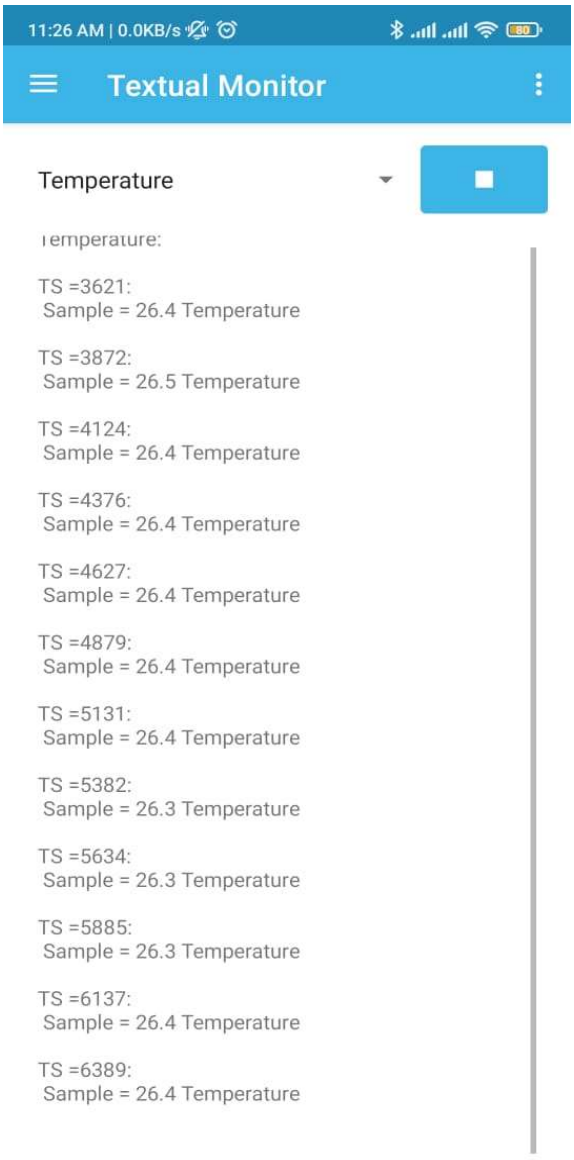
```
static void Set_Random_Environmental_Values(float *data_t, float *data_p)
{
	BSP_TSENSOR_Init();
  //*data_t = 27.0 + ((uint64_t)rand()*5)/RAND_MAX;
	*data_t = BSP_TSENSOR_ReadTemp();
	HAL_UART_Transmit(&huart1,( uint8_t *)str_tmp,sizeof(str_tmp),1000);
	HAL_Delay(1000);/* T sensor emulation */
  *data_p = 1000.0 + ((uint64_t)rand()*80)/RAND_MAX; /* P sensor emulation */
}
```




targetmcu - TEMP_BLE/BlueNRG_MS/App/app_bluenrg_ms.c - STM32CubeIDE
File Edit Source Refactor Navigate Search Project Run Window Help
Project Explorer
001AssignmentHelloWorld
001Assignmentsoftwaredelay
001morsecode130422
002AssignmentFSM
003Assignment3
004AssignledBlinkInterrupt
assignment
Assignment03Dutycycle
Assignment4Timer
Assignment4timer1
Assignment51a
Assignmnet51bmorse
TEMP_BLE
main.c
app_bluenrg...
sensor.h
TEMP_BLE.ioc
startup_stm3...
stm32l4xx_it.c
stm32l4xx_h...
stm32l4xx_hal.c
20 #include "app_bluenrg_ms.h"
22 #include "hci.h"
23 #include "hci_le.h"
24 #include "hci_tl.h"
25 #include "link_layer.h"
26 #include "sensor.h"
27 #include "gatt_db.h"
29 #include "compiler.h"
30 #include "bluenrg_utils.h"
31 #include "b_l475e_iot01a1.h"
32 #include "bluenrg_gap.h"
33 #include "bluenrg_gap_aci.h"
34 #include "bluenrg_gatt_aci.h"
35 #include "bluenrg_hal_aci.h"
36 #include "sm.h"
37 #include "stm32l4xx_hal_tim.h"
39 /* USER CODE BEGIN Includes */
40 #include "stm32l475e_iot01_tsensor.h"
41 #include <math.h>
42 /* USER CODE END Includes */
44 /* Private defines ---*/
Problems Tasks Properties Console Build Analyzer Static Stack Analyzer
<terminated> TEMP_BLE [STM32 Cortex-M C/C++ Application] ST-LINK (ST-LINK GDB server) (Terminated Apr 18, 2022, 11:26:04 AM)
Download verified successfully
Writable
Smart Insert
295 : 41 : 8331


targetmcu - TEMP_BLE/BlueNRG_MS/App/app_bluenrg_ms.c - STM32CubeIDE
File Edit Source Refactor Navigate Search Project Run Window Help
Project Explorer
001AssignmentHelloWorld
001Assignmentsoftwaredelay
001morsecode130422
002AssignmentFSM
003Assignment3
004AssignledBlinkInterrupt
assignment
Assignment03Dutycycle
Assignment4Timer
Assignment4timer1
Assignment51a
Assignmnet51bmorse
TEMP_BLE
main.c
app_bluenrg...
sensor.h
TEMP_BLE.ioc
startup_stm3...
stm32l4xx_it.c
stm32l4xx_h...
stm32l4xx_hal.c
315 /**
316 * @brief Set random values for all environmental sensor data
317 * @param float pointer to temperature data
318 * @param float pointer to pressure data
319 * @retval None
320 */
321 static void Set_Random_Environmental_Values(float *data_t, float *data_p)
322 {
323 BSP_TSENSOR_Init();
324 //*data_t = 27.0 + ((uint64_t)rand()*5)/RAND_MAX;
325 *data_t = BSP_TSENSOR_ReadTemp();
326 HAL_UART_Transmit(&huart1,(uint8_t *)str_tmp,sizeof(str_tmp),1000);
327 HAL_Delay(1000);/* T sensor emulation */
328 *data_p = 1000.0 + ((uint64_t)rand()*80)/RAND_MAX; /* P sensor emulation */
329 }
330
331 /**
332 * @brief Set random values for all motion sensor data
333 * @param uint32_t counter for changing the rotation direction
334 * @retval None
335 */
336 static void Set_Random_Motion_Values(uint32_t cnt)
337 {
338 /* Update Acceleration, Gyroscope and Sensor Fusion data */
339 if (cnt < 20) {
340 x_axes.AXIS_X += (10 + ((uint64_t)rand()*3*cnt)/RAND_MAX);
341 x_axes.AXIS_Y += -(10 + ((uint64_t)rand()*5*cnt)/RAND_MAX);
Problems Tasks Properties Console Build Analyzer Static Stack Analyzer
<terminated> TEMP_BLE [STM32 Cortex-M C/C++ Application] ST-LINK (ST-LINK GDB server) (Terminated Apr 18, 2022, 11:26:04 AM)
Download verified successfully
Writable
Smart Insert
295 : 41 : 8331


11:27 AM | 20.5KB/s
Plot Data
Temperature
27.4
27.2
27.0
26.8
26.6
26.4
26.2
26.0
25.8
25.6
25.4
25.2
Temperature (°C)
Temperature
TS: 7898 Temperature: 26.3


11:26 AM | 0.0KB/s
Textual Monitor
Temperature
Temperature:
TS =3621:
Sample = 26.4 Temperature
TS =3872:
Sample = 26.5 Temperature
TS =4124:
Sample = 26.4 Temperature
TS =4376:
Sample = 26.4 Temperature
TS =4627:
Sample = 26.4 Temperature
TS =4879:
Sample = 26.4 Temperature
TS =5131:
Sample = 26.4 Temperature
TS =5382:
Sample = 26.3 Temperature
TS =5634:
Sample = 26.3 Temperature
TS =5885:
Sample = 26.3 Temperature
TS =6137:
Sample = 26.4 Temperature
TS =6389:
Sample = 26.4 Temperature