UCSD Embedded C Assignment 2

By

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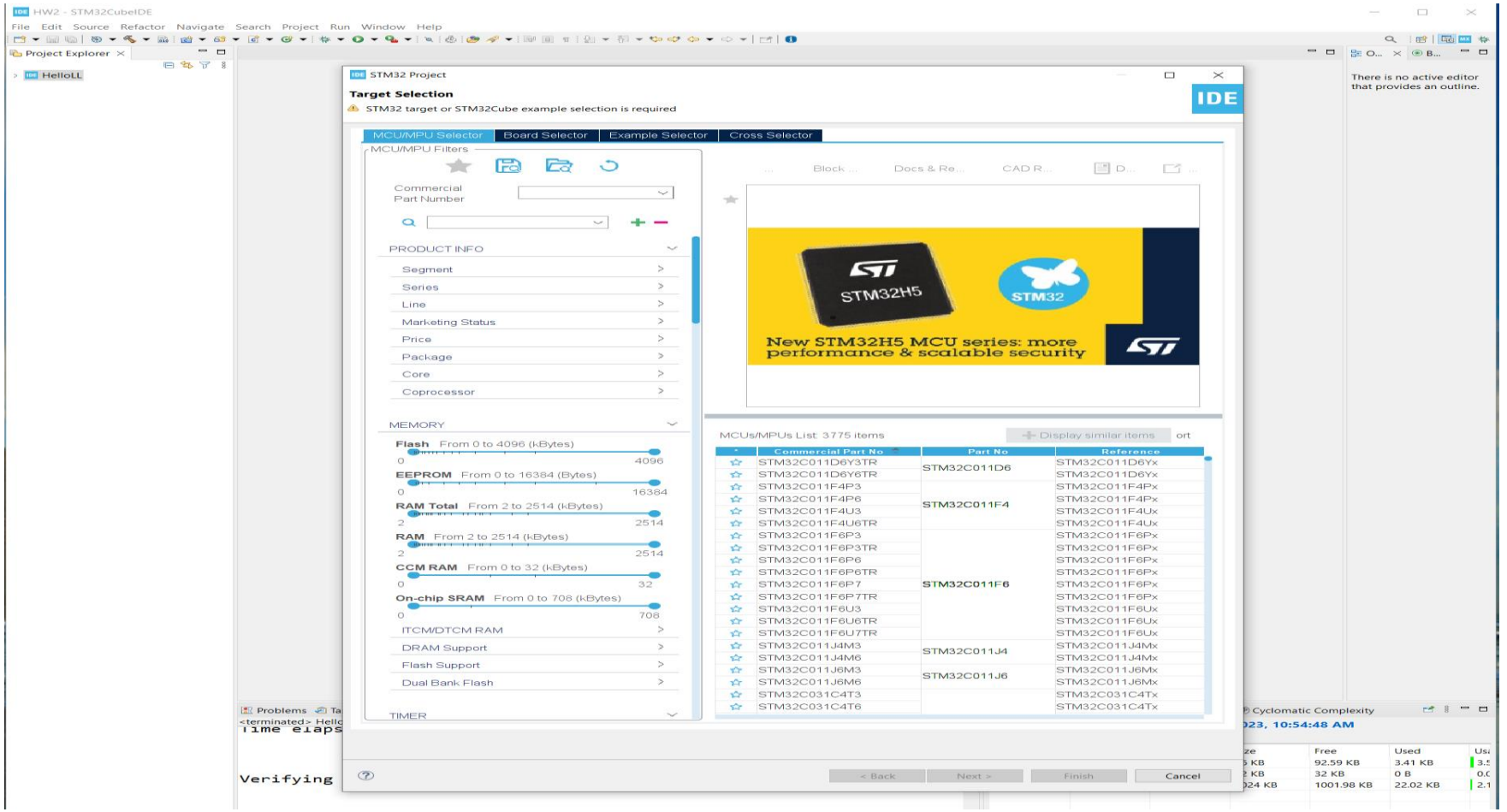
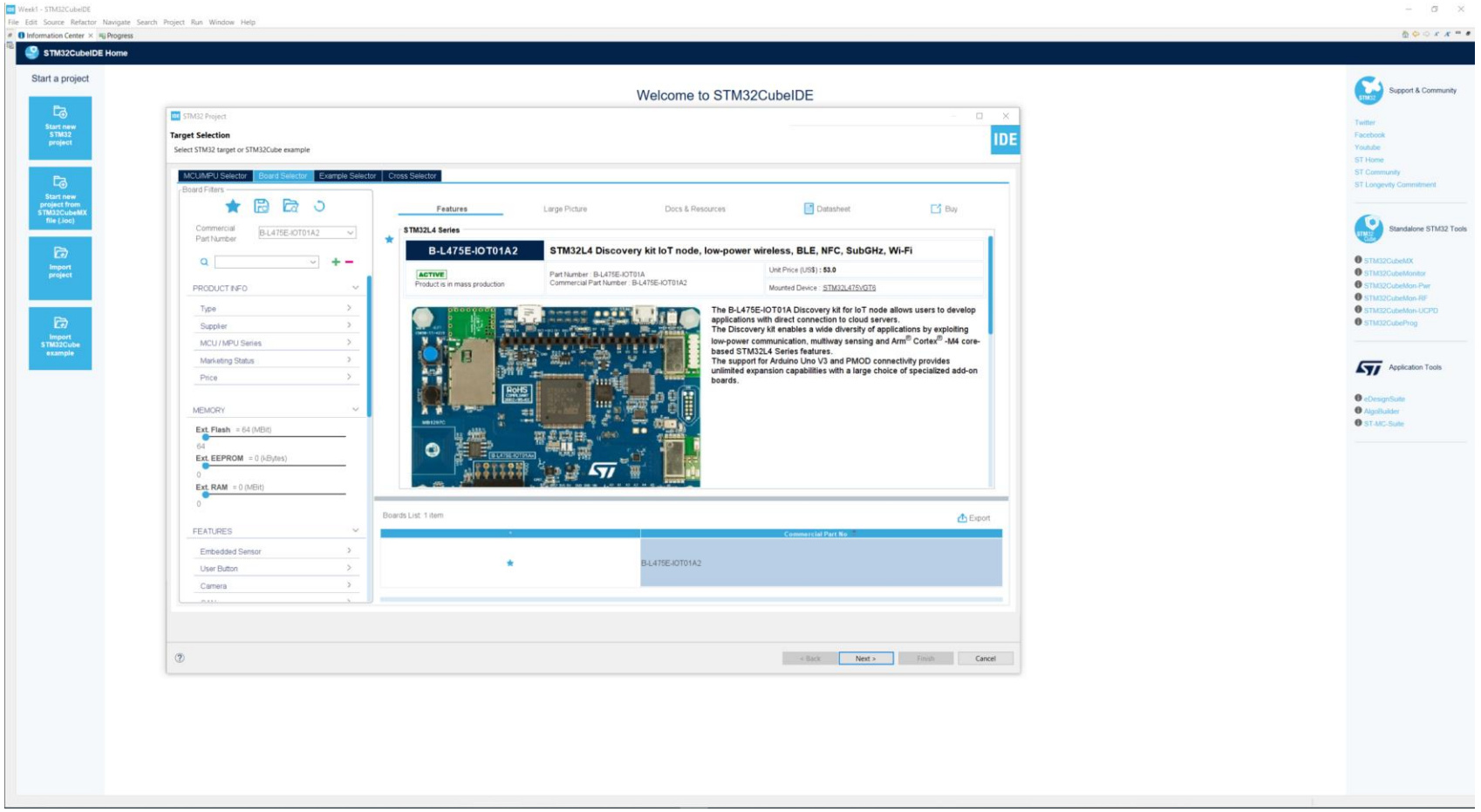
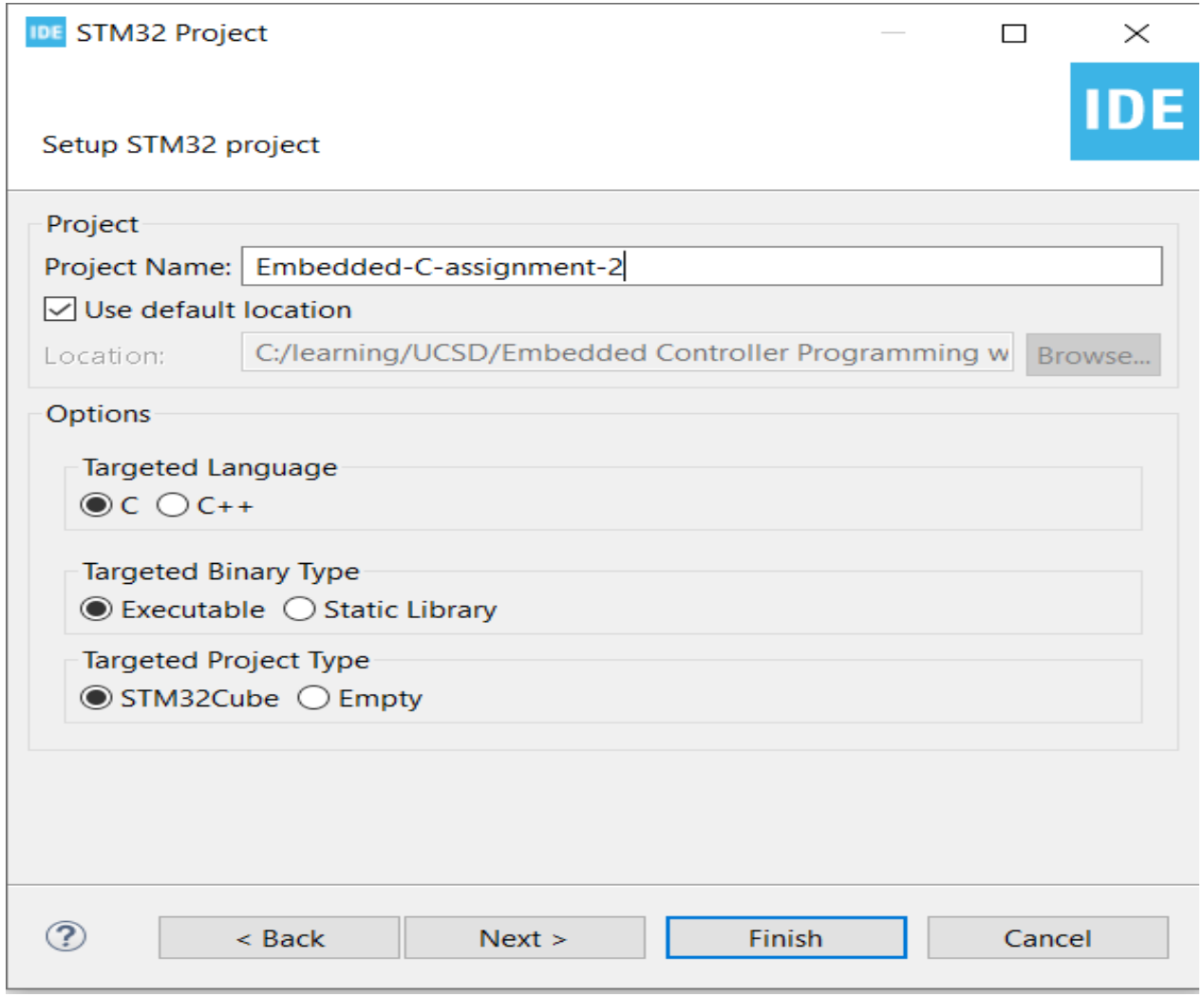
Step 1. Startup STM32CubeIDE and create new STM32 project



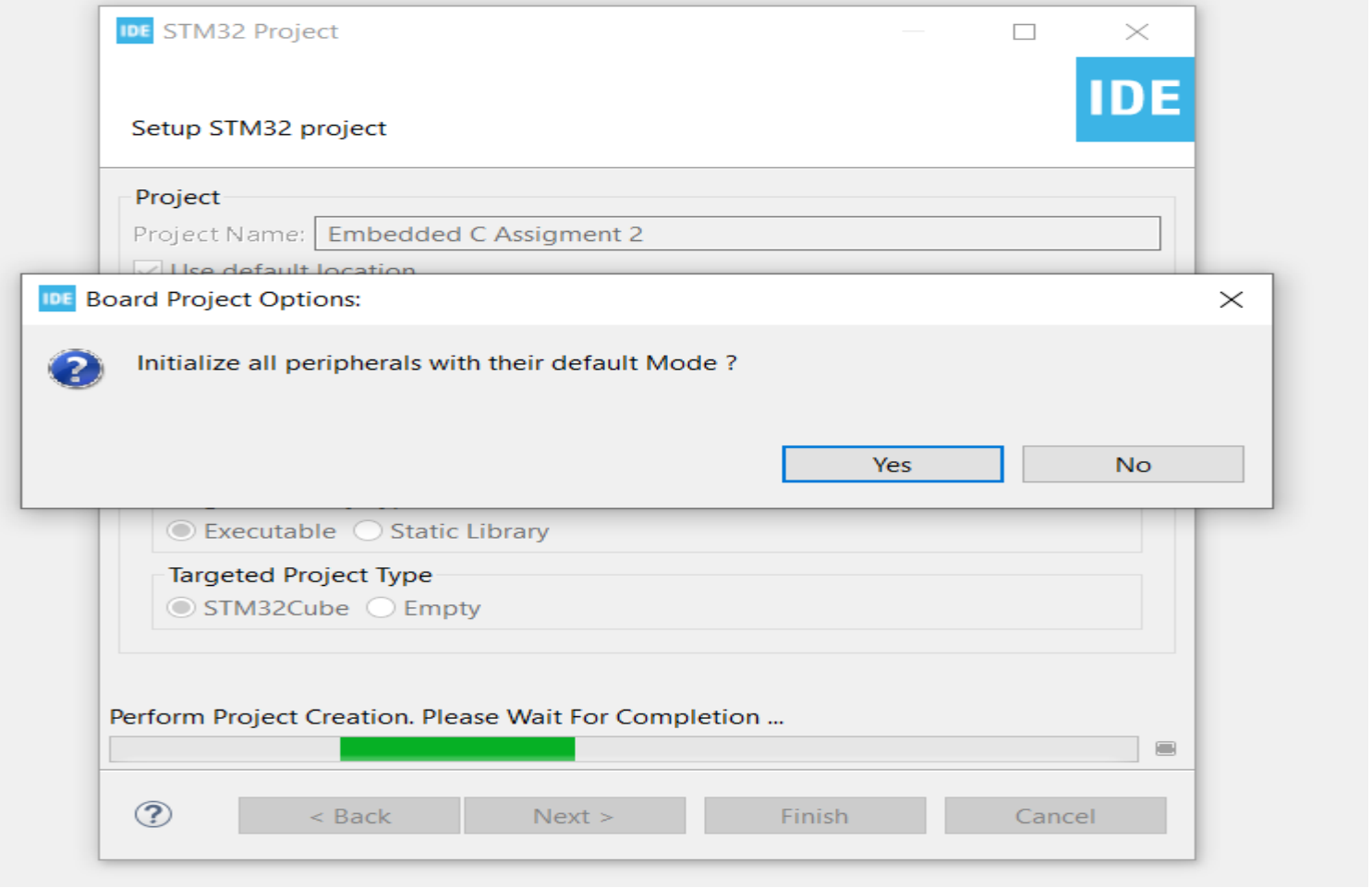
Step 2. Access board selector and type in the board you use, click Next



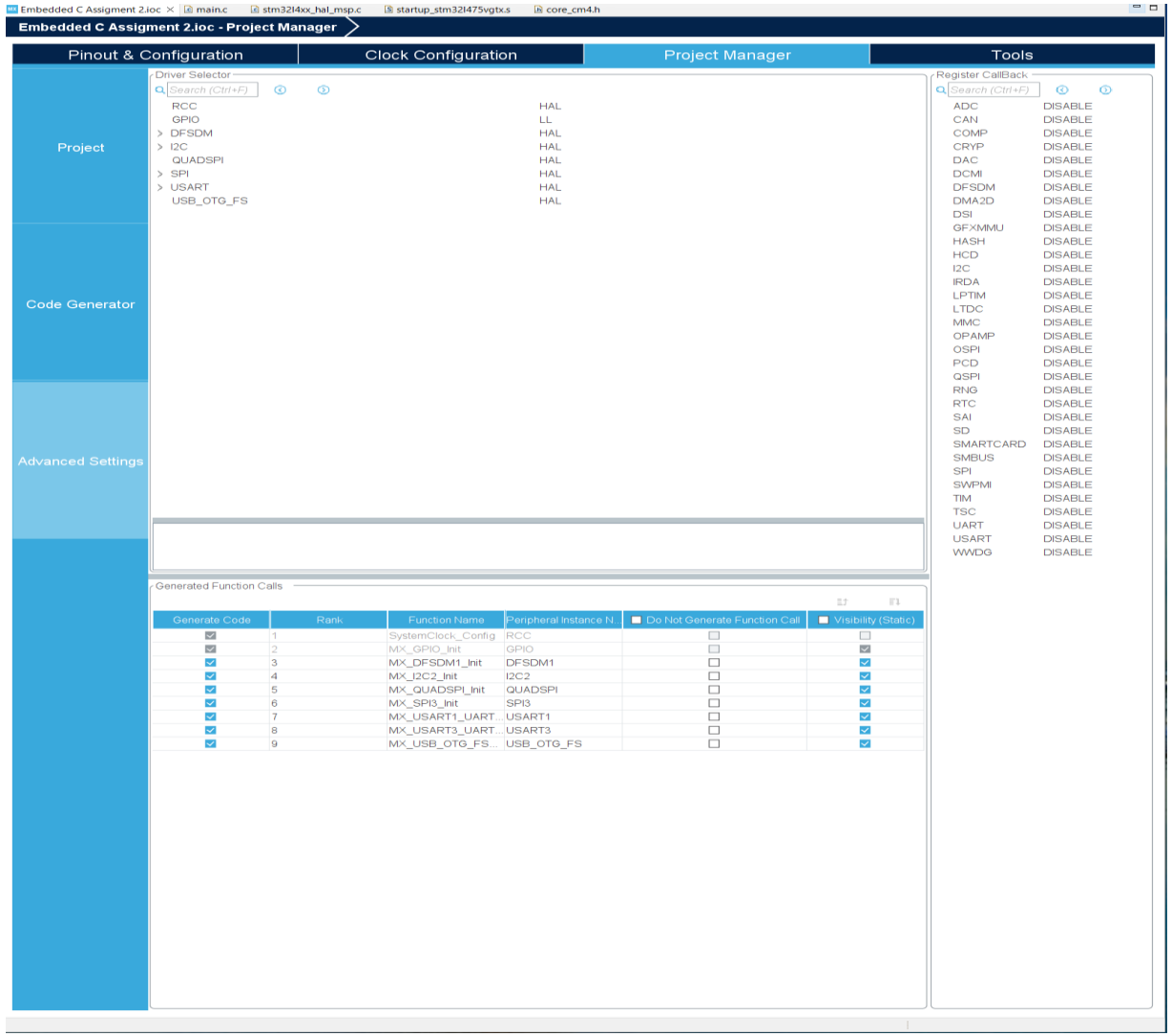
Step 4. Enter the project name then click Finish



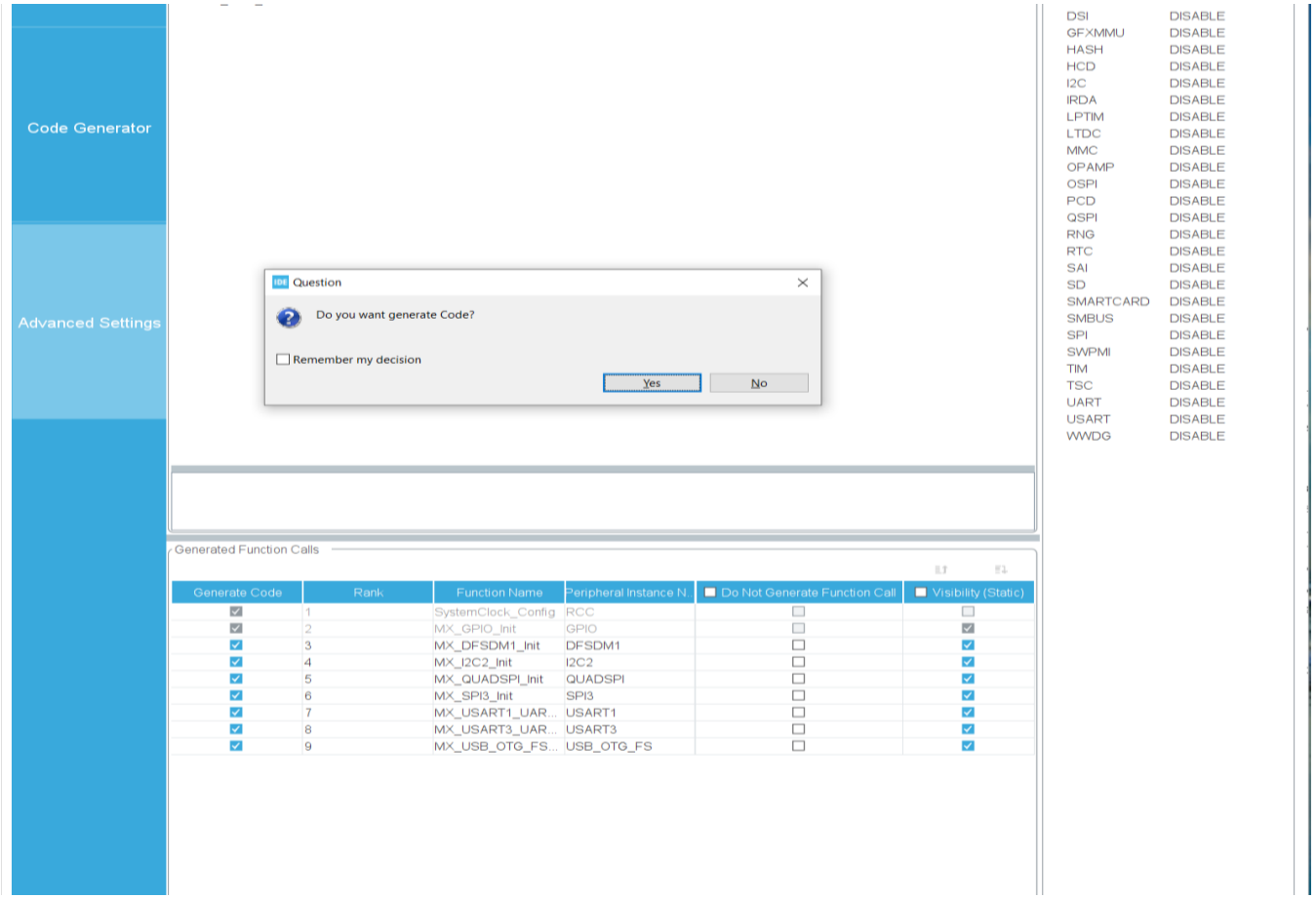
Step 5. Click yes to initialize all peripherals to default



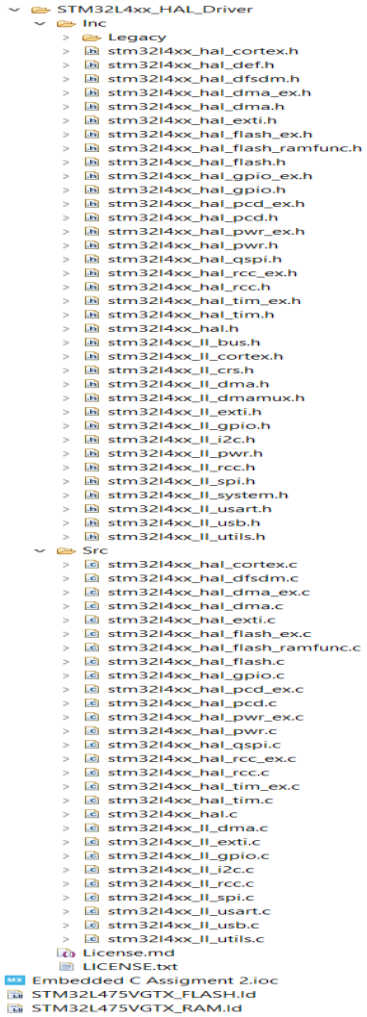
Step 6. When in .ioc file, click Project Manager -> advanced settings -> Driver Selector and change the GPIO driver to use LL



Step 7. Save and click yes to generate code



Step 8. See if we have all the needed LL file included in the file folder



Step 9. Find GPIO Init code that initializes the LED2 using LL (highlighted in blue below)

Embedded C Assigment 2.ioc | main.c

```
530 }
531
532 /**
533   * @brief GPIO Initialization Function
534   * @param None
535   * @retval None
536   */
537 static void MX_GPIO_Init(void)
538 {
539   LL_EXTI_InitTypeDef EXTI_InitStruct = {0};
540   LL_GPIO_InitTypeDef GPIO_InitStruct = {0};
541 /* USER CODE BEGIN MX_GPIO_Init_1 */
542 /* USER CODE END MX_GPIO_Init_1 */
543
544   /* GPIO Ports Clock Enable */
545   LL_AHB2_GRP1_EnableClock(LL_AHB2_GRP1_PERIPH_GPIOE);
546   LL_AHB2_GRP1_EnableClock(LL_AHB2_GRP1_PERIPH_GPIOC);
547   LL_AHB2_GRP1_EnableClock(LL_AHB2_GRP1_PERIPH_GPIOA);
548   LL_AHB2_GRP1_EnableClock(LL_AHB2_GRP1_PERIPH_GPIOB);
549   LL_AHB2_GRP1_EnableClock(LL_AHB2_GRP1_PERIPH_GPIOD);
550
551   /**/
552   LL_GPIO_ResetOutputPin(GPIOE, M24SR64_Y_RF_DISABLE_Pin|M24SR64_Y_GPO_Pin|ISM43362_RST_Pin);
553
554   /**/
555   LL_GPIO_ResetOutputPin(GPIOA, ARD_D10_Pin|SPBTLE_RF_RST_Pin|ARD_D9_Pin);
556
557   /**/
558   LL_GPIO_ResetOutputPin(GPIOB, ARD_D8_Pin|ISM43362_BOOT0_Pin|ISM43362_WAKEUP_Pin|LED2_Pin
559                         |SPSGRF_915_SDN_Pin|ARD_D5_Pin);
560
561   /**/
562   LL_GPIO_ResetOutputPin(GPIOD, USB_OTG_FS_PWR_EN_Pin|PMOD_RESET_Pin|STSAFE_A100_RESET_Pin);
563
564   /**/
565   LL_GPIO_ResetOutputPin(GPIOC, VL53L0X_XSHUT_Pin|LED3_WIFI__LED4_BLE_Pin);
566
567   /**/
568   LL_GPIO_SetOutputPin(SPBTLE_RF_SPI3_CSN_GPIO_Port, SPBTLE_RF_SPI3_CSN_Pin);
569
570   /**/
571   LL_GPIO_SetOutputPin(SPSGRF_915_SPI3_CSN_GPIO_Port, SPSGRF_915_SPI3_CSN_Pin);
572
573   /**/
574   LL_GPIO_SetOutputPin(ISM43362_SPI3_CSN_GPIO_Port, ISM43362_SPI3_CSN_Pin);
575
576   /**/
577   GPIO_InitStruct.Pin = M24SR64_Y_RF_DISABLE_Pin|M24SR64_Y_GPO_Pin|ISM43362_RST_Pin|ISM43362_SP
578   GPIO_InitStruct.Mode = LL_GPIO_MODE_OUTPUT;
579   GPIO_InitStruct.Speed = LL_GPIO_SPEED_FREQ_LOW;
```

Step 10. Enter the code in CODE BEGIN section to get the flash size and device ID per requirement

Embedded C Assigment 2.ioc | main.c

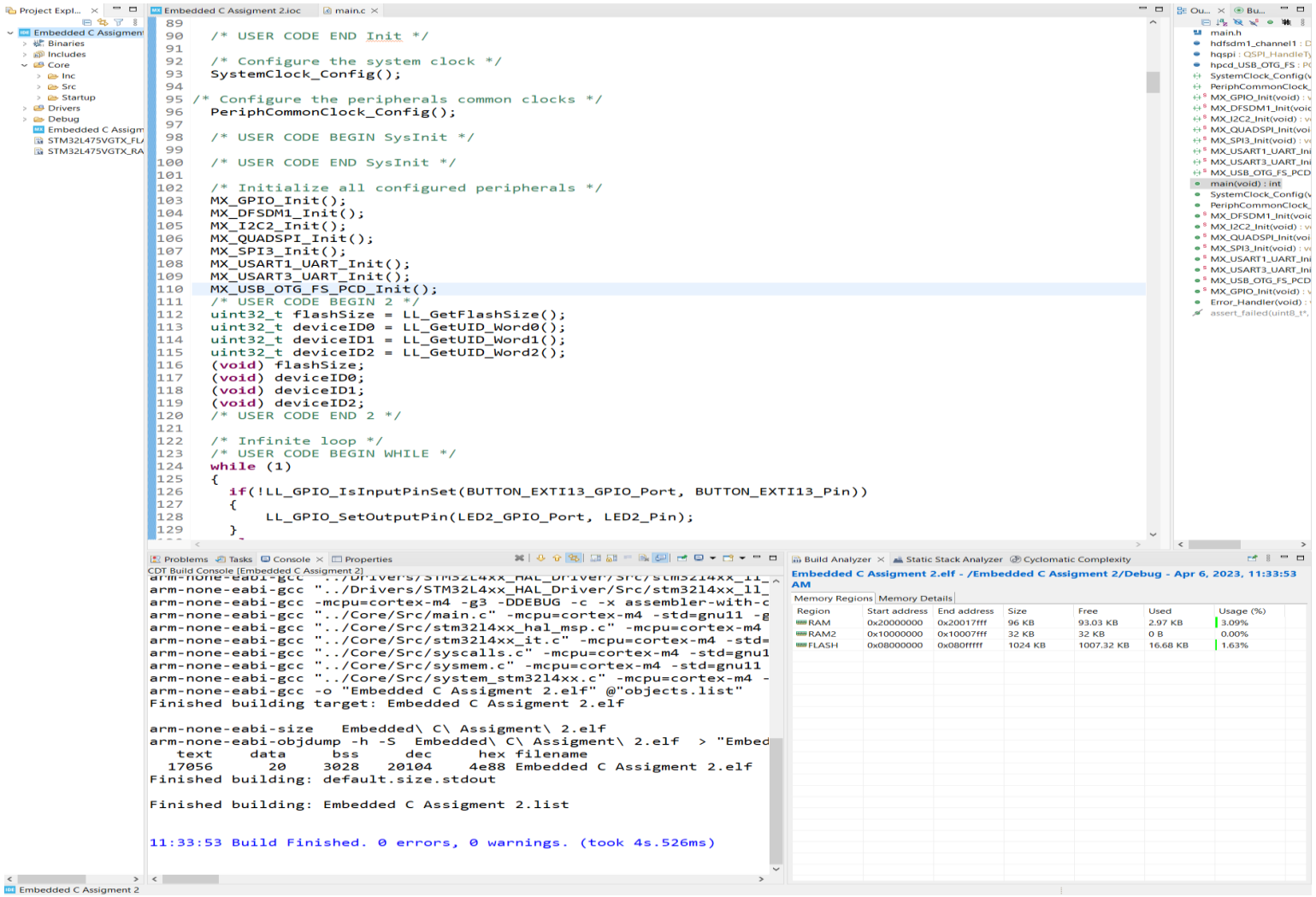
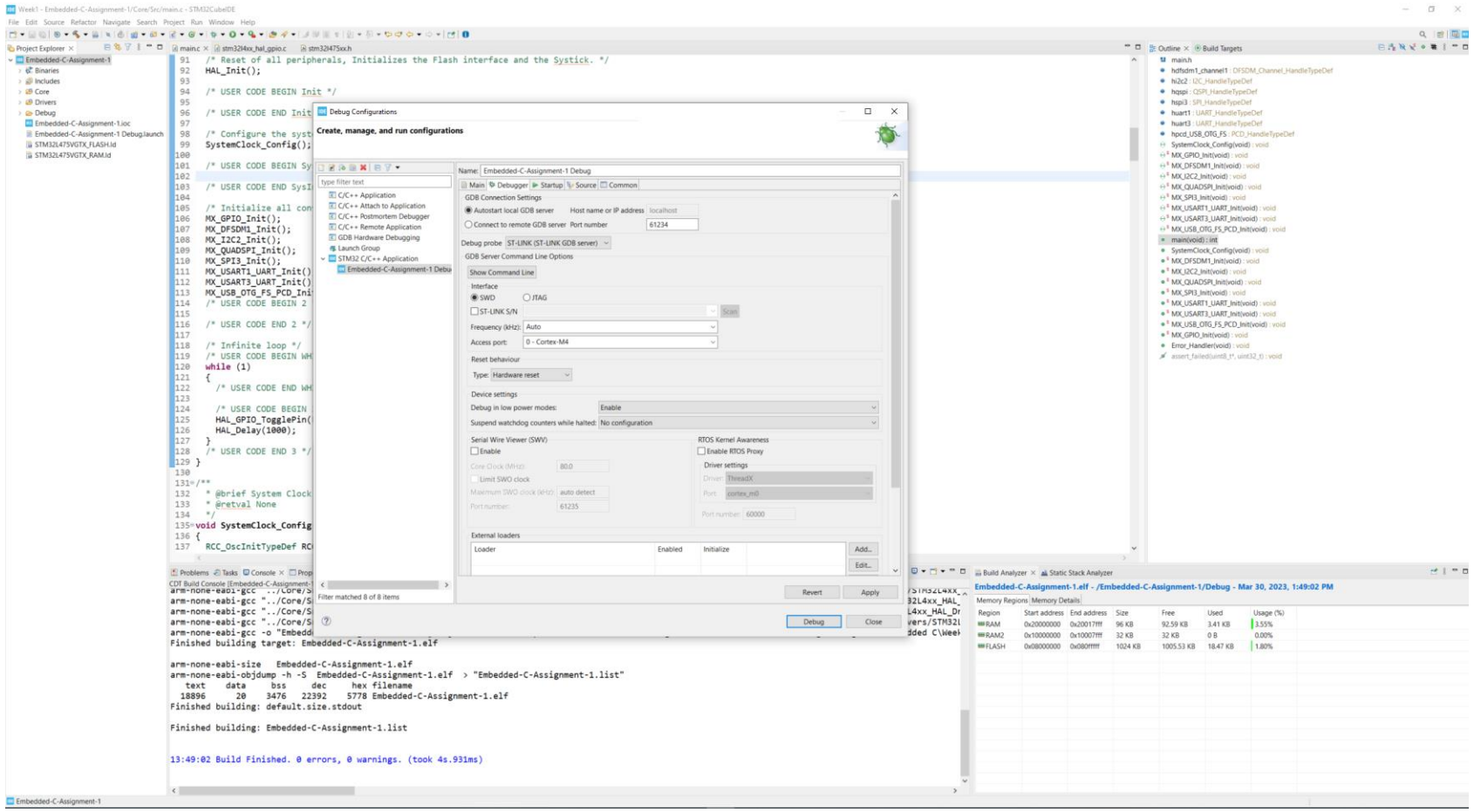
```
89
90    /* USER CODE END Init */
91
92    /* Configure the system clock */
93    SystemClock_Config();
94
95  /* Configure the peripherals common clocks */
96    PeriphCommonClock_Config();
97
98    /* USER CODE BEGIN SysInit */
99
100   /* USER CODE END SysInit */
101
102   /* Initialize all configured peripherals */
103   MX_GPIO_Init();
104   MX_DFSDM1_Init();
105   MX_I2C2_Init();
106   MX_QUADSPI_Init();
107   MX_SPI3_Init();
108   MX_USART1_UART_Init();
109   MX_USART3_UART_Init();
110   MX_USB_OTG_FS_PCD_Init();
111   /* USER CODE BEGIN 2 */
112   uint32_t flashSize = LL_GetFlashSize();
113   uint32_t deviceID0 = LL_GetUID_Word0();
114   uint32_t deviceID1 = LL_GetUID_Word1();
115   uint32_t deviceID2 = LL_GetUID_Word2();
116   (void) flashSize;
117   (void) deviceID0;
118   (void) deviceID1;
119   (void) deviceID2;
120   /* USER CODE END 2 */
121
122   /* Infinite loop */
123   /* USER CODE BEGIN WHILE */
124   while (1)
125   {
126     if(!LL_GPIO_IsInputPinSet(BUTTON_EXTI13_GPIO_Port, BUTTON_EXTI13_Pin))
127     {
128         LL_GPIO_SetOutputPin(LED2_GPIO_Port, LED2_Pin);
129     }
130     else
131     {
132         LL_GPIO_ResetOutputPin(LED2_GPIO_Port, LED2_Pin);
133     }
134     /* USER CODE END WHILE */
135
136     /* USER CODE BEGIN 3 */
137   }
138   /* USER CODE END 3 */
```

Step 11. If the blue button is pushed, turn on the LED2, else, turn it off

Embedded C Assigment 2.ioc | main.c

```
89
90    /* USER CODE END Init */
91
92    /* Configure the system clock */
93    SystemClock_Config();
94
95  /* Configure the peripherals common clocks */
96    PeriphCommonClock_Config();
97
98    /* USER CODE BEGIN SysInit */
99
100   /* USER CODE END SysInit */
101
102   /* Initialize all configured peripherals */
103   MX_GPIO_Init();
104   MX_DFSDM1_Init();
105   MX_I2C2_Init();
106   MX_QUADSPI_Init();
107   MX_SPI3_Init();
108   MX_USART1_UART_Init();
109   MX_USART3_UART_Init();
110   MX_USB_OTG_FS_PCD_Init();
111   /* USER CODE BEGIN 2 */
112   uint32_t flashSize = LL_GetFlashSize();
113   uint32_t deviceID0 = LL_GetUID_Word0();
114   uint32_t deviceID1 = LL_GetUID_Word1();
115   uint32_t deviceID2 = LL_GetUID_Word2();
116   (void) flashSize;
117   (void) deviceID0;
118   (void) deviceID1;
119   (void) deviceID2;
120   /* USER CODE END 2 */
121
122   /* Infinite loop */
123   /* USER CODE BEGIN WHILE */
124   while (1)
125   {
126     if(!LL_GPIO_IsInputPinSet(BUTTON_EXTI13_GPIO_Port, BUTTON_EXTI13_Pin))
127     {
128         LL_GPIO_SetOutputPin(LED2_GPIO_Port, LED2_Pin);
129     }
130     else
131     {
132         LL_GPIO_ResetOutputPin(LED2_GPIO_Port, LED2_Pin);
133     }
134     /* USER CODE END WHILE */
135
136     /* USER CODE BEGIN 3 */
137   }
138   /* USER CODE END 3 */
```

Step 12. Right click on the project name and build it, test the .elf file, also examine the RAM and FLASH size



Step 13. Setup for debug configuration, test on the board. If you press the blue button, the LED will be on