* C does not give us classes
* All of the HAL stuff is written the way we want
* We create an object (a C structure)
* Contains all data for the object, however the functions are not a part of that ibjects
* Each function is written separately and takes in the object as a parameter so it can act on it
* Header files describes what will be implemented in a .c file but does not do any of that implementation
* Need to define data types for the object you want to work with as a c struct
* We need to take as an argument a pointer to the motor object
  + Equivalent of self. , useu &
* The star \* is the d reference operator
* Converts a pointer into a value
* The & is the reference operator, which converts a value into a pointer
  + The & and the \* undo eachother
* You need to include the corresponding header file to each c file
* Anything we want to do in our funtrions we do to the pointer
* Don’t include .c files in other .c files
* To make new files go to the core
  + Right click, new, header or source file

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MCU Pins | | Motor Driver Inputs | | Motor Driver Outputs | | Mode |
| Pxx | Pyy | IN1 | IN2 | OUT1 | OUT2 |
| 0 | 0 | L | L | OFF (Hi-Z) | OFF (Hi-Z) | Stop (standby mode after 1 ms) |
| 0 | 1 | L | H | L | H | Reverse |
| 1 | 0 | H | L | H | L | Forward |
| 1 | 1 | H | H | H | H | Brake |

/\* USER CODE BEGIN Header \*/

/\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* @file : main.c

\* @brief : Main program body

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* @attention

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\*

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\*/

/\* USER CODE END Header \*/

/\* Includes ------------------------------------------------------------------\*/

**#include** "main.h"

/\* Private includes ----------------------------------------------------------\*/

/\* USER CODE BEGIN Includes \*/

/\* USER CODE END Includes \*/

/\* Private typedef -----------------------------------------------------------\*/

/\* USER CODE BEGIN PTD \*/

/\* USER CODE END PTD \*/

/\* Private define ------------------------------------------------------------\*/

/\* USER CODE BEGIN PD \*/

/\* USER CODE END PD \*/

/\* Private macro -------------------------------------------------------------\*/

/\* USER CODE BEGIN PM \*/

/\* USER CODE END PM \*/

/\* Private variables ---------------------------------------------------------\*/

TIM\_HandleTypeDef htim2;

/\* USER CODE BEGIN PV \*/

**int** pwm\_sig = 1600000;

/\* USER CODE END PV \*/

/\* Private function prototypes -----------------------------------------------\*/

**void** **SystemClock\_Config**(**void**);

**static** **void** **MX\_GPIO\_Init**(**void**);

**static** **void** **MX\_TIM2\_Init**(**void**);

/\* USER CODE BEGIN PFP \*/

/\* USER CODE END PFP \*/

/\* Private user code ---------------------------------------------------------\*/

/\* USER CODE BEGIN 0 \*/

/\* USER CODE END 0 \*/

/\*\*

\* @brief The application entry point.

\* @retval int

\*/

**int** **main**(**void**)

{

/\* USER CODE BEGIN 1 \*/

/\* USER CODE END 1 \*/

/\* MCU Configuration--------------------------------------------------------\*/

/\* Reset of all peripherals, Initializes the Flash interface and the Systick. \*/

HAL\_Init();

/\* USER CODE BEGIN Init \*/

/\* USER CODE END Init \*/

/\* Configure the system clock \*/

SystemClock\_Config();

/\* USER CODE BEGIN SysInit \*/

/\* USER CODE END SysInit \*/

/\* Initialize all configured peripherals \*/

MX\_GPIO\_Init();

MX\_TIM2\_Init();

/\* USER CODE BEGIN 2 \*/

HAL\_TIM\_PWM\_Start(&htim2, TIM\_CHANNEL\_1);

/\* USER CODE END 2 \*/

/\* Infinite loop \*/

/\* USER CODE BEGIN WHILE \*/

**while** (1)

{

\_\_HAL\_TIM\_SET\_COMPARE(&htim2, TIM\_CHANNEL\_1,pwm\_sig);

HAL\_Delay(10);

/\* USER CODE END WHILE \*/

/\* USER CODE BEGIN 3 \*/

}

/\* USER CODE END 3 \*/

}

/\*\*

\* @brief System Clock Configuration

\* @retval None

\*/

**void** **SystemClock\_Config**(**void**)

{

RCC\_OscInitTypeDef RCC\_OscInitStruct = {0};

RCC\_ClkInitTypeDef RCC\_ClkInitStruct = {0};

/\*\* Configure the main internal regulator output voltage

\*/

**if** (HAL\_PWREx\_ControlVoltageScaling(PWR\_REGULATOR\_VOLTAGE\_SCALE1) != *HAL\_OK*)

{

Error\_Handler();

}

/\*\* Initializes the RCC Oscillators according to the specified parameters

\* in the RCC\_OscInitTypeDef structure.

\*/

RCC\_OscInitStruct.OscillatorType = RCC\_OSCILLATORTYPE\_MSI;

RCC\_OscInitStruct.MSIState = RCC\_MSI\_ON;

RCC\_OscInitStruct.MSICalibrationValue = 0;

RCC\_OscInitStruct.MSIClockRange = RCC\_MSIRANGE\_6;

RCC\_OscInitStruct.PLL.PLLState = RCC\_PLL\_ON;

RCC\_OscInitStruct.PLL.PLLSource = RCC\_PLLSOURCE\_MSI;

RCC\_OscInitStruct.PLL.PLLM = 1;

RCC\_OscInitStruct.PLL.PLLN = 40;

RCC\_OscInitStruct.PLL.PLLP = RCC\_PLLP\_DIV7;

RCC\_OscInitStruct.PLL.PLLQ = RCC\_PLLQ\_DIV2;

RCC\_OscInitStruct.PLL.PLLR = RCC\_PLLR\_DIV2;

**if** (HAL\_RCC\_OscConfig(&RCC\_OscInitStruct) != *HAL\_OK*)

{

Error\_Handler();

}

/\*\* Initializes the CPU, AHB and APB buses clocks

\*/

RCC\_ClkInitStruct.ClockType = RCC\_CLOCKTYPE\_HCLK|RCC\_CLOCKTYPE\_SYSCLK

|RCC\_CLOCKTYPE\_PCLK1|RCC\_CLOCKTYPE\_PCLK2;

RCC\_ClkInitStruct.SYSCLKSource = RCC\_SYSCLKSOURCE\_PLLCLK;

RCC\_ClkInitStruct.AHBCLKDivider = RCC\_SYSCLK\_DIV1;

RCC\_ClkInitStruct.APB1CLKDivider = RCC\_HCLK\_DIV2;

RCC\_ClkInitStruct.APB2CLKDivider = RCC\_HCLK\_DIV1;

**if** (HAL\_RCC\_ClockConfig(&RCC\_ClkInitStruct, FLASH\_LATENCY\_4) != *HAL\_OK*)

{

Error\_Handler();

}

}

/\*\*

\* @brief TIM2 Initialization Function

\* @param None

\* @retval None

\*/

**static** **void** **MX\_TIM2\_Init**(**void**)

{

/\* USER CODE BEGIN TIM2\_Init 0 \*/

/\* USER CODE END TIM2\_Init 0 \*/

TIM\_ClockConfigTypeDef sClockSourceConfig = {0};

TIM\_MasterConfigTypeDef sMasterConfig = {0};

TIM\_OC\_InitTypeDef sConfigOC = {0};

/\* USER CODE BEGIN TIM2\_Init 1 \*/

/\* USER CODE END TIM2\_Init 1 \*/

htim2.Instance = TIM2;

htim2.Init.Prescaler = 0;

htim2.Init.CounterMode = TIM\_COUNTERMODE\_UP;

htim2.Init.Period = 39999999;

htim2.Init.ClockDivision = TIM\_CLOCKDIVISION\_DIV1;

htim2.Init.AutoReloadPreload = TIM\_AUTORELOAD\_PRELOAD\_DISABLE;

**if** (HAL\_TIM\_Base\_Init(&htim2) != *HAL\_OK*)

{

Error\_Handler();

}

sClockSourceConfig.ClockSource = TIM\_CLOCKSOURCE\_INTERNAL;

**if** (HAL\_TIM\_ConfigClockSource(&htim2, &sClockSourceConfig) != *HAL\_OK*)

{

Error\_Handler();

}

**if** (HAL\_TIM\_PWM\_Init(&htim2) != *HAL\_OK*)

{

Error\_Handler();

}

sMasterConfig.MasterOutputTrigger = TIM\_TRGO\_RESET;

sMasterConfig.MasterSlaveMode = TIM\_MASTERSLAVEMODE\_DISABLE;

**if** (HAL\_TIMEx\_MasterConfigSynchronization(&htim2, &sMasterConfig) != *HAL\_OK*)

{

Error\_Handler();

}

sConfigOC.OCMode = TIM\_OCMODE\_PWM1;

sConfigOC.Pulse = 16000000;

sConfigOC.OCPolarity = TIM\_OCPOLARITY\_HIGH;

sConfigOC.OCFastMode = TIM\_OCFAST\_DISABLE;

**if** (HAL\_TIM\_PWM\_ConfigChannel(&htim2, &sConfigOC, TIM\_CHANNEL\_1) != *HAL\_OK*)

{

Error\_Handler();

}

/\* USER CODE BEGIN TIM2\_Init 2 \*/

/\* USER CODE END TIM2\_Init 2 \*/

HAL\_TIM\_MspPostInit(&htim2);

}

/\*\*

\* @brief GPIO Initialization Function

\* @param None

\* @retval None

\*/

**static** **void** **MX\_GPIO\_Init**(**void**)

{

/\* USER CODE BEGIN MX\_GPIO\_Init\_1 \*/

/\* USER CODE END MX\_GPIO\_Init\_1 \*/

/\* GPIO Ports Clock Enable \*/

\_\_HAL\_RCC\_GPIOA\_CLK\_ENABLE();

/\* USER CODE BEGIN MX\_GPIO\_Init\_2 \*/

/\* USER CODE END MX\_GPIO\_Init\_2 \*/

}

/\* USER CODE BEGIN 4 \*/

/\* USER CODE END 4 \*/

/\*\*

\* @brief This function is executed in case of error occurrence.

\* @retval None

\*/

**void** **Error\_Handler**(**void**)

{

/\* USER CODE BEGIN Error\_Handler\_Debug \*/

/\* User can add his own implementation to report the HAL error return state \*/

\_\_disable\_irq();

**while** (1)

{

}

/\* USER CODE END Error\_Handler\_Debug \*/

}

**#ifdef** USE\_FULL\_ASSERT

/\*\*

\* @brief Reports the name of the source file and the source line number

\* where the assert\_param error has occurred.

\* @param file: pointer to the source file name

\* @param line: assert\_param error line source number

\* @retval None

\*/

**void** assert\_failed(uint8\_t \*file, uint32\_t line)

{

/\* USER CODE BEGIN 6 \*/

/\* User can add his own implementation to report the file name and line number,

ex: printf("Wrong parameters value: file %s on line %d\r\n", file, line) \*/

/\* USER CODE END 6 \*/

}

**#endif** /\* USE\_FULL\_ASSERT \*/

/\* USER CODE BEGIN Header \*/

/\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* @file : main.c

\* @brief : Main program body

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\* @attention

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\*

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\*/

/\* USER CODE END Header \*/

/\* Includes ------------------------------------------------------------------\*/

**#include** "main.h"

**#include** "string.h"

/\* Private includes ----------------------------------------------------------\*/

/\* USER CODE BEGIN Includes \*/

/\* USER CODE END Includes \*/

/\* Private typedef -----------------------------------------------------------\*/

/\* USER CODE BEGIN PTD \*/

/\* USER CODE END PTD \*/

/\* Private define ------------------------------------------------------------\*/

/\* USER CODE BEGIN PD \*/

/\* USER CODE END PD \*/

/\* Private macro -------------------------------------------------------------\*/

/\* USER CODE BEGIN PM \*/

/\* USER CODE END PM \*/

/\* Private variables ---------------------------------------------------------\*/

UART\_HandleTypeDef huart2;

/\* USER CODE BEGIN PV \*/

**int** count = 0;

**char** buffer[50];

**int** n;

/\* USER CODE END PV \*/

/\* Private function prototypes -----------------------------------------------\*/

**void** **SystemClock\_Config**(**void**);

**static** **void** **MX\_GPIO\_Init**(**void**);

**static** **void** **MX\_USART2\_UART\_Init**(**void**);

/\* USER CODE BEGIN PFP \*/

/\* USER CODE END PFP \*/

/\* Private user code ---------------------------------------------------------\*/

/\* USER CODE BEGIN 0 \*/

/\* USER CODE END 0 \*/

/\*\*

\* @brief The application entry point.

\* @retval int

\*/

**int** **main**(**void**)

{

/\* USER CODE BEGIN 1 \*/

/\* USER CODE END 1 \*/

/\* MCU Configuration--------------------------------------------------------\*/

/\* Reset of all peripherals, Initializes the Flash interface and the Systick. \*/

HAL\_Init();

/\* USER CODE BEGIN Init \*/

/\* USER CODE END Init \*/

/\* Configure the system clock \*/

SystemClock\_Config();

/\* USER CODE BEGIN SysInit \*/

/\* USER CODE END SysInit \*/

/\* Initialize all configured peripherals \*/

MX\_GPIO\_Init();

MX\_USART2\_UART\_Init();

/\* USER CODE BEGIN 2 \*/

/\* USER CODE END 2 \*/

/\* Infinite loop \*/

/\* USER CODE BEGIN WHILE \*/

**while** (1)

{

/\* USER CODE END WHILE \*/

/\*turn the pin on and wait\*/

HAL\_GPIO\_WritePin(LD2\_GPIO\_Port,LD2\_Pin,*GPIO\_PIN\_SET*);

HAL\_Delay(200);

count = count + 1;

/\*turn the pin off and wait\*/

HAL\_GPIO\_WritePin(LD2\_GPIO\_Port,LD2\_Pin,*GPIO\_PIN\_RESET*);

HAL\_Delay(300);

/\*send the current count to be displayed\*/

n = **sprintf**(buffer,"LED HAS BLINKED %d TIMES \n\r",count);

HAL\_UART\_Transmit(&huart2,buffer,n,400);

/\* USER CODE BEGIN 3 \*/

}

/\* USER CODE END 3 \*/

}

/\*\*

\* @brief System Clock Configuration

\* @retval None

\*/

**void** **SystemClock\_Config**(**void**)

{

RCC\_OscInitTypeDef RCC\_OscInitStruct = {0};

RCC\_ClkInitTypeDef RCC\_ClkInitStruct = {0};

/\*\* Configure the main internal regulator output voltage

\*/

**if** (HAL\_PWREx\_ControlVoltageScaling(PWR\_REGULATOR\_VOLTAGE\_SCALE1) != *HAL\_OK*)

{

Error\_Handler();

}

/\*\* Initializes the RCC Oscillators according to the specified parameters

\* in the RCC\_OscInitTypeDef structure.

\*/

RCC\_OscInitStruct.OscillatorType = RCC\_OSCILLATORTYPE\_HSI;

RCC\_OscInitStruct.HSIState = RCC\_HSI\_ON;

RCC\_OscInitStruct.HSICalibrationValue = RCC\_HSICALIBRATION\_DEFAULT;

RCC\_OscInitStruct.PLL.PLLState = RCC\_PLL\_ON;

RCC\_OscInitStruct.PLL.PLLSource = RCC\_PLLSOURCE\_HSI;

RCC\_OscInitStruct.PLL.PLLM = 1;

RCC\_OscInitStruct.PLL.PLLN = 10;

RCC\_OscInitStruct.PLL.PLLP = RCC\_PLLP\_DIV7;

RCC\_OscInitStruct.PLL.PLLQ = RCC\_PLLQ\_DIV2;

RCC\_OscInitStruct.PLL.PLLR = RCC\_PLLR\_DIV2;

**if** (HAL\_RCC\_OscConfig(&RCC\_OscInitStruct) != *HAL\_OK*)

{

Error\_Handler();

}

/\*\* Initializes the CPU, AHB and APB buses clocks

\*/

RCC\_ClkInitStruct.ClockType = RCC\_CLOCKTYPE\_HCLK|RCC\_CLOCKTYPE\_SYSCLK

|RCC\_CLOCKTYPE\_PCLK1|RCC\_CLOCKTYPE\_PCLK2;

RCC\_ClkInitStruct.SYSCLKSource = RCC\_SYSCLKSOURCE\_PLLCLK;

RCC\_ClkInitStruct.AHBCLKDivider = RCC\_SYSCLK\_DIV1;

RCC\_ClkInitStruct.APB1CLKDivider = RCC\_HCLK\_DIV1;

RCC\_ClkInitStruct.APB2CLKDivider = RCC\_HCLK\_DIV1;

**if** (HAL\_RCC\_ClockConfig(&RCC\_ClkInitStruct, FLASH\_LATENCY\_4) != *HAL\_OK*)

{

Error\_Handler();

}

}

/\*\*

\* @brief USART2 Initialization Function

\* @param None

\* @retval None

\*/

**static** **void** **MX\_USART2\_UART\_Init**(**void**)

{

/\* USER CODE BEGIN USART2\_Init 0 \*/

/\* USER CODE END USART2\_Init 0 \*/

/\* USER CODE BEGIN USART2\_Init 1 \*/

/\* USER CODE END USART2\_Init 1 \*/

huart2.Instance = USART2;

huart2.Init.BaudRate = 115200;

huart2.Init.WordLength = UART\_WORDLENGTH\_8B;

huart2.Init.StopBits = UART\_STOPBITS\_1;

huart2.Init.Parity = UART\_PARITY\_NONE;

huart2.Init.Mode = UART\_MODE\_TX\_RX;

huart2.Init.HwFlowCtl = UART\_HWCONTROL\_NONE;

huart2.Init.OverSampling = UART\_OVERSAMPLING\_16;

huart2.Init.OneBitSampling = UART\_ONE\_BIT\_SAMPLE\_DISABLE;

huart2.AdvancedInit.AdvFeatureInit = UART\_ADVFEATURE\_NO\_INIT;

**if** (HAL\_UART\_Init(&huart2) != *HAL\_OK*)

{

Error\_Handler();

}

/\* USER CODE BEGIN USART2\_Init 2 \*/

/\* USER CODE END USART2\_Init 2 \*/

}

/\*\*

\* @brief GPIO Initialization Function

\* @param None

\* @retval None

\*/

**static** **void** **MX\_GPIO\_Init**(**void**)

{

GPIO\_InitTypeDef GPIO\_InitStruct = {0};

/\* USER CODE BEGIN MX\_GPIO\_Init\_1 \*/

/\* USER CODE END MX\_GPIO\_Init\_1 \*/

/\* GPIO Ports Clock Enable \*/

\_\_HAL\_RCC\_GPIOC\_CLK\_ENABLE();

\_\_HAL\_RCC\_GPIOH\_CLK\_ENABLE();

\_\_HAL\_RCC\_GPIOA\_CLK\_ENABLE();

\_\_HAL\_RCC\_GPIOB\_CLK\_ENABLE();

/\*Configure GPIO pin Output Level \*/

HAL\_GPIO\_WritePin(LD2\_GPIO\_Port, LD2\_Pin, *GPIO\_PIN\_RESET*);

/\*Configure GPIO pin : B1\_Pin \*/

GPIO\_InitStruct.Pin = B1\_Pin;

GPIO\_InitStruct.Mode = GPIO\_MODE\_IT\_FALLING;

GPIO\_InitStruct.Pull = GPIO\_NOPULL;

HAL\_GPIO\_Init(B1\_GPIO\_Port, &GPIO\_InitStruct);

/\*Configure GPIO pin : LD2\_Pin \*/

GPIO\_InitStruct.Pin = LD2\_Pin;

GPIO\_InitStruct.Mode = GPIO\_MODE\_OUTPUT\_PP;

GPIO\_InitStruct.Pull = GPIO\_NOPULL;

GPIO\_InitStruct.Speed = GPIO\_SPEED\_FREQ\_LOW;

HAL\_GPIO\_Init(LD2\_GPIO\_Port, &GPIO\_InitStruct);

/\* USER CODE BEGIN MX\_GPIO\_Init\_2 \*/

/\* USER CODE END MX\_GPIO\_Init\_2 \*/

}

/\* USER CODE BEGIN 4 \*/

/\* USER CODE END 4 \*/

/\*\*

\* @brief This function is executed in case of error occurrence.

\* @retval None

\*/

**void** **Error\_Handler**(**void**)

{

/\* USER CODE BEGIN Error\_Handler\_Debug \*/

/\* User can add his own implementation to report the HAL error return state \*/

\_\_disable\_irq();

**while** (1)

{

}

/\* USER CODE END Error\_Handler\_Debug \*/

}

**#ifdef** USE\_FULL\_ASSERT

/\*\*

\* @brief Reports the name of the source file and the source line number

\* where the assert\_param error has occurred.

\* @param file: pointer to the source file name

\* @param line: assert\_param error line source number

\* @retval None

\*/

**void** assert\_failed(uint8\_t \*file, uint32\_t line)

{

/\* USER CODE BEGIN 6 \*/

/\* User can add his own implementation to report the file name and line number,

ex: printf("Wrong parameters value: file %s on line %d\r\n", file, line) \*/

/\* USER CODE END 6 \*/

}

**#endif** /\* USE\_FULL\_ASSERT \*/

// Task 1 - KEY INPUTS

**void** **task1**(**void**) {

**static** **int** currentState = 0;

// Task 0 - INIT

**if** (currentState == 0) {

**printf**("Task 1, State 0\n");

HAL\_UART\_Receive\_IT(&huart2, (uint8\_t\*)&char\_in,1);

currentState = 1;

}

//Task 1 - Wait for Key input

**else** **if** (currentState == 1) {

**printf**("Task 1, State 1\n");

**if**(char\_flag == 1){

// Transition to state 2

currentState = 2;

buff[pos] = char\_in;

pos++;}

//make sure the position is not larger than the size of the buffer

}

//Task 2 - ECHO

**else** **if** (currentState == 2) {

**printf**("Task 1, State 1\n");

HAL\_UART\_Transmit(&huart2, (uint8\_t\*)&char\_in,1,1);

HAL\_UART\_Receive\_IT(&huart2, (uint8\_t\*)&char\_in,1);

char\_flag = 0;

currentState = 1;

}

**else** {

// Invalid state

currentState = 0; // Reset state

}

}

// Task 2 MOTOR AND KEY INTERPRETATION

**void** **task2**(**void**) {

**static** **int** currentState = 0;

**static** **int** motor\_num = 0;

**static** **int** duty = 0;

// State 0 - INIT MOTORS

**if** (currentState == 0) {

**printf**("Task 2, State 0\n");

// Make a motor object

motor\_t mot1 = {.duty = 0,

.channel1 = TIM\_CHANNEL\_1,

.channel2 = TIM\_CHANNEL\_2,

.hal\_tim = &htim2

};

motor\_t mot2 = {.duty = 0,

.channel1 = TIM\_CHANNEL\_1,

.channel2 = TIM\_CHANNEL\_2,

.hal\_tim = &htim3

};

//start PWM generation for both motors

start\_PWM(&mot1, 1);

start\_PWM(&mot1, 2);

start\_PWM(&mot2, 1);

start\_PWM(&mot2, 2);

set\_duty(&mot1,640);

set\_duty(&mot2,640);

// Transition to state Always

currentState = 1;

//State 1 - Wait for Carriage return or new line

} **else** **if** (currentState == 1) {

**printf**("Task 2, State 1\n");

**char** check = buff[pos];

**if** (check == '\n')

{

currentState = 2;

}

**else** **if** (check == '\r')

{

currentState = 2;

}

}

//State 2 - Buffer Valid?

**else** **if** (currentState == 2) {

**printf**("Task 2, State 1\n");

//check the buffer to see if its a valid input

// Transition to state 0

currentState = 1;

}

//State 3 - Update Motors

**else** **if** (currentState == 1) {

**printf**("Task 2, State 1\n");

**if**(motor\_num == 1){

set\_duty(&mot1,duty);

}

**if**(motor\_num == 2){

set\_duty(&mot2,duty);

}

// Transition to state 0

currentState = 0;

} **else** {

// Invalid state

currentState = 0; // Reset state

}

}