Day 03: Exercises

Task 03_1_CPP_autoconsole

Create new the project: CPP_autoconsole_03_01.

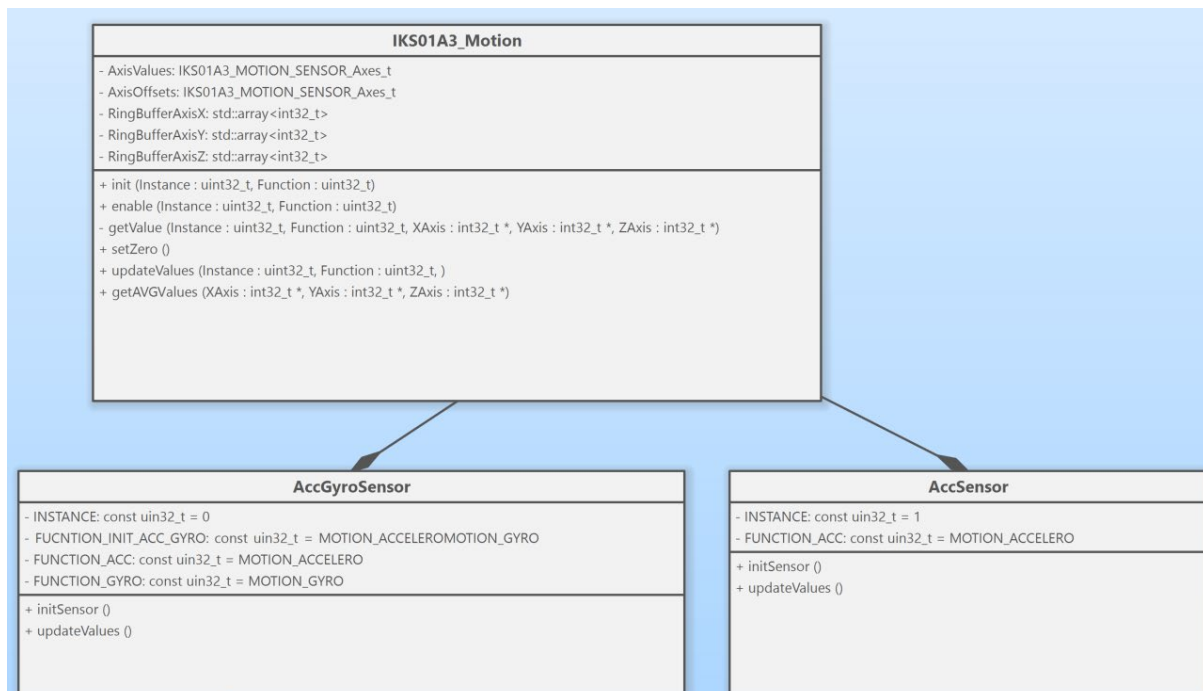Create a variable of type auto an increment it from 0 to 255;

Print the value on the console.

Task 03_2_CPP_IKS01A3

Create new the project: CPP_IKS01A3_03_02.

Implement the classes according to the concept.

Output the values of the acceleration sensor on the console.

Task 03_3_CPP_IKS01A3_ArrayAvg

Extend the project: CPP_IKS01A3_03_02 to CPP_IKS01A3_03_03 .

Now we take a container of the type array as a circular buffer.

The array should hold 6 values.

We form the mean value via the array with iterators.

Output this via the console.

Task 03_4_CPP_SpitirLevel

Create new the project: CPP_SpiritLevel_03_04.

Implement the classes according to the concept.

The LED1, LED2 and LED3 serve as spirit levels. To indicate whether the PCB is straight.

For this we extend the class STM32H7Led

Instead of a ring buffer of a container array (as in the project CPP_IKS01A3) we now use a container of the type vector.

We use a custom allocator from Mr. Kormanyo'sauthor of Real-Time C++.We take the mean value of the accelerometer of the axis: Y of 10 values.

With the USER key we want to be able to make a zero offset of the sensor.

Set LEDS accordingly to the acc value of the Y-axis .

Output the value of the Y-axis on the console.

IKS01A3_Motion
- AxisValues: IKS01A3_MOTION_SENSOR_Axes_t
- AxisOffsets: IKS01A3_MOTION_SENSOR_Axes_t
- RingBufferAxisX: std::array <int32_t>
- RingBufferAxisY: std::array <int32_t>
- RingBufferAxisZ: std::array <int32_t>

+ init (Instance : uint32_t, Function : uint32_t)
+ enable (Instance : uint32_t, Function : uint32_t)
- getValue (Instance : uint32_t, Function : uint32_t, XAxis : int32_t *, YAxis : int32_t *, ZAxis : int32_t *)
+ setZero ()
+ updateValues (Instance : uint32_t, Function : uint32_t,)
+ getAVGValues (XAxis : int32_t *, YAxis : int32_t *, ZAxis : int32_t *)

STM32H7Led
- Port: GPIO_TypeDef *
- Pin: uint16_t

+ STM32H7Led (*Port : GPIO_TypeDef, Pin : uint16_t)
+ STM32H7_led ()
+ ~STM32H7_led ()
+ toggleLED ()
+ setLED ()
+ unsetLED ()

AccGyroSensor
- INSTANCE: const uin32_t = 0
- FUCNTION_INIT_ACC_GYRO: const uin32_t = MOTION_ACCELEROMOTION_GYRO
- FUNCTION_ACC: const uin32_t = MOTION_ACCELERO
- FUNCTION_GYRO: const uin32_t = MOTION_GYRO

+ initSensor ()
+ updateValues ()

AccSensor
- INSTANCE: const uin32_t = 1
- FUNCTION_ACC: const uin32_t = MOTION_ACCELERO

+ initSensor ()
+ updateValues ()

SpiritLevelSinglAxis3LED
- Threshold: const int32_t =200

+ init ()
+ updateValues ()
+ show ()
+ setZero ()