CPE477/ECG677 – Embedded Security & Machine Learning

Design Assignment 1

DO NOT REMOVE THIS PAGE DURING SUBMISSION:

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Github Repository link (root): https://github.com/NicolasE04/yeahsure.git

Youtube Playlist link (root): cpe_477

Follow the submission guideline to be awarded points for this Assignment.

Submit the following for all Assignments:

1. In the document, for each task submit the modified or included code (from the base code) with highlights and justifications of the modifications. Also include the comments. If no base code is provided, submit the base code for the first task only.
2. Create a private Github repository with a random name (no CPE477/677, Lastname, Firstname). Place all assignments under the root folder, sub-folder named Assignmentn, with one document and one video link file for each lab, place modified c files named as main.c.
3. If multiple ‘c’ or ‘h’ files or other libraries are used, place these files inside the folder.
4. The folder should have a) Word document (see template), b) source code file(s) with other ‘c’ and ‘h’ include files, c) text file with YouTube video links (see template).
5. Submit the PDF file in Canvas before the due date. The root folder of the github assignment directory should have the documentation and the text file with youtube video links.
6. Organize your youtube videos as playlist under the name “EMBSEC&ML”. The playlist should have the video sequence arranged as submission or due dates.
7. Only submit pdf documents. Do not forget to upload this document in the github repository and in the canvas submission portal.

1. Goal: Explain what is explored in this assignment and what was accomplished.

The goal of this assignment is to set up the IDE and download the right software packages. Once you do that, we want to output the accelerometer, gyro, and magnetic sensor in CSV format.

2. Screenshots of the IDE, physical setup, and debugging process – Provide screenshots of successful compilation, screenshots of graphs, etc.

```
-6,11,999,-70, 210, -210,0,369,0
-7,11,992,0, 0, -140,0,375,0
-6,9,992,140, -280, -140,0,366,0
-12,9,997,70, 140, -210,0,379,0
-8,11,997,0, 140, -210,0,373,0
-8,11,999,0, 140, -140,0,369,0
-8,11,1000,70, 140, -210,0,373,0
-8,12,1000,0, 140, -210,0,378,0
-7,12,1000,0, 210, -210,0,375,0
-9,11,998,0, 70, -210,0,376,0
-10,12,998,0, 70, -210,0,343,0
-7,17,1013,-490, 910, -280,0,349,0
-4,21,1000,0, -70, 0,0,346,0
-7,14,997,-70, 140, -210,0,351,0
```

```
Opening and parsing file: ST-LINK_GDB_server_a65572.srec


Memory Programming ...
  File          : ST-LINK_GDB_server_a65572.srec
  Size          : 42.12 KB
  Address       : 0x08000000


Erasing memory corresponding to segment 0:
Erasing internal memory sectors [0 2]
Download in Progress:


File download complete
Time elapsed during download operation: 00:00:01.108



Verifying...




Time elapsed during verifying operation: 00:00:00.283


Download verified successfully


Shutting down...
Exit.
```

```
CDT Build Console [DataLogTerminal]
20:13:20 **** Incremental Build of configuration Debug for project DataLogTerminal ****
make -j24 all
arm-none-eabi-gcc "C:/Users/Nicol/STM32Cube/Repository/Packs/STMicroelectronics/X-CUBE-MEMS1/11.
C:/Users/Nicol/STM32Cube/Repository/Packs/STMicroelectronics/X-CUBE-MEMS1/11.3.0/Projects/NUCLEO
C:/Users/Nicol/STM32Cube/Repository/Packs/STMicroelectronics/X-CUBE-MEMS1/11.3.0/Projects/NUCLEO
  104 |   displayFloatToInt_t out_value_odr;
      |                       ^~~~~~~~~~~~
C:/Users/Nicol/STM32Cube/Repository/Packs/STMicroelectronics/X-CUBE-MEMS1/11.3.0/Projects/NUCLEO
C:/Users/Nicol/STM32Cube/Repository/Packs/STMicroelectronics/X-CUBE-MEMS1/11.3.0/Projects/NUCLEO
  442 |    snprintf(dataOut, MAX_BUF_SIZE, "%d,%d,%d", (int)Instance,
      |                                     ^~~~~~~~~
C:/Users/Nicol/STM32Cube/Repository/Packs/STMicroelectronics/X-CUBE-MEMS1/11.3.0/Projects/NUCLEO
C:/Users/Nicol/STM32Cube/Repository/Packs/STMicroelectronics/X-CUBE-MEMS1/11.3.0/Projects/NUCLEO
  605 | static void Hum_Sensor_Handler(uint32_t Instance)
      |             ^~~~~~~~~~~~~~~~~~
C:/Users/Nicol/STM32Cube/Repository/Packs/STMicroelectronics/X-CUBE-MEMS1/11.3.0/Projects/NUCLEO
  549 | static void Press_Sensor_Handler(uint32_t Instance)
      |             ^~~~~~~~~~~~~~~~~~~~
C:/Users/Nicol/STM32Cube/Repository/Packs/STMicroelectronics/X-CUBE-MEMS1/11.3.0/Projects/NUCLEO
  492 | static void Temp_Sensor_Handler(uint32_t Instance)
      |             ^~~~~~~~~~~~~~~~~~~
C:/Users/Nicol/STM32Cube/Repository/Packs/STMicroelectronics/X-CUBE-MEMS1/11.3.0/Projects/NUCLEO
   48 | static IKS4A1_ENV_SENSOR_Capabilities_t EnvCapabilities[IKS4A1_ENV_INSTANCES_NBR];
      |                                         ^~~~~~~~~~~~~~
arm-none-eabi-gcc -o "DataLogTerminal.elf" @"objects.list"   -mcpu=cortex-m4 -T"C:\Users\Nicol\S
Finished building target: DataLogTerminal.elf

arm-none-eabi-size  DataLogTerminal.elf
arm-none-eabi-objdump -h -S DataLogTerminal.elf  > "DataLogTerminal.list"
   text    data     bss     dec     hex filename
  42824     292    2548   45664    b260 DataLogTerminal.elf
Finished building: default.size.stdout

Finished building: DataLogTerminal.list


20:13:21 Build Finished. 0 errors, 6 warnings. (took 585ms)
```

```
#define USE_IKS4A1_ENV_SENSOR_SHT40AD1B_0                    1U
#define USE_IKS4A1_ENV_SENSOR_LPS22DF_0                      0U
#define USE_IKS4A1_ENV_SENSOR_STTS22H_0                      0U

#define USE_IKS4A1_MOTION_SENSOR_LSM6DSV16X_0                1U
#define USE_IKS4A1_MOTION_SENSOR_LIS2DUXS12_0                0U
#define USE_IKS4A1_MOTION_SENSOR_LIS2MDL_0                   1U
#define USE_IKS4A1_MOTION_SENSOR_LSM6DSO16IS_0               0U
```

This is from the iks4a1_conf.h, and I turned off these sensors.

3. Declaration

   I understand the Student Academic Misconduct Policy - http://studentconduct.unlv.edu/misconduct/policy.html

"This assignment submission is my own, original work".

Name of the Student