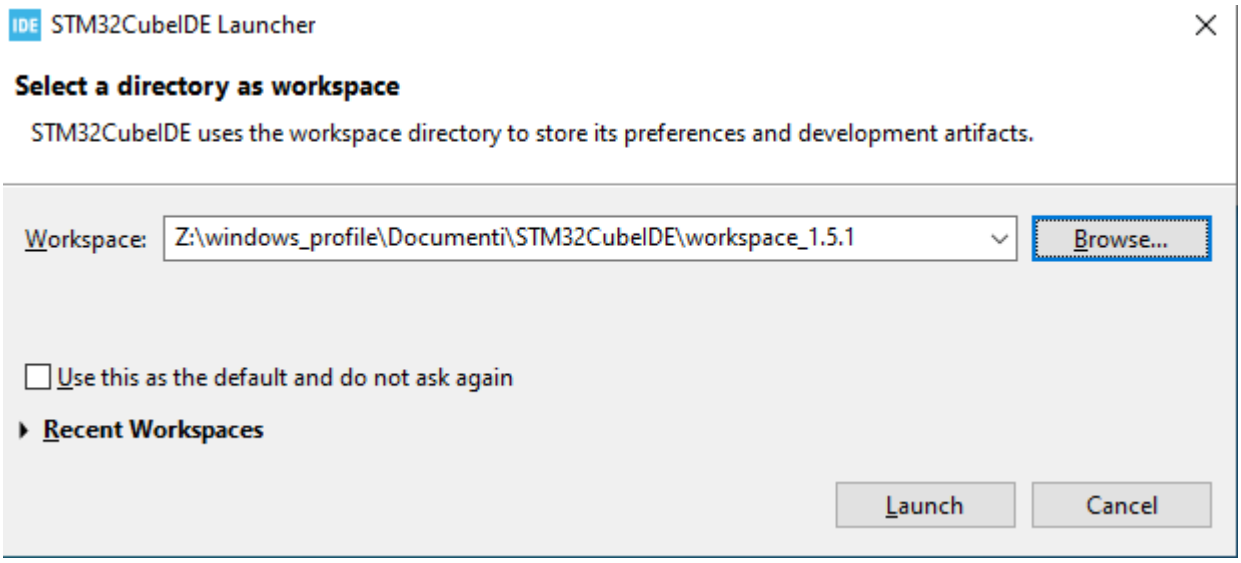
ERTC Laboratory

Preliminary Configurations

Select a location for the workspace

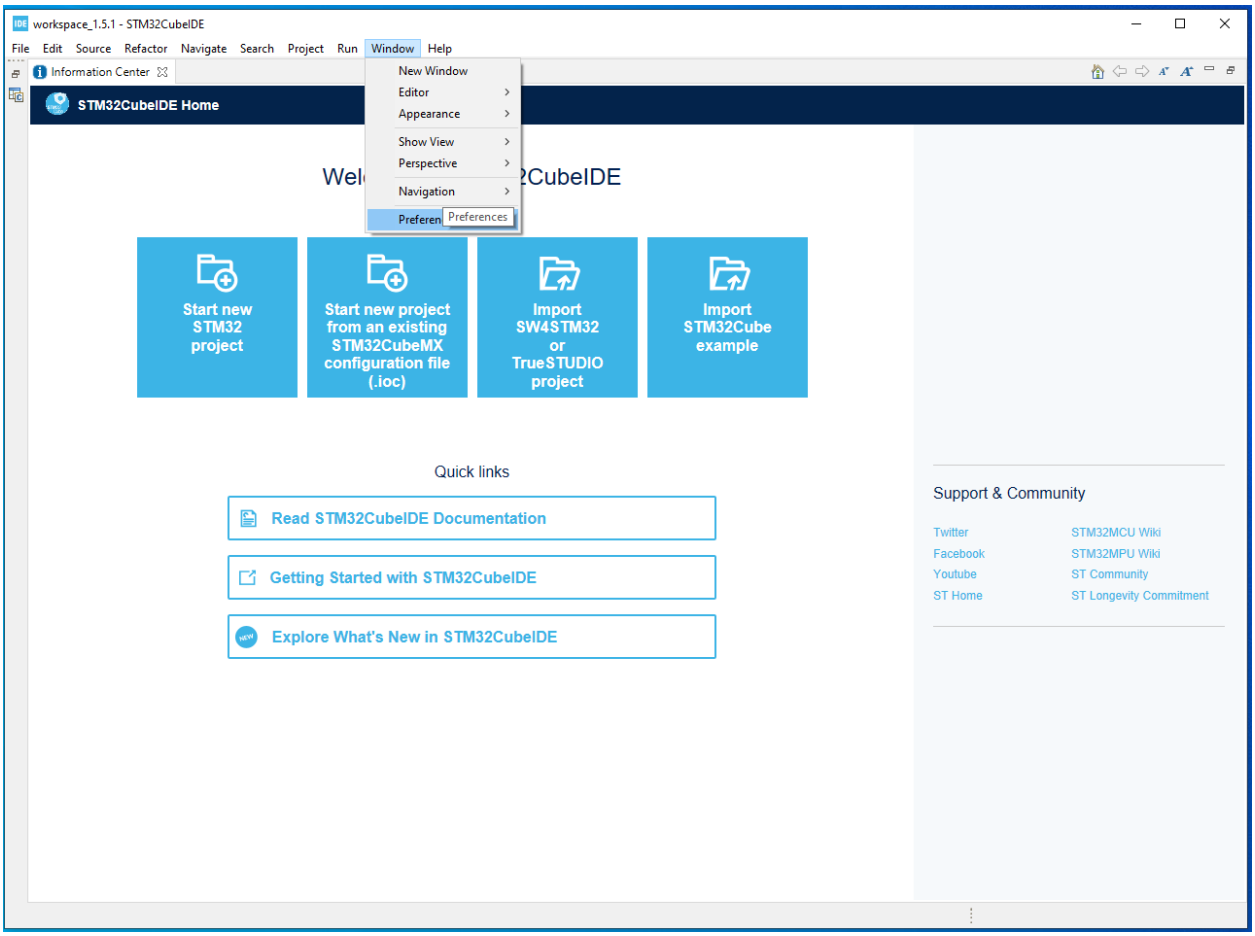
The first time you start STM32CubeIDE, you are going to be asked to select a directory as a workspace. The workspace is the location where your code is placed. Select the location as showed on the image below (should be part of your remote user directory):



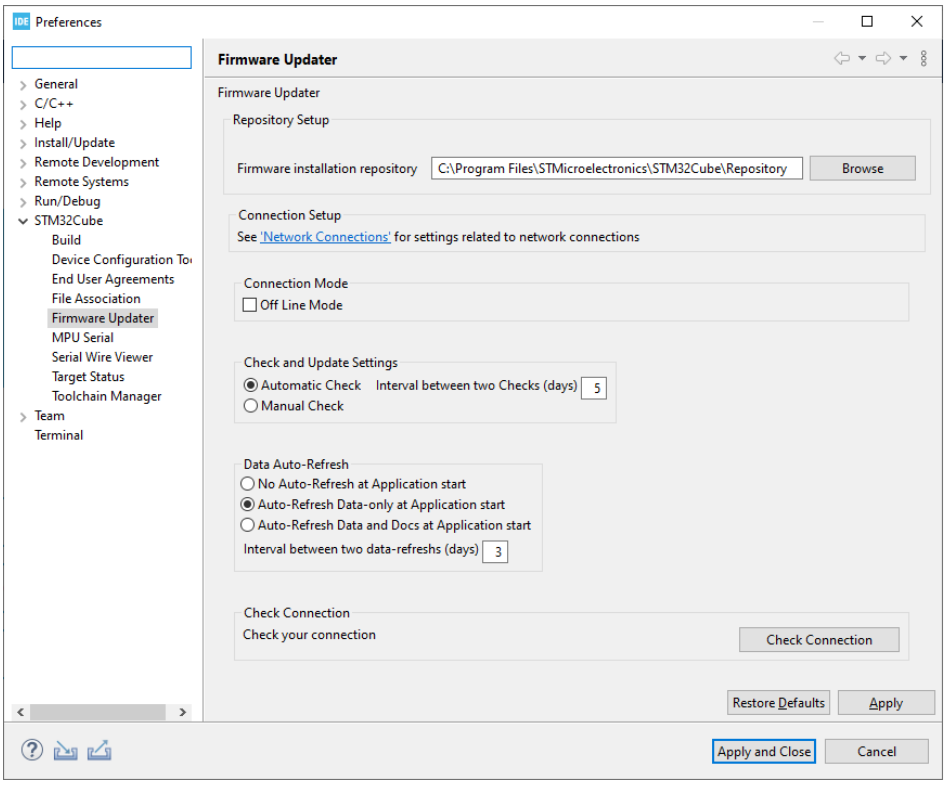
Select the correct repository

Before you create a project, it is appropriate to select the proper repository; in this context, a repository is the location where libraries and other tools are installed. The images below describes the step needed to select the correct repository.

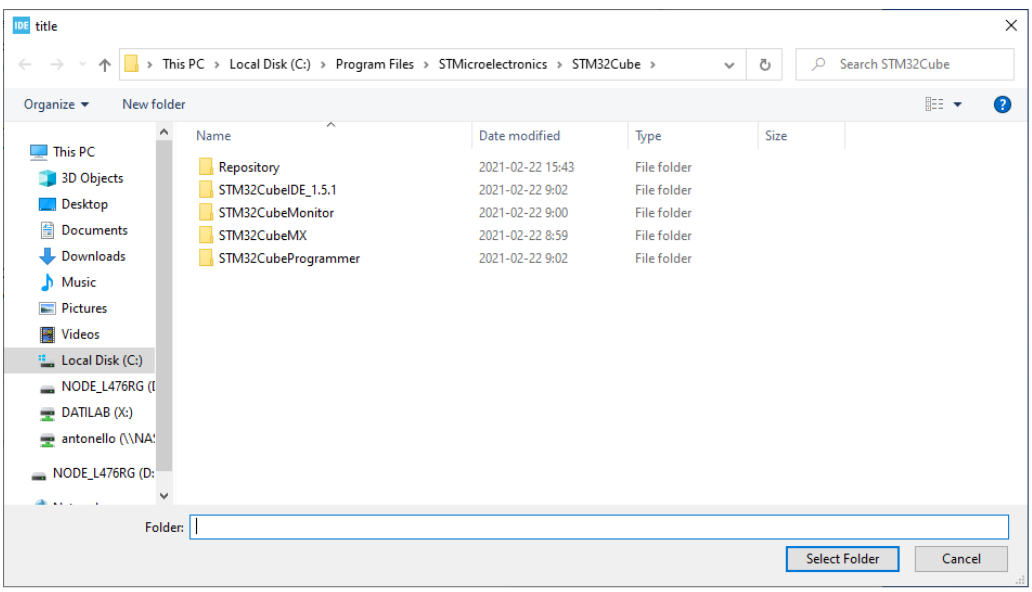
1. Open STM32CubeIDE and select **Window->Preferences** from the Menu bar;



2. Go to the **STM32Cube > Firmware Updater** section and make sure that **Firmware installation repository** is set to the path that you can see from the picture below;

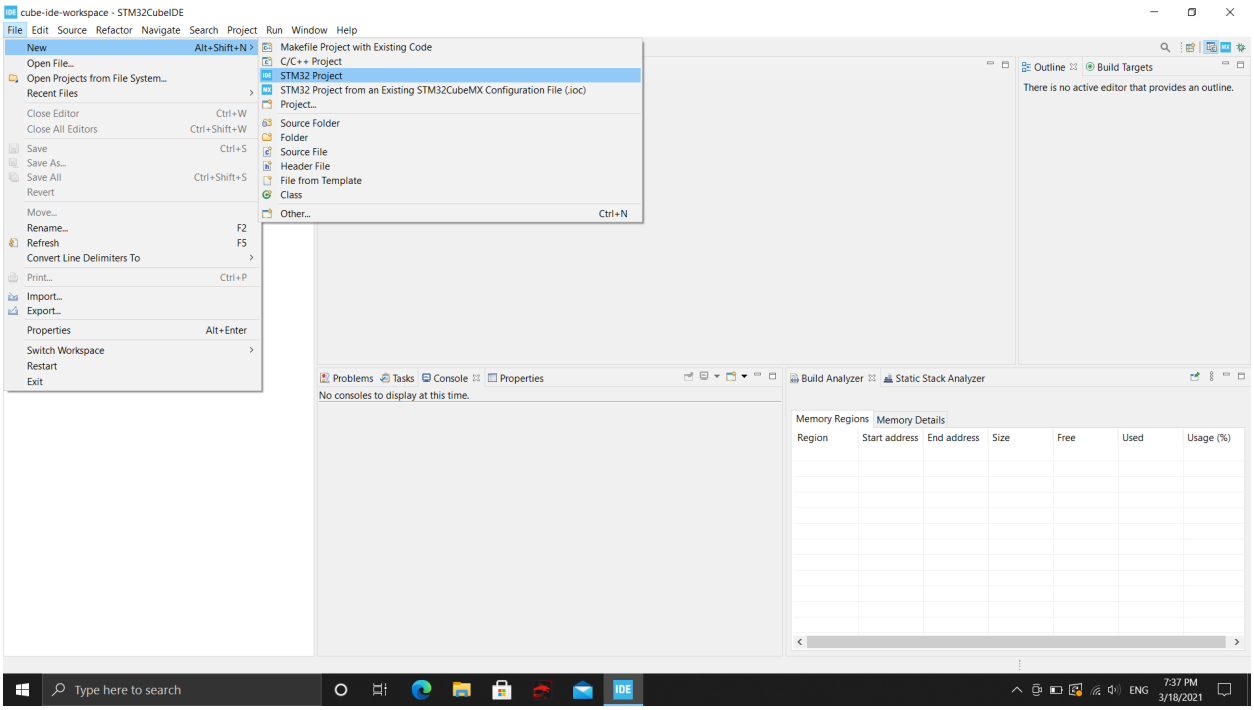


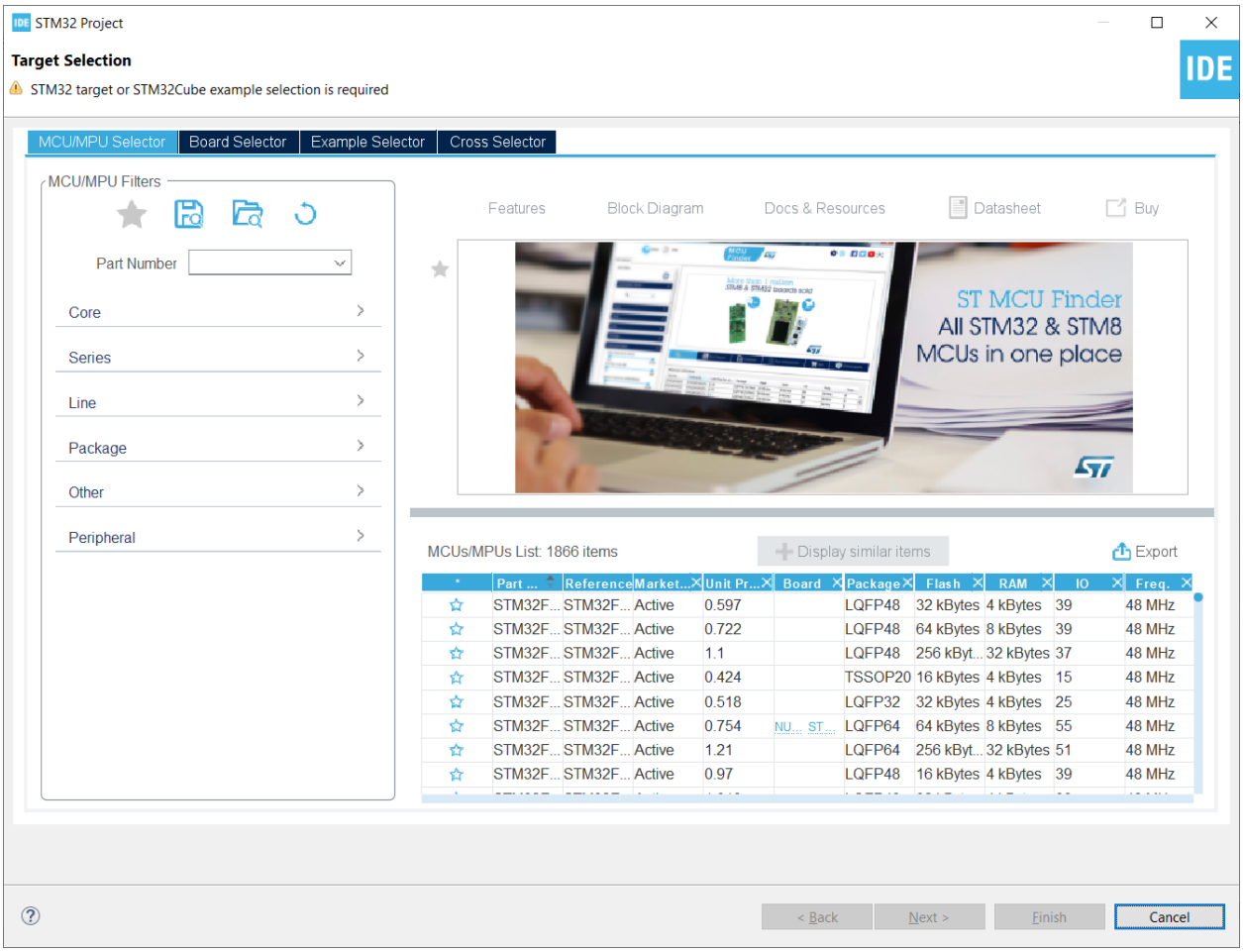
3. If the configuration described in the previous point is not properly setup please fix the configuration, selecting the correct repository location



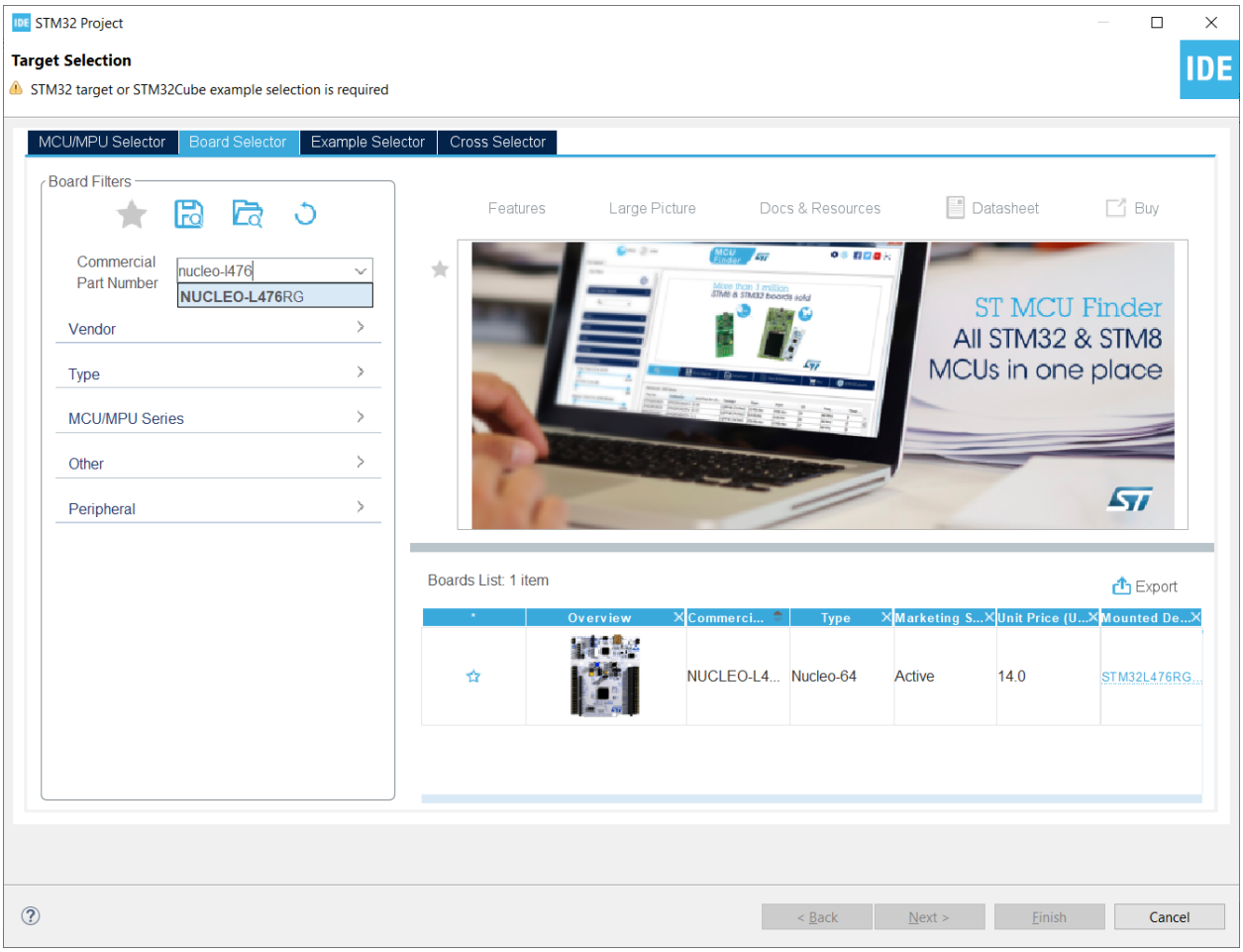
Create a new project

1. After having selected **File -> New -> STM32 Project** from the Menu bar, the STM32 Project interface pops.

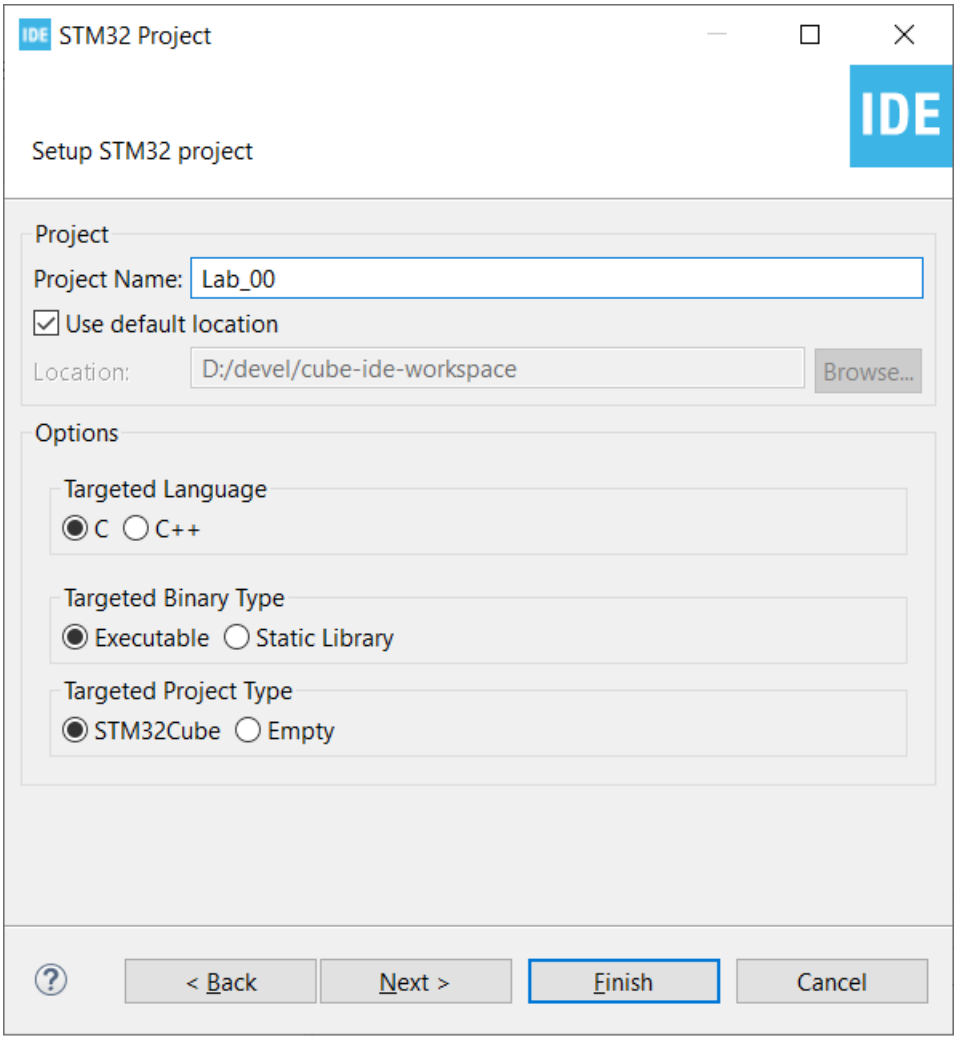




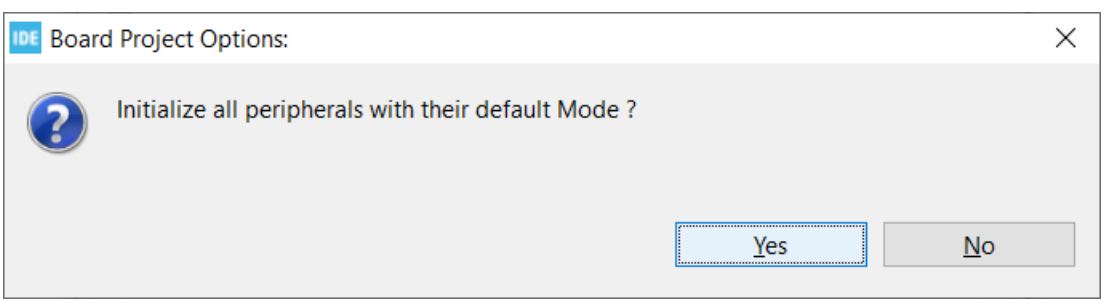
2. Go to the Board Selector tab and select the board, in our case Nucleo-l476rg; after this, click Next.



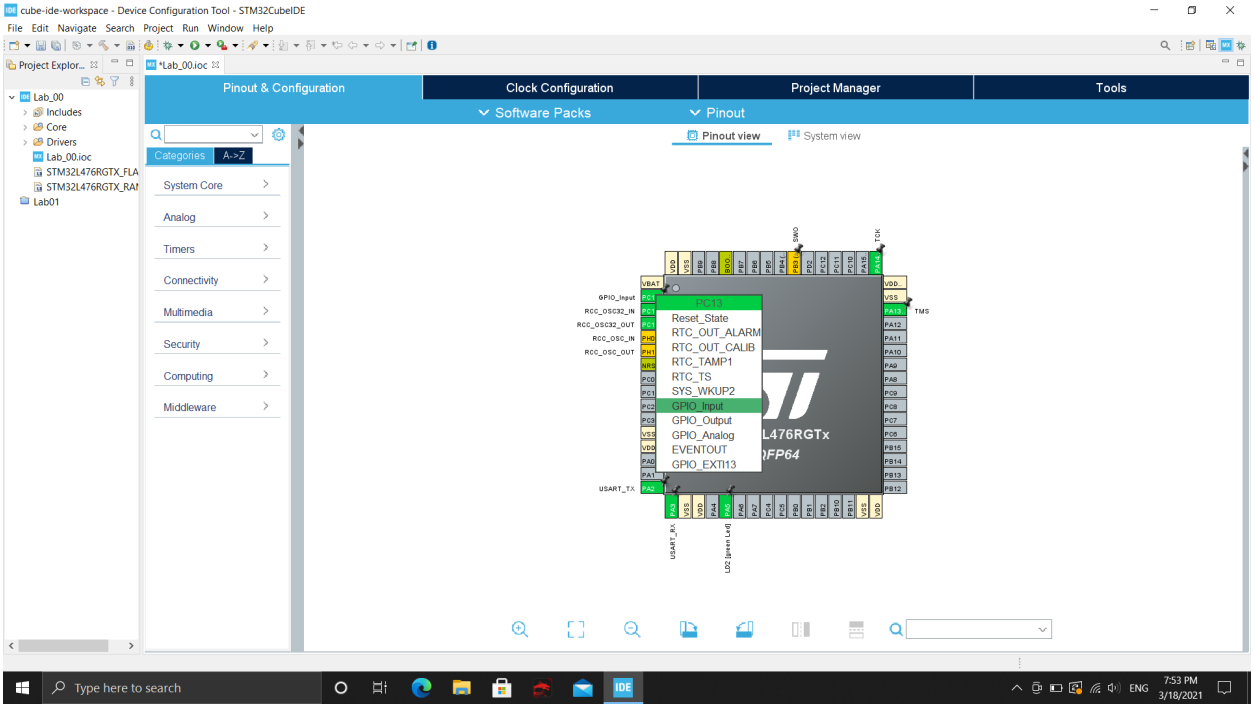
3. Your are prompted to specify a Project Name: you can assing the name that your prefer here.



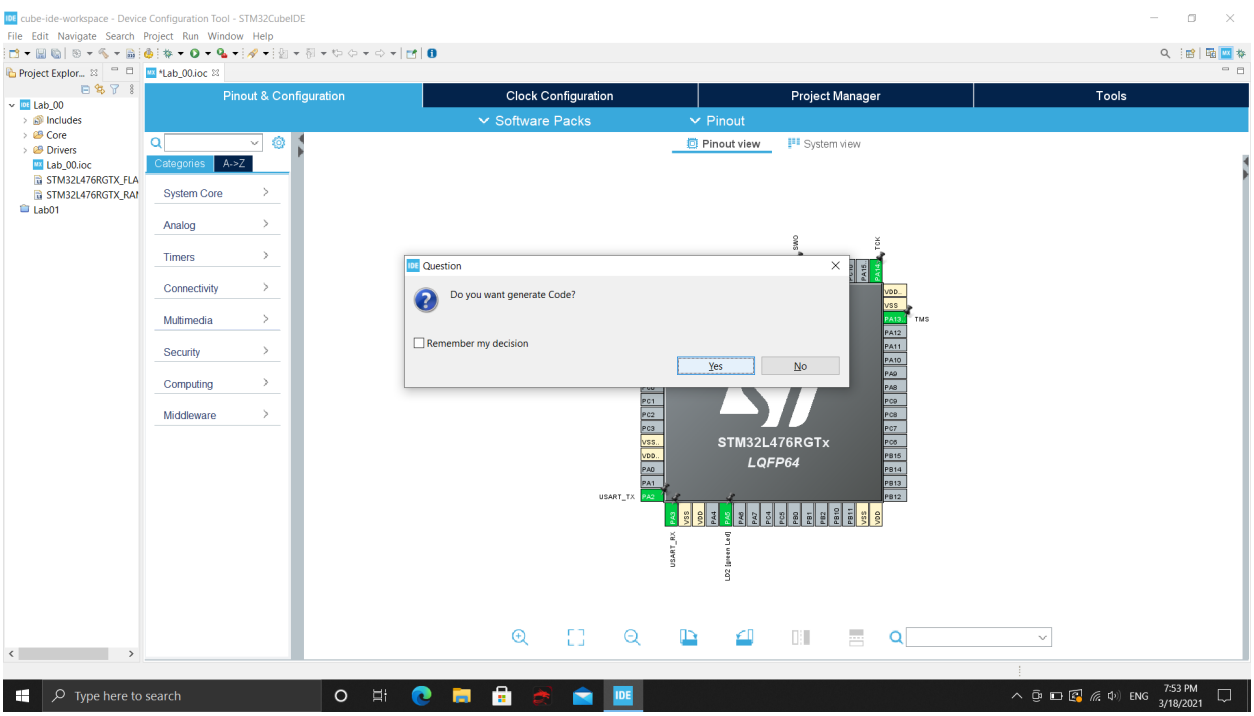
4. Initialize all the peripherals with their default mode for the selected board



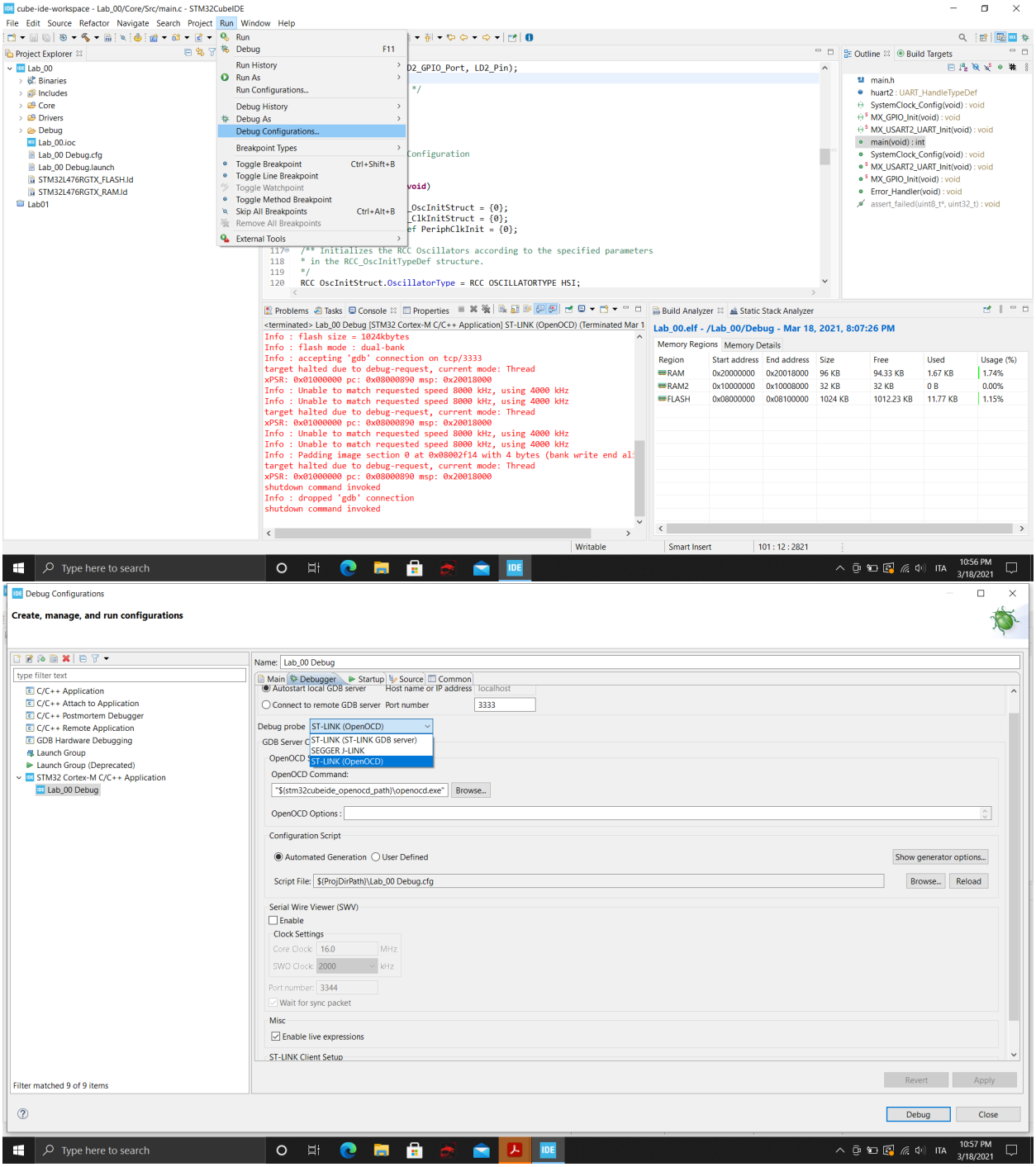
5. Assign the function “GPIO_Input” to the “PC13” pin



6. Saving the project (CTRL + S) trigger the code generation



Configure the debugger



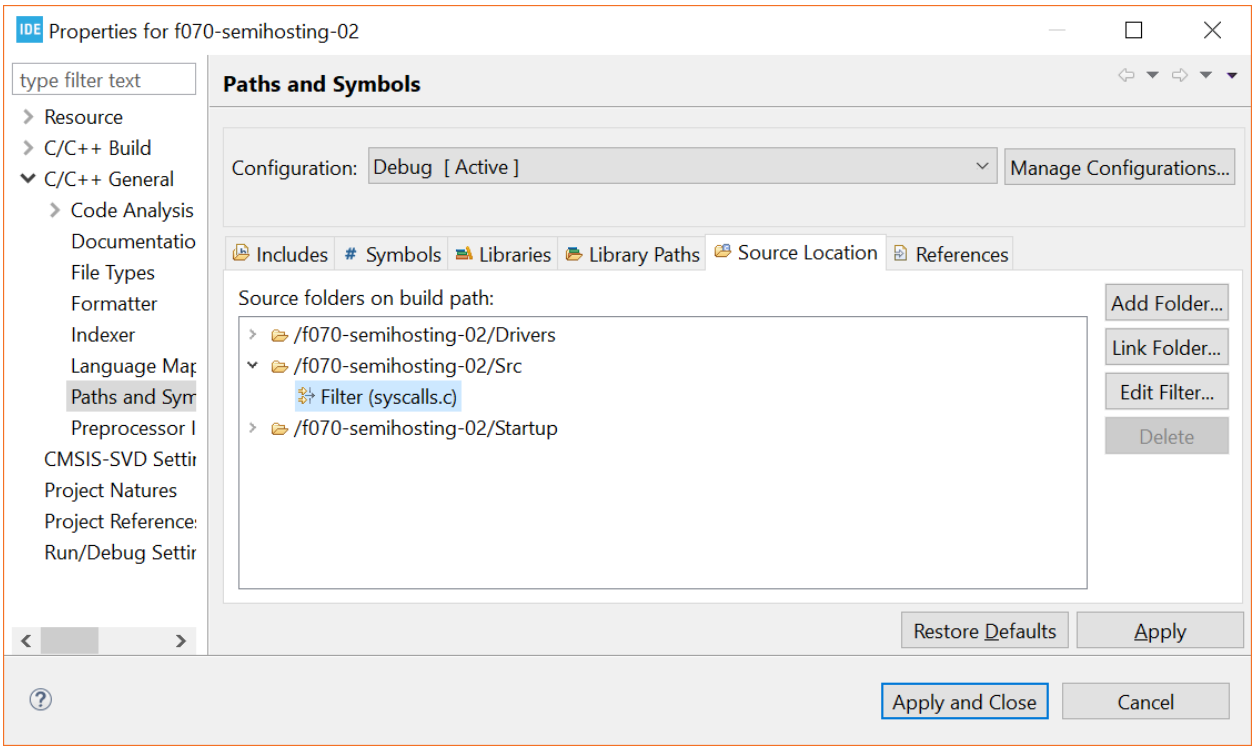
Use debug print

Debugger and libraries configuration

This guide is taken from https://shawnhymel.com/1840/how-to-use-semihosting-with-stm32/

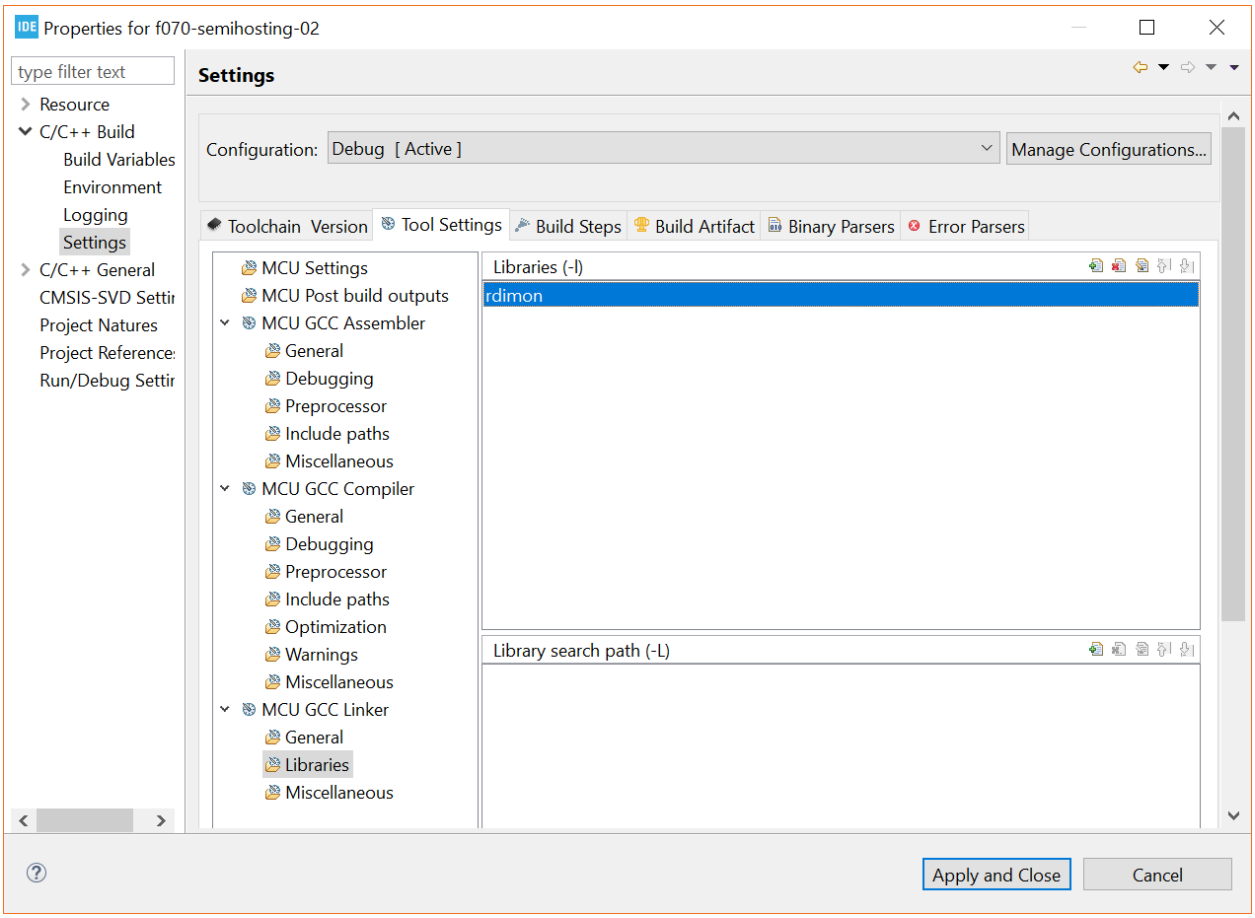
To start, go to Project > Properties.

Go in to C/C++ General > Paths and Symbols. Click on the Source Location tab. Click on the arrow next to //Src to view the filter. Select Filter (empty) and click the Edit Filter... button. Add syscalls.c to the Exclusion patterns list and click OK.



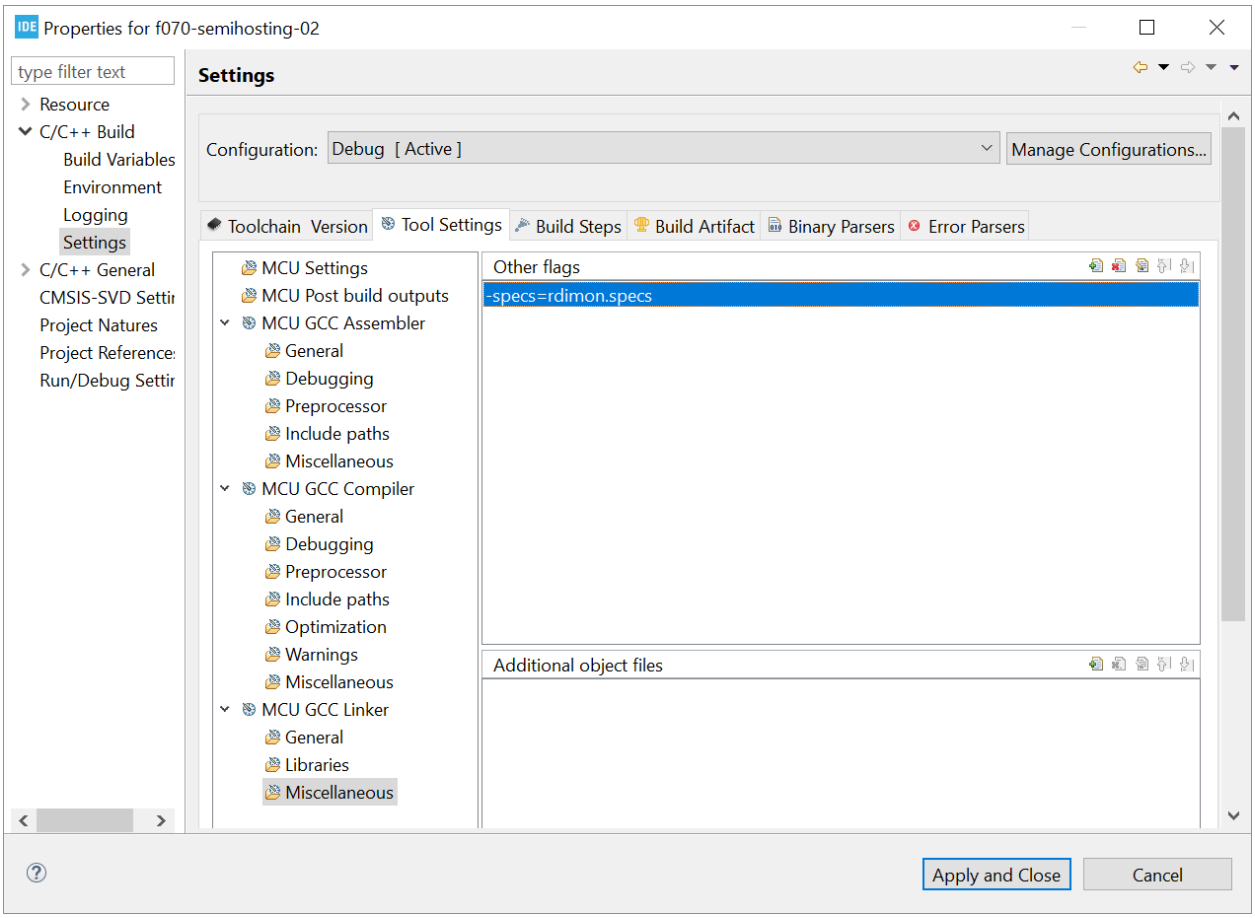
Click Apply.

On the left-side pane, go into C/C++ Build and select the Tool Settings tab. Then, select MCU GCC Linker > Libraries. In the libraries pane, click the Add... button and enter rdimon. This enables librdimon for us to make system calls with semihosting.



Next, click on MCU GCC Linker > Miscellaneous while still in the Tool Settings tab. Click the Add... button and enter –specs=rdimon.specs into the dialog box.

Open Src/main.c. Above int main(void) , add the following line (I put mine in the USER CODE 0 section):



Printf Code

```
extern void initialise_monitor_handles(void);
```

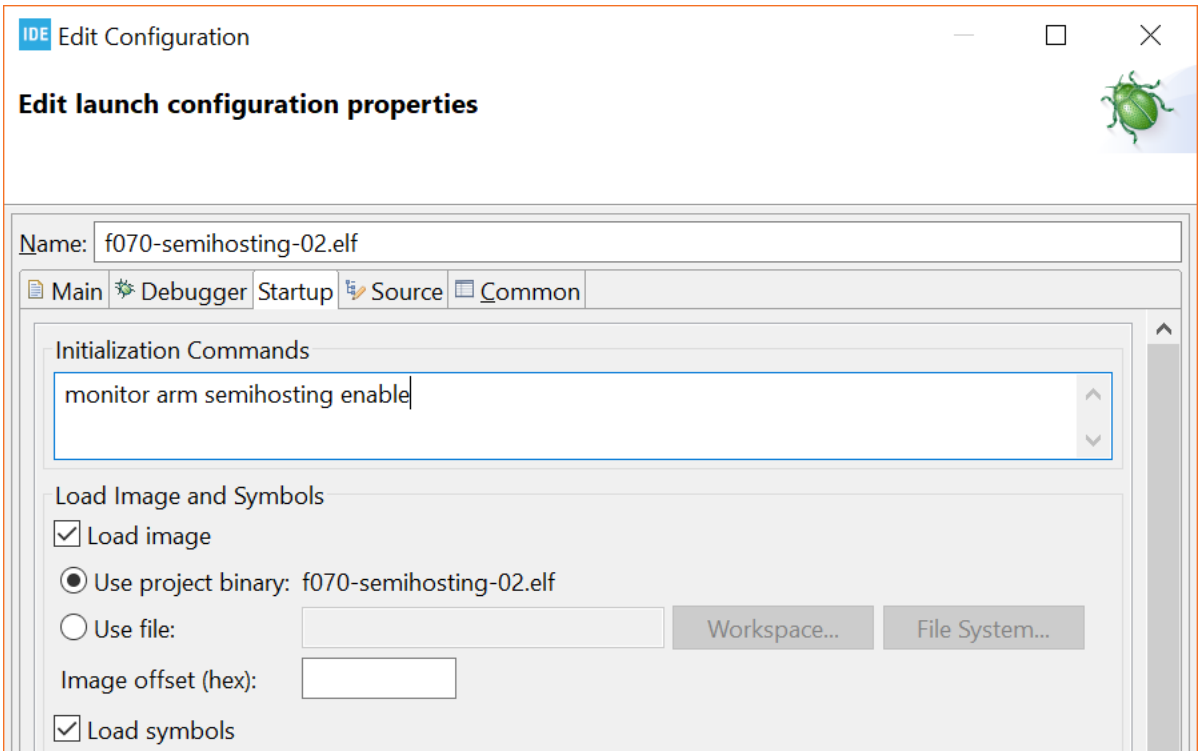
In `int main(void)` (before the `while(1)` loop), add the following line (I put mine in the USER CODE 1 section):

```
initialise_monitor_handles();
```

Finally, inside the `while(1)` loop, add the following:

```
printf("Hello, World!\n");
HAL_Delay(1000);
```

Set Debug Configuration



Installing and running your code

Flashing is the act of installing your code into the flash of the microcontroller;

- Flash the board and start a debug session by pressing the button on the IDE;

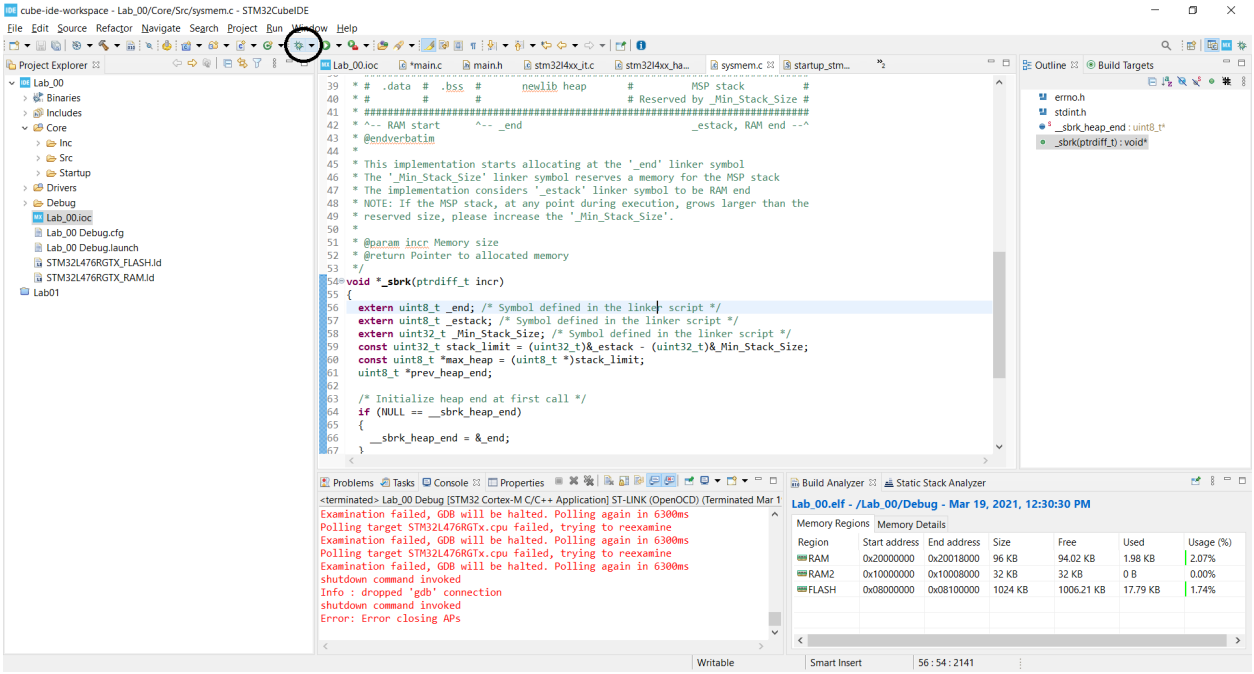
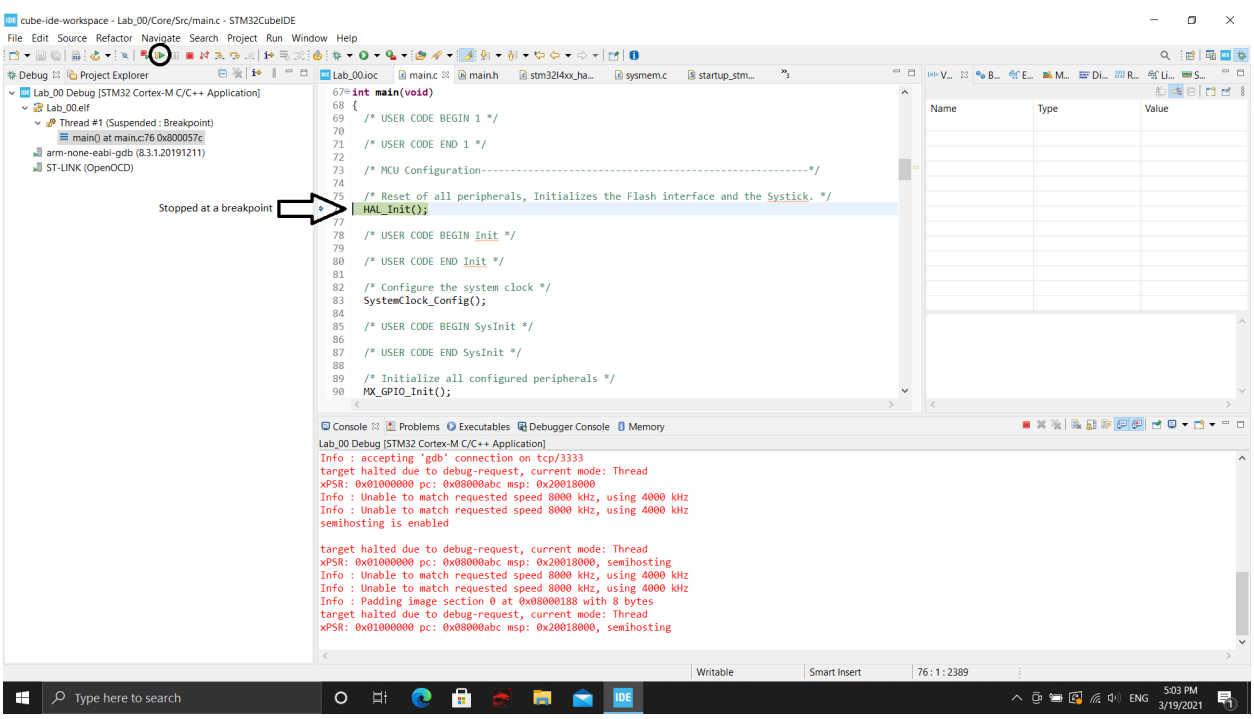


Figure 1: Debug button

- The code blocks on a breakpoint at startup, press the button to resume the execution;



* In debug mode you can pause the execution or put breakpoints to stop the program if the execution meet the breakpoint: this can be very useful if you need to investigate a problem in your code;

Access to your code

- If you have a DEI account, you should be able to login into your home directory by connecting, via ssh, to `login.dei.unipd`;
- Alternatively, you can copy the code into a pendrive;
- If you know how to to that, you are free to use versioning tools like, for example, **git** or **SVN**;

Suggestions:

- Auto completion: you can auto complete the code by using the "CTL + Spacebar" key combination;
- Keep the API reference open;
- You can use multiple files;
- Use the schematics to understand how the button and the led should work;
- Write code inside the blocks like:

```
/* USER CODE BEGIN ... */

/* USER CODE END ... */
```

this way the code will be preserved in case you change something in the project