



ESE516 CLOUD STARTER

Eduardo Garcia
Spring 2021



Annex – how to set up SAMW25 for access to Penn's HTTPS server

Intro

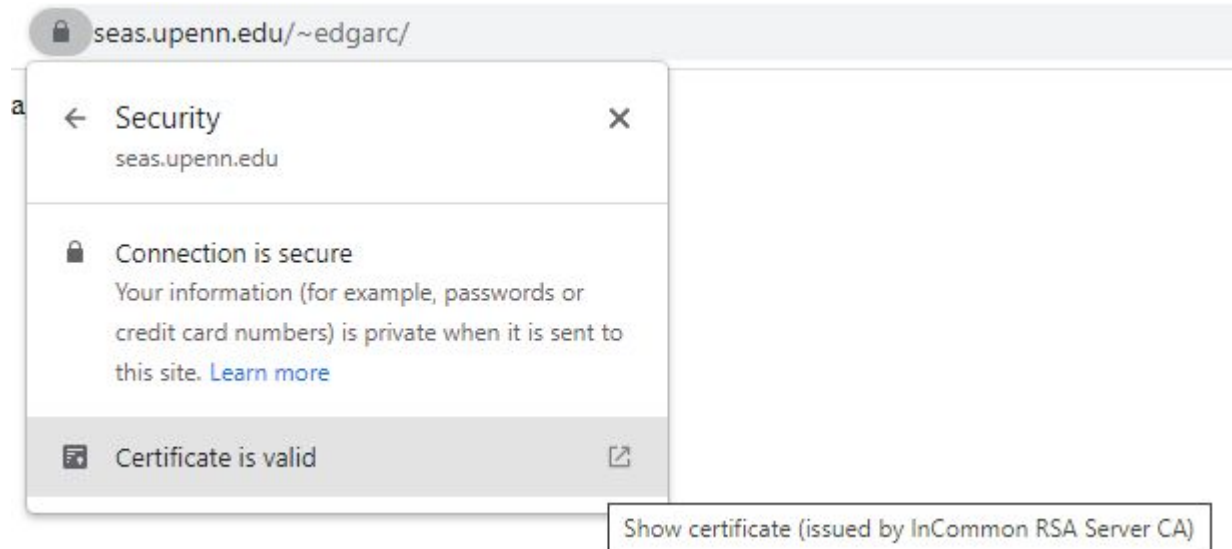
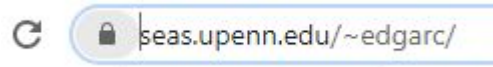
- These slides show the process to add the certifications needed for the SAMV25 to have access to files hosted in the SEAS webpage.
- This example will add the cert. for my webpage, but you should follow these steps to add it for yours!
- <https://www.seas.upenn.edu/~edgar/>

Intro

- 1.) Go to your website. In my example, it is:
- <https://www.seas.upenn.edu/~edgarc/>
- (Notice no file extension)

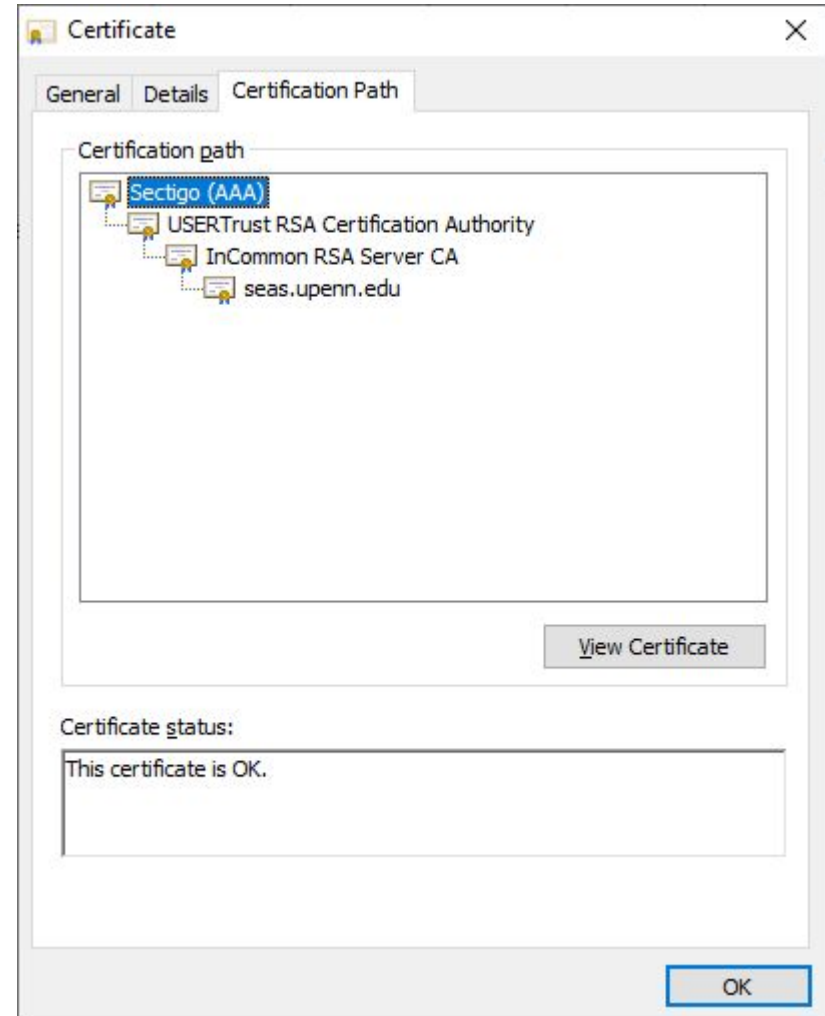
Intro

- On your browser there must be a way to download the certificate for the webpage.
- On Chrome : Click on the Lock Icon near the URL and click on certificate



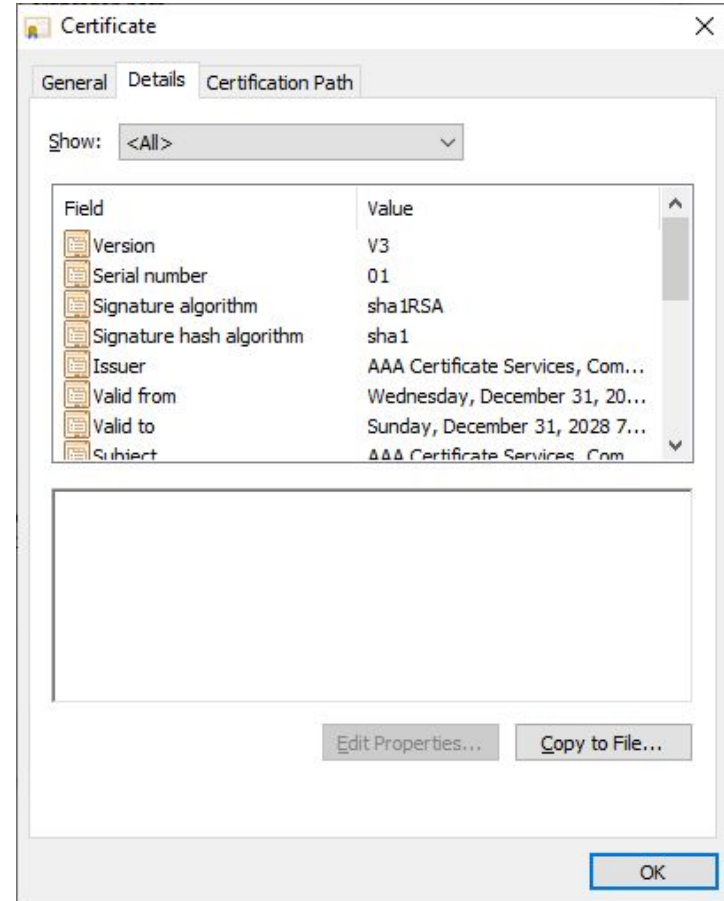
Intro

- Go to the Certification Path tab and click on the top certificate path. Then, click on “View Certificate”



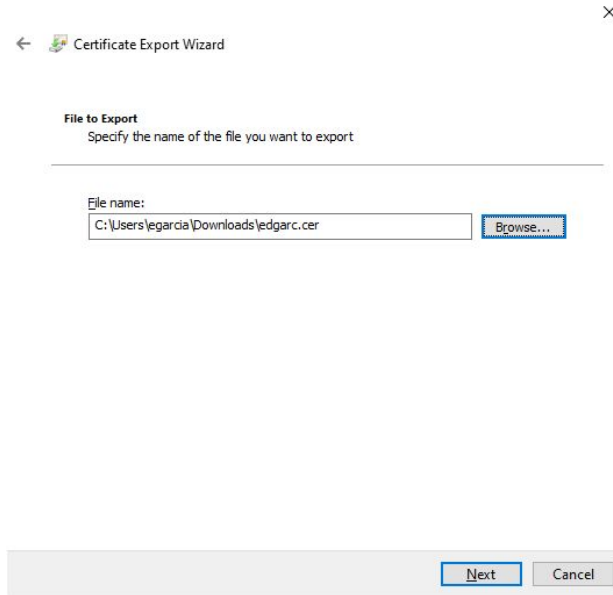
Intro

- On the new window that pops up, choose the DETAILS tab, click “Copy to File”



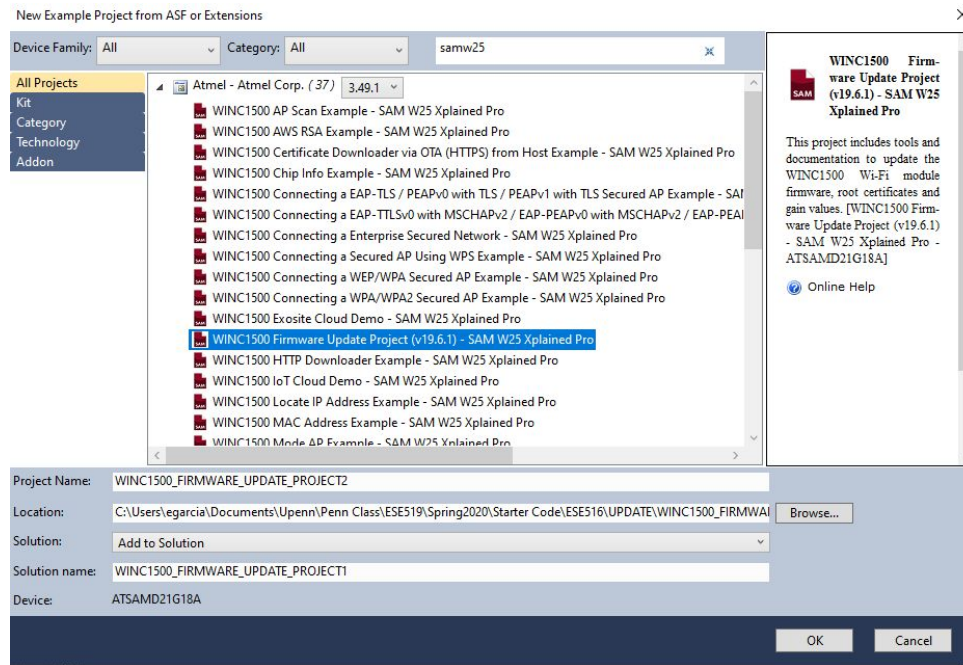
Intro

- Click Next and Next, going thru the default settings. Store your file with a short name – I recommend your Penn login



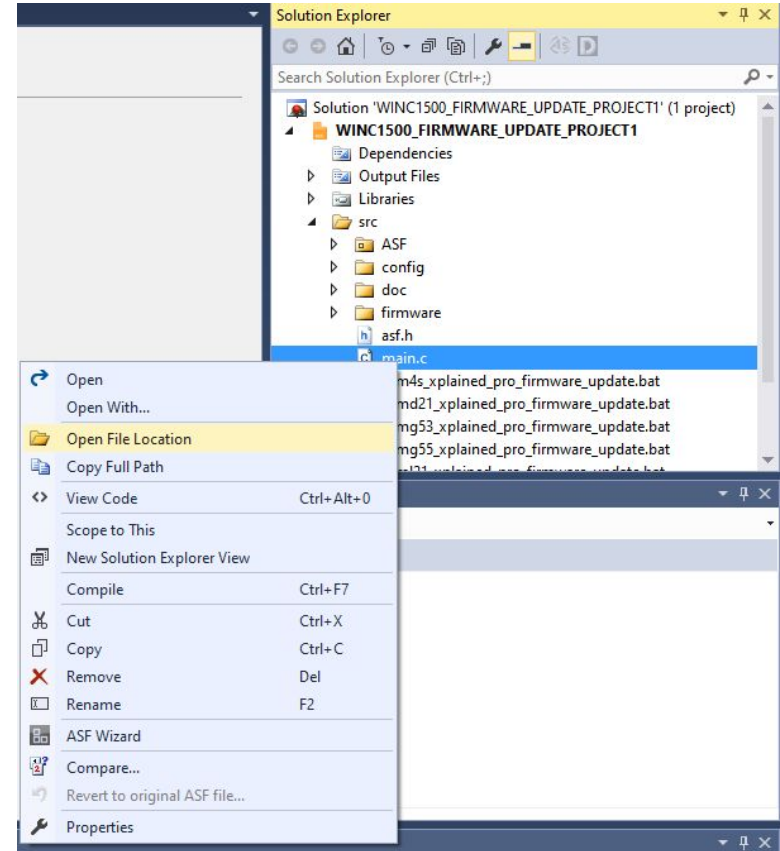
Intro

- Open Atmel Studio and generate a new SAMW25 Firmware Update project (**File->New->Example Project**). NOTE: Please make the project in a SHORT PATH. Long paths have made the batch file we have to run fail.

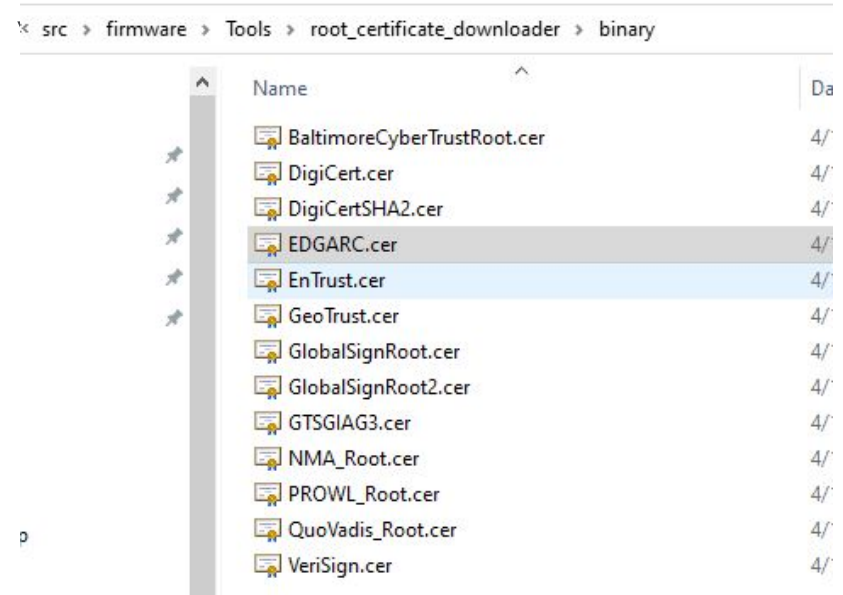


Intro

- Go to the folder of the project by right clicking “main.c” and selecting Open File Location



On the path
\firmware\Tools\root_certificate_downloader\bin
ary:
Copy the certificate of your



- Go thru the normal update procedure! With the certificate, the download should now work!

```
Retrieving flash image... .././././readback_flash.bin
Wrote flash image to .././././readback_flash.bin

Verifying...
***** Flash programming verified OK *****
***** Download worked *****
OK
#####
##                                     ##
##          #####          ##          ##
##          ##  ##  ##  ##  ##  ##  ##
##          ##  ##  ##  ##  ##  ##
##          #####  ##  ##  #####  #####
##          ##          #####  ##          ##
##          ##          ##  ##  ##  ##  ##
##          ##          ##  ##  #####  #####
##          ##          ##          ##
#####
Downloading ends successfully
Press any key to continue . . .
```




Annex – how to get Microchip Studio to FINALLY format code nicely!

Installing CLANG-FORMAT

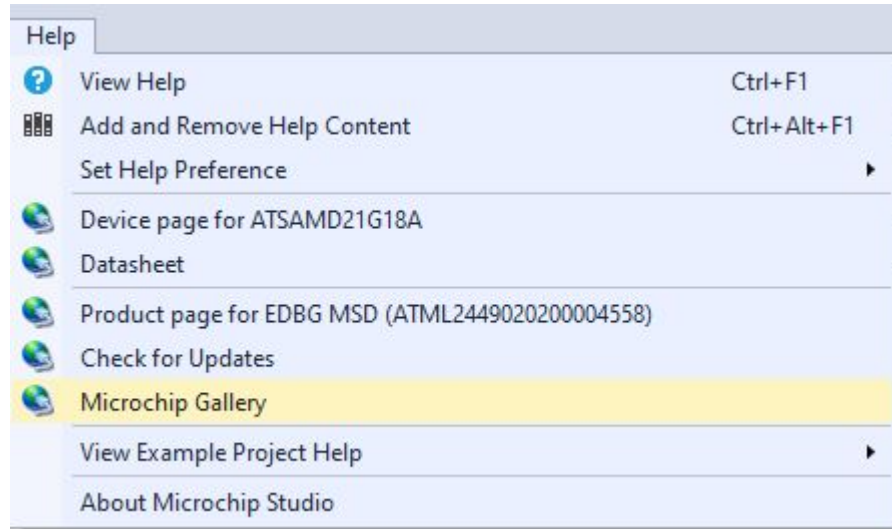
- Native format has not worked in Microchip studio since forever.
- Here we detail quality of life improvements to writing code

```
function register()
{
    if (!empty($_POST)) {
        $msg = '';
        if ($_POST['user_name']) {
            if ($_POST['user_password_new']) {
                if ($_POST['user_password_new'] == $_POST['user_password_repeat']) {
                    if (strlen($_POST['user_password_new']) > 5) {
                        if (strlen($_POST['user_name']) < 65 && strlen($_POST['user_name']) > 1) {
                            if (preg_match('/^[a-z\d]{2,64}$/i', $_POST['user_name'])) {
                                $user = read_user($_POST['user_name']);
                                if (!isset($user['user_name'])) {
                                    if ($_POST['user_email']) {
                                        if (strlen($_POST['user_email']) < 65) {
                                            if (filter_var($_POST['user_email'], FILTER_VALIDATE_EMAIL)) {
                                                create_user();
                                                $_SESSION['msg'] = 'You are now registered so please login';
                                                header('Location: ' . $_SERVER['PHP_SELF']);
                                                exit();
                                            } else $msg = 'You must provide a valid email address';
                                        } else $msg = 'Email must be less than 64 characters';
                                    } else $msg = 'Email cannot be empty';
                                } else $msg = 'Username already exists';
                            } else $msg = 'Username must be only a-z, A-Z, 0-9';
                        } else $msg = 'Username must be between 2 and 64 characters';
                    } else $msg = 'Password must be at least 6 characters';
                } else $msg = 'Passwords do not match';
            } else $msg = 'Empty Password';
        } else $msg = 'Empty Username';
        $_SESSION['msg'] = $msg;
    }
    return register_form();
}
```



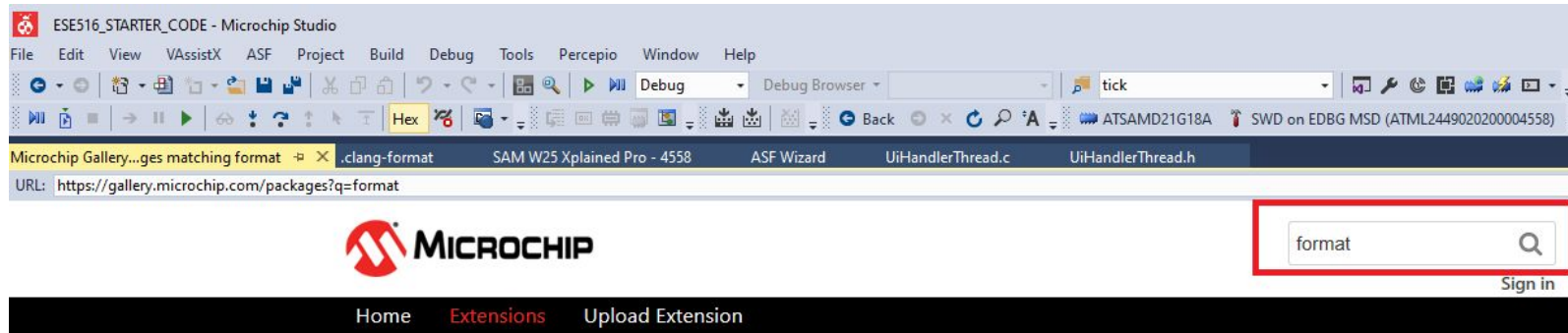
Installing CLANG-FORMAT

- We install Clang-Format



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Displaying results 1 - 5.

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ClangFormat By: meolsen

Last Published: 2018-05-04 | Latest Version: 7.0.0.330570

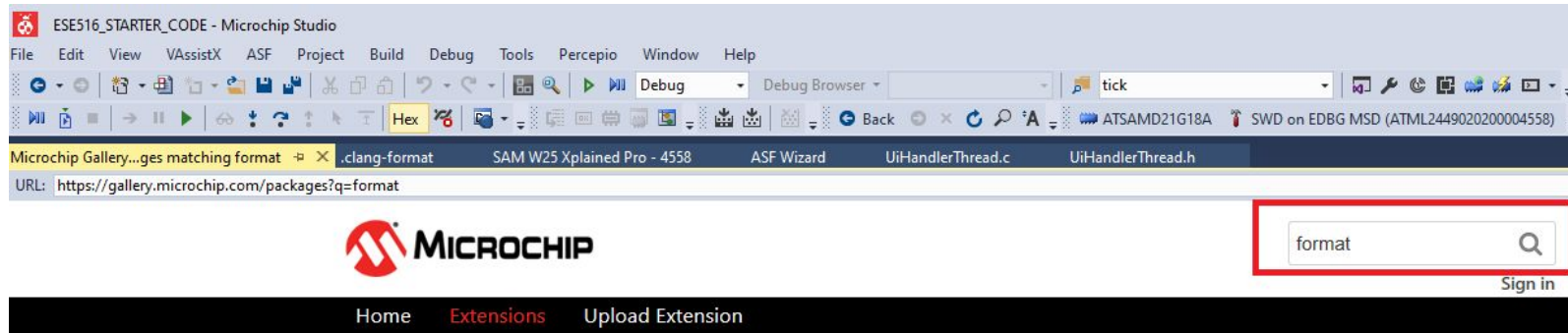
A tool to format C/C++/Obj-C code.

Supported Products: Atmel Studio 7.0

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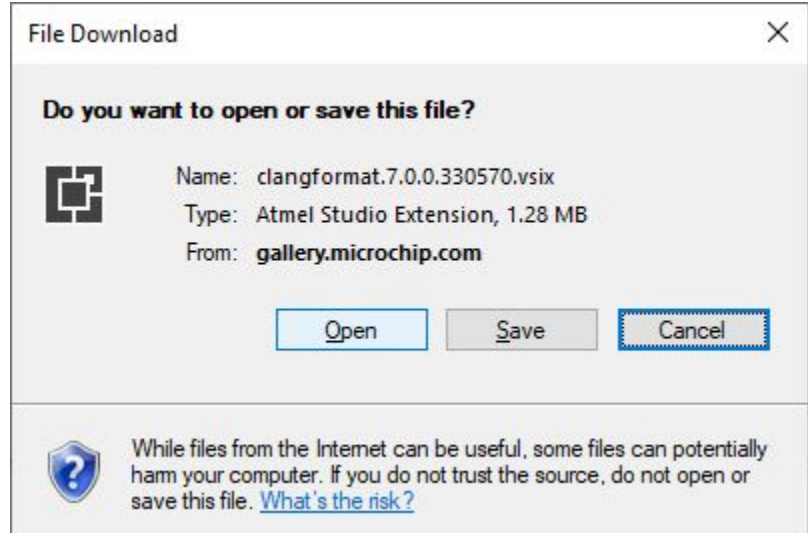
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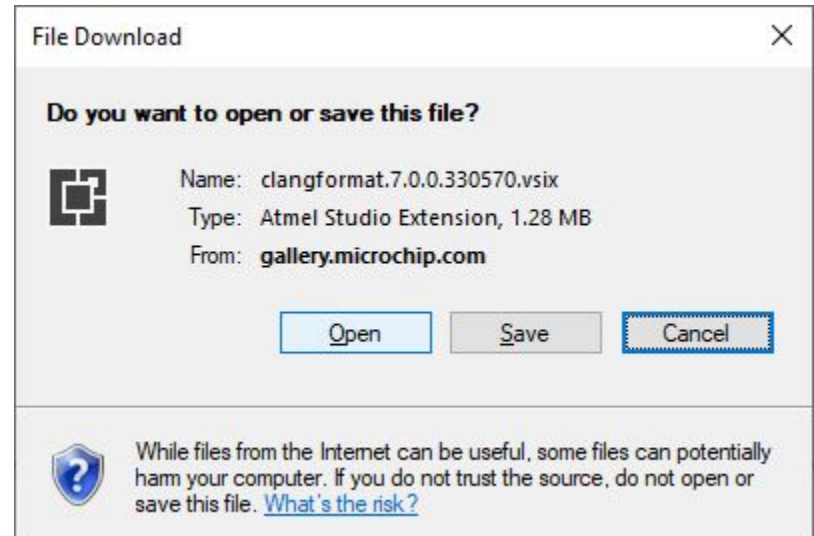
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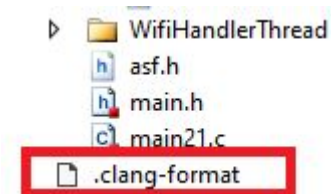
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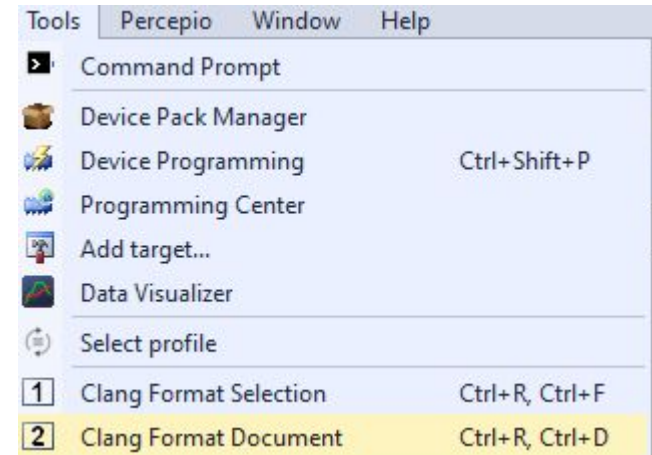
Installing CLANG-FORMAT

- Main project has a “.clang-format” file, which basically indicates the rules of formatting to Clang-format.
- It is added to the main and bootloader project. Since you are replacing the bootloader with yours, you would need to add this file to the bootloader project as well!
- Feel free to edit the clang-format to fit your need if you don't like this style! (example: indent size, curly braces on new line, etc).



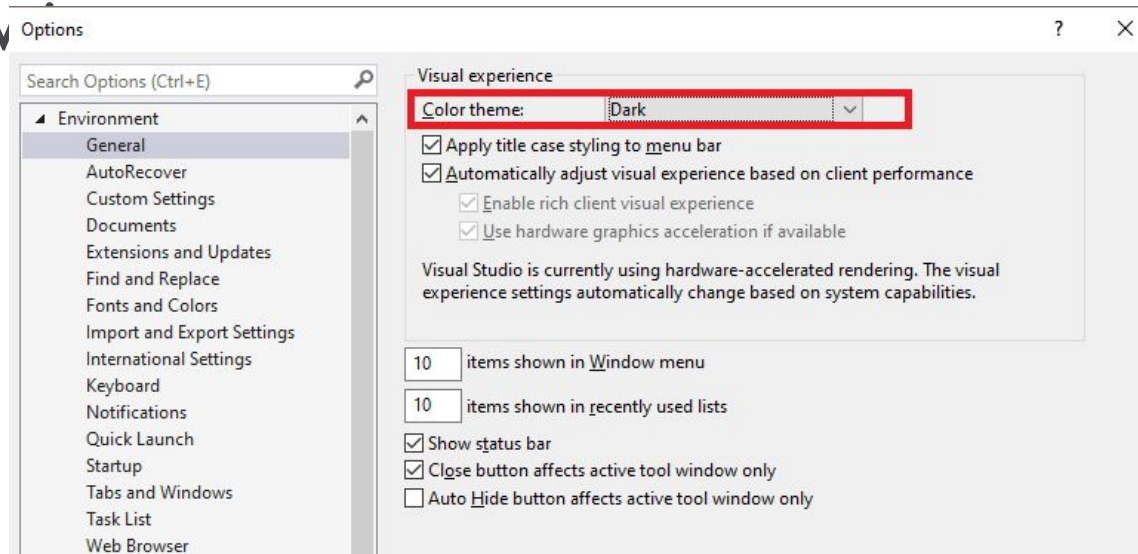
Installing CLANG-FORMAT

- On a file, click **Tools -> Clang Format Document** or do **Ctrl + R, Ctrl + D** to format the document



Night mode

- You might prefer a dark theme for programming.
- Go to **Tools -> Options...** and do the following



Using another text editor

- IDEs are usually not the best for development – you might prefer another code editor.
- I personally use Visual Studio Code to program, and switch to the IDE when it is time to load code/debug.
- As an embedded engineer, most of the time you will be writing code. Might as well make it comfy!

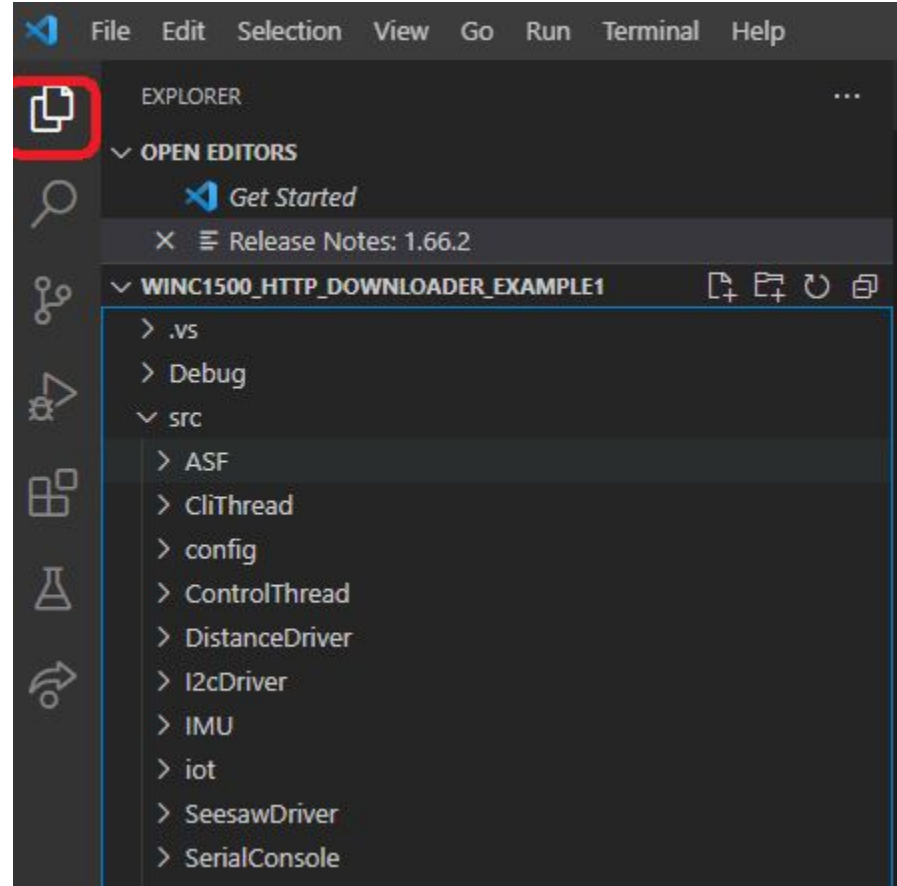
Visual Studio Code

- Download from <https://code.visualstudio.com/>



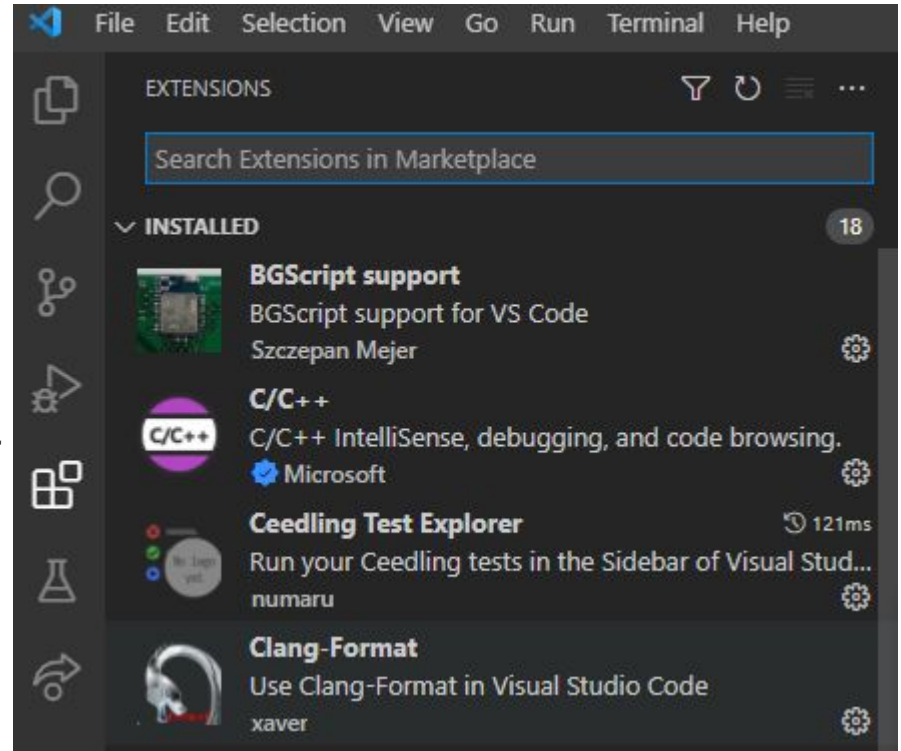
Visual Studio Code

- **Explorer View:** You can use the editor now as you would do in Microchip Studio (except with debugging and loading code!) but we need to add some plugins to make coding more enjoyable.



Visual Studio Code

- **Plugins:** Let's install plugins! You can click on the Plugin button and search for extensions. The following slide has a list of ones to install as a minimum.



Visual Studio Code

C/C++ Plugin

Clang-Format

Doxygen Documentation Generator

Git History and Git Lens – To make using GIT easy!

Visual Studio Code

- Once plugins are installed – Open visual studio code and do **File -> Open Folder...** and open the folder of the main project (The folder of the project you want to work on)
- This will open the starter project main application workspace, which is set up to autoformat when saving! Super cool and useful!

Visual Studio Code

- We also added a plugin to generate doxygen comments! See <https://github.com/cschlosser/doxdocgen#generate-doxygen-comments-in-vs-code>

Visual Studio Code

- We also added a plugin to generate doxygen comments! Try it out!
- 1.) Make a function, with any parameters
2.) On top of the function, start a doxygen block (type “/**” and press enter)
- The block will be done for you! See next slide

Visual Studio Code

```
| I  
bool fuzzy_equal(const matrix<T, M, N>& mat, T fuzz) const;
```