SOFE 4590U
Embedded Systems

Embedded System Assignment 2
Implementation of a pedometer or step counter using STM32F411E-DISCO

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Demo Video:
https://drive.google.com/file/d/1tDdoGxBssUZQIzNvwTXCiUGxn_8DHouJ/view?usp=share_link

The steps used to implement the functionality were following examples given from TA's advice and direct links to certain examples. While the code could be significantly improved as it faulty due to any noise or unwanted readings, the overall pedometer tracking does work when following certain assumptions.

The phases of the pedometer is simply in one of two states. There is a walking state where acceleration change is detected and step counter becomes incremented. After a short delay it will collect more separate readings and then check again. If there is no difference between the readings, the state will then change into the stopped state.

```
stat1 = ((ReadFromAccelerometer(0x29) << 8) | ReadFromAccelerometer(0x28));
HAL_Delay (500);
stat2 = ((ReadFromAccelerometer(0x29) << 8) | ReadFromAccelerometer(0x28));
while (abs(stat1-stat2)!=abs(stat2)){
```

The stopped state will display the stopped line signifying that there was no detected change. It will taking more readings after a certain delay. Once a certain amount of time has passed, more readings will occur and could possibly change the state to walking.

```
stat1 = ((ReadFromAccelerometer(0x29) << 8) | ReadFromAccelerometer(0x28));
HAL_Delay (500);
stat2 = ((ReadFromAccelerometer(0x29) << 8) | ReadFromAccelerometer(0x28));
Lcd_cursor(&lcd,1,0);
Lcd_string(&lcd, "STOPPED");
HAL_Delay (250);
```

Essentially, the while loop acts as the walking state and being outside of that while loop acts as the stopped state. The LCD display changes depending on whether or not the current state is in the while loop.

```
Lcd_cursor(&lcd,1,0);
Lcd_string(&lcd, "WALKING");
```

Both state messages are the same length and will occupy the same exact space.

The code can be found in the following link:
https://drive.google.com/file/d/1yWJcNAS7lilK4QAzaaaGFCqC2dsyo4rj/view?usp=share_link