EE3220 System-on-Chip Design

Tutorial 1: Get Started with ARM Mbed Platform

Objective:

- **To gain Hands-on experience and get familiar with the ARM Mbed tools.**
- **To register your own ARM Mbed account on.**
- **To get familiar with the function and development cycle of ARM.**

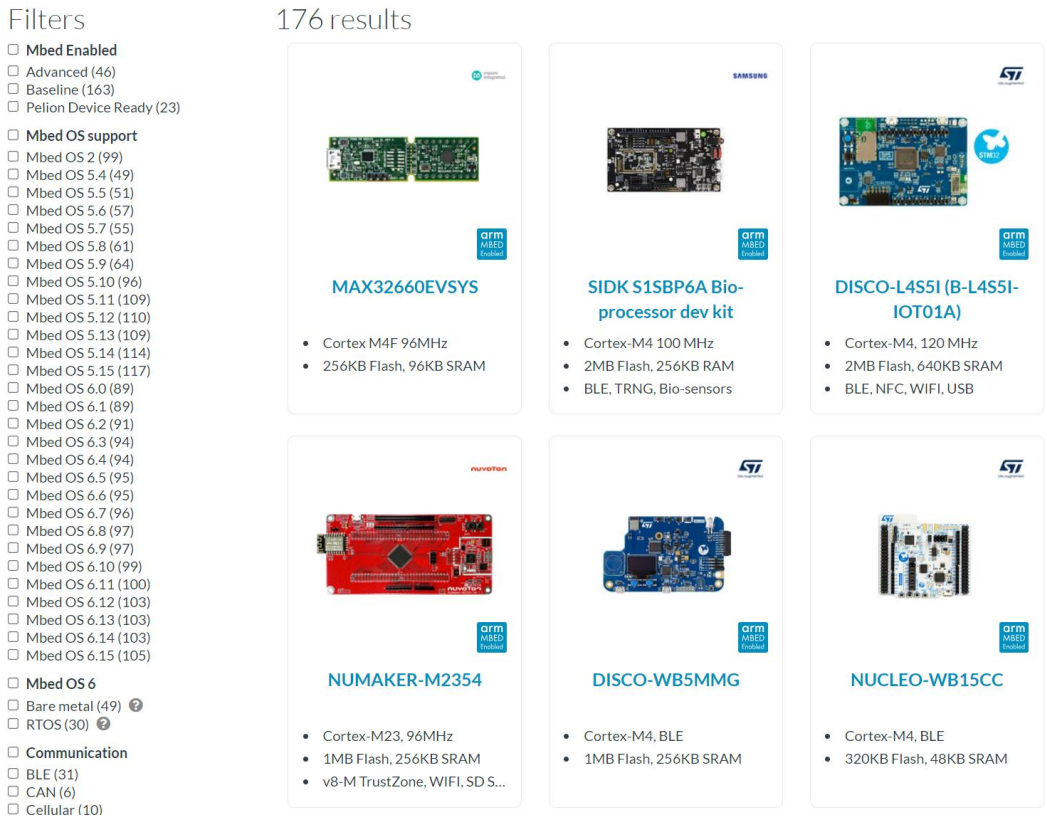
In this tutorial, we are going to explore and learn about the ARM Mbed, an online development platform for ARM microcontrollers. You need to register your account and get familiar with the procedure for using the ARM development tools.

Introducing the ARM Mbed Platform

Arm® Mbed is a free online ARM compiler that can be used over an Internet link. It is an IDE platform and operating system based on 32-bit ARM Cortex-M microcontrollers. It is collaboratively developed by ARM® and its technical partners. Mbed is currently supported by over 60 partners and a community of 200,000 developers. It also provides the operating system, cloud services, tools, and developer ecosystem to make the creation and deployment of IoT solutions possible. Using Mbed we can write a program in C/C++, then compile the program, and upload the executable code to the target ARM processor. The advantage of using Mbed is that it is easy to learn and use and is supported by very large number of library functions. One of the major features of the Arm® Mbed™ systems is its web-based development environment. Just plug the device into computer using a USB cable, which will appear on your computer as a USB memory stick. Write and compile your software code using the Arm® Mbed™ Online Compiler, download the compiled code into the device, and press the onboard reset button to run!

1. Supported boards

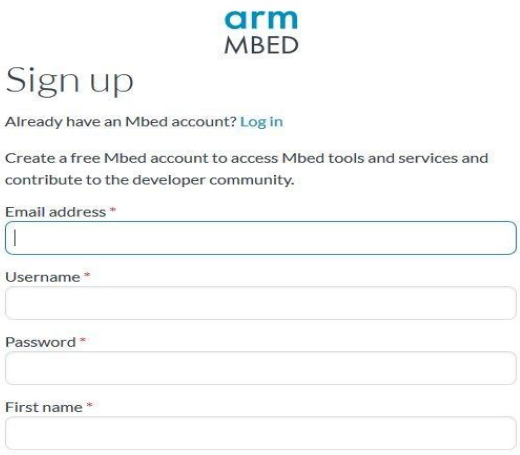
Mbed platform was initially created for mbed NXP LPC1768 microcontroller board. With its vast open source community and partnership and technical support, many vendors now create Mbed enabled microcontroller boards. Such boards are configured and programmed on the Mbed platform besides their proprietary platforms and other IDEs. Currently, Mbed platform supports about 176 boards including four of the STM32 Nucleo boards.



2. Registration for using the Mbed platform

Now you need to register and create a login account for the Mbed platform.

- Go to the Mbed platform website https://os.mbed.com/account/login
- Fill in the short form and click sign up.



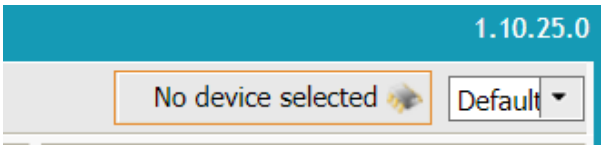
- Go to your email and confirm the registration

3. Getting familiar with Mbed platform

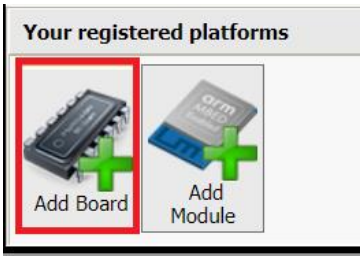
Now you need to log in to your account and choose a board.

- Go to the Mbed platform website https://os.mbed.com/account/login
- Click **Compiler** button at the top right hand side of the page.

- Click “No device selected” button at the top right hand side of the page.

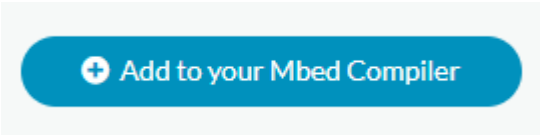


- click **Add Board** button, a new page will open on your browser.

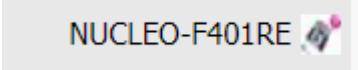


- Search for the board **F401** and click finish.
- Click the board.

- Click Add to your Mbed Compiler.



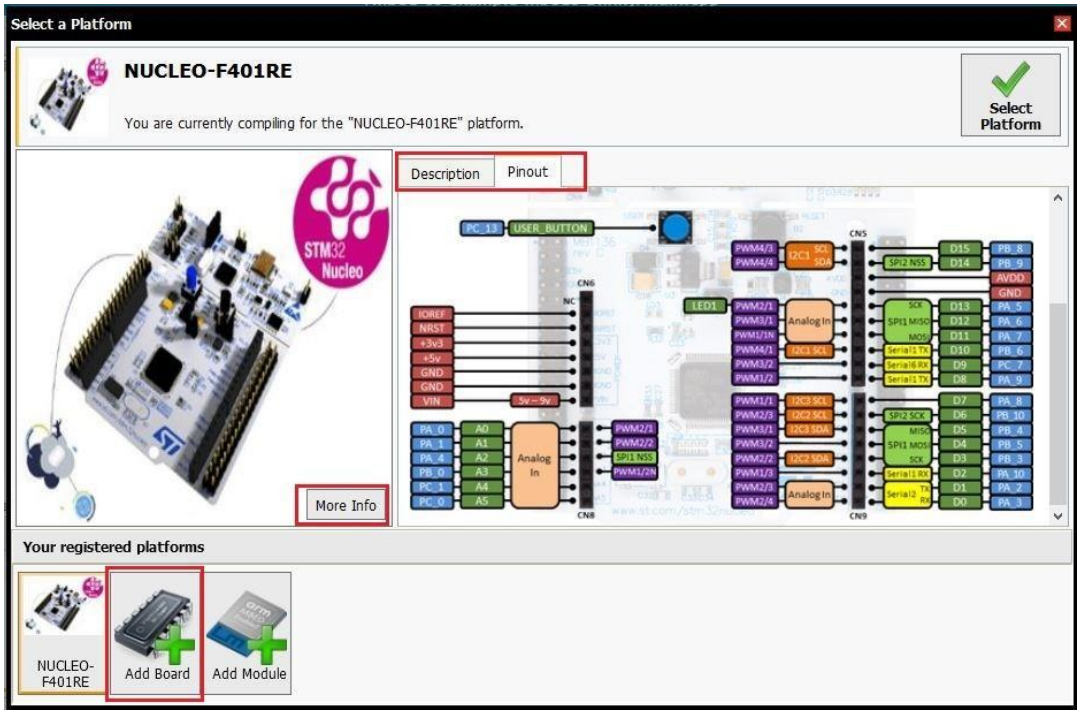
- Find the board is selected on your compiler page.



Now we will see how to add or remove a platform (a board).

- At the top right-hand corner of the environment, click the current board **(NUCLEO-F401RE).**

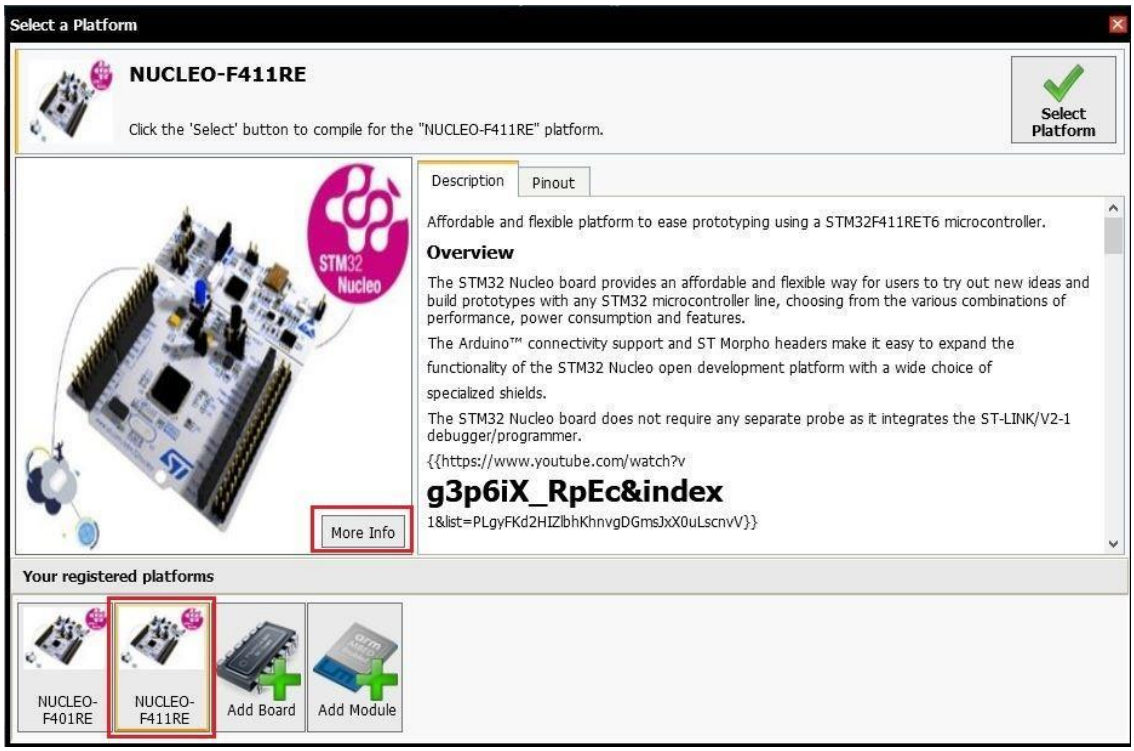
- Click Description then Pinout tabs to learn about the current board



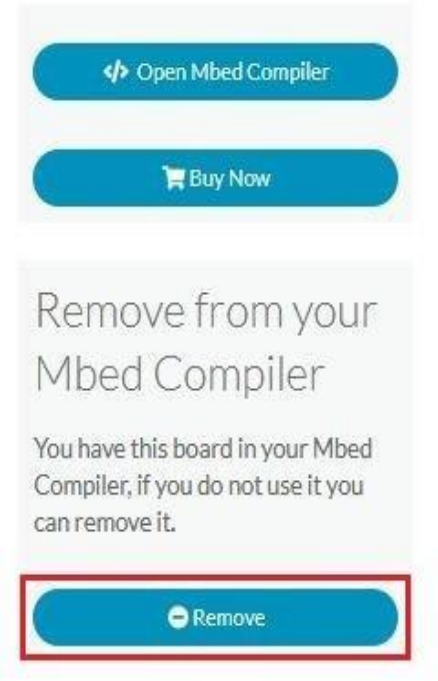
- To add new board, click **Add Board** button, a new page will open on your browser.
- Search for your new board. Now search Nucleo-F11RE board and click on the board.

- Click **Add to your Mbed compiler**, the board will be added to your account.

- Now we will delete the board added. From the Compiler environment click at the current board **(NUCLEO-F401RE)** to open the boards interface.
- Select NUCLEO-F11RE and click More info.



- From the board's info page now select **Remove.**



- Now the board will be removed from your Mbed account. Follow the same procedure outlined above to add or remove the same or another board to your account. Read and learn more information about different ARM boards.

4. Using the Mbed platform

Mbed is a free online IDE consisting of an online code editor, a compiler, and a program upload tool. Only a web browser is required to access Mbed and develop ARM-based programs. Programs are compiled on the Cloud using the ARM C/C++ compiler. Developing a project using Mbed is very easy since all the user needs is to pick an Mbed supported development board, write the application program, and then upload the program to the board. To use the Mbed IDE platform, follow the steps below:

(a) Go to the Mbed platform website and log in to your account.
https://os.mbed.com/account/login

(b) Create a new program, choose a platform board and import the library.

(c) Write your own program and compile.

(d) Download the generated file and run on board.

We will cover more details in the next tutorial and lectures!

PSoC 64 Secure Boot, Wi-Fi / BLE Pioneer Kit

NuMaker-IoT-M487

MultiTech Dragonfly Nano

NuMaker-LoRaD-M252

Future Electronics Sequana

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