Lesson 1 - Creating a C18 Project with MPLAB

Objectives

- To build a C18 project
- Identify the location of C18 program files

Preparation:

Microchip's MPLAB IDE and MPLAB C18 compiler are required for this and all the lessons. It is assumed that these have already been installed as instructed in an earlier lesson.

Required Resources:

Computer with MPLAB and C18
PIC18F4520 datasheet

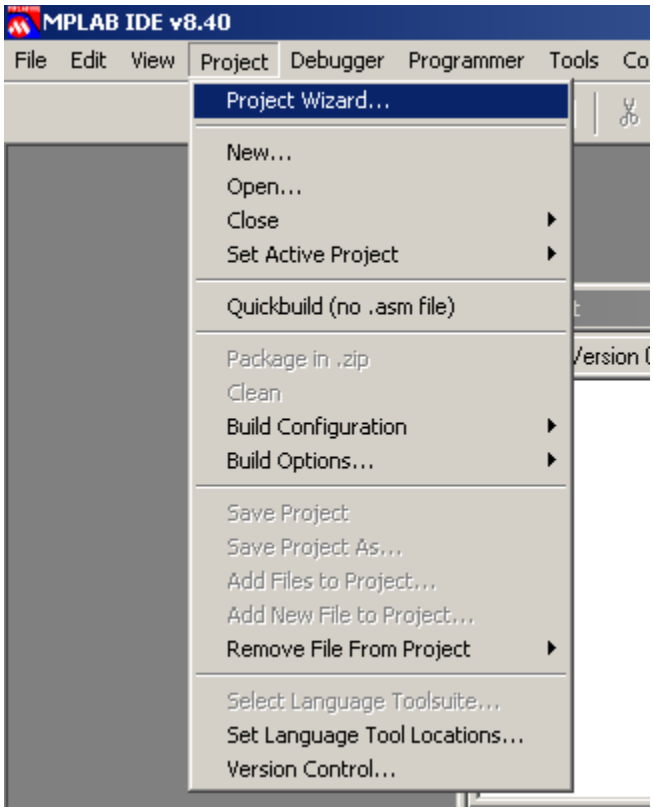
Procedure

In this lab a project will be created that is compiled under C18. The program is essentially an empty program shell, but it illustrates the procedure for creating a new C18 project and compiling it under MPLAB.

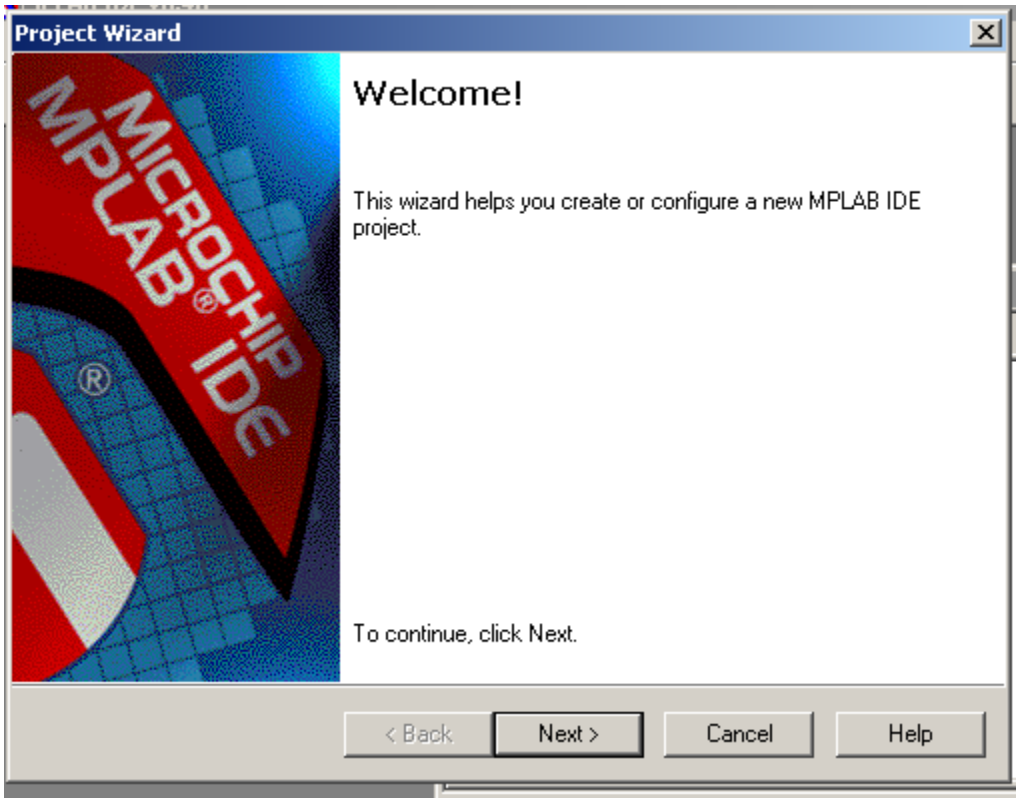
Note:
It is highly recommended that each project be saved under a separate directory. This will ensure that all project related files are accessible from the same folder.

1. Create a new folder on computer drive and name it **lesson1**
2. Open a MPLAB session

3. Click on the **Project** Menu and select **Project Wizard**

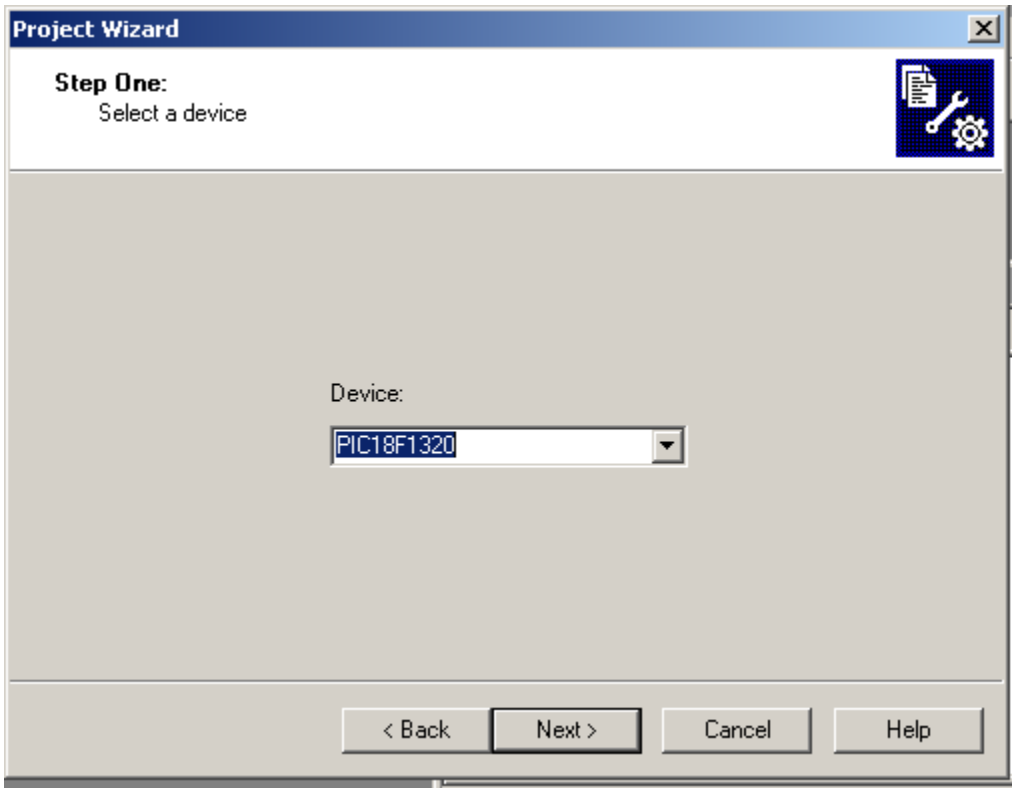


Project Wizard dialog box opens.



Device Selection

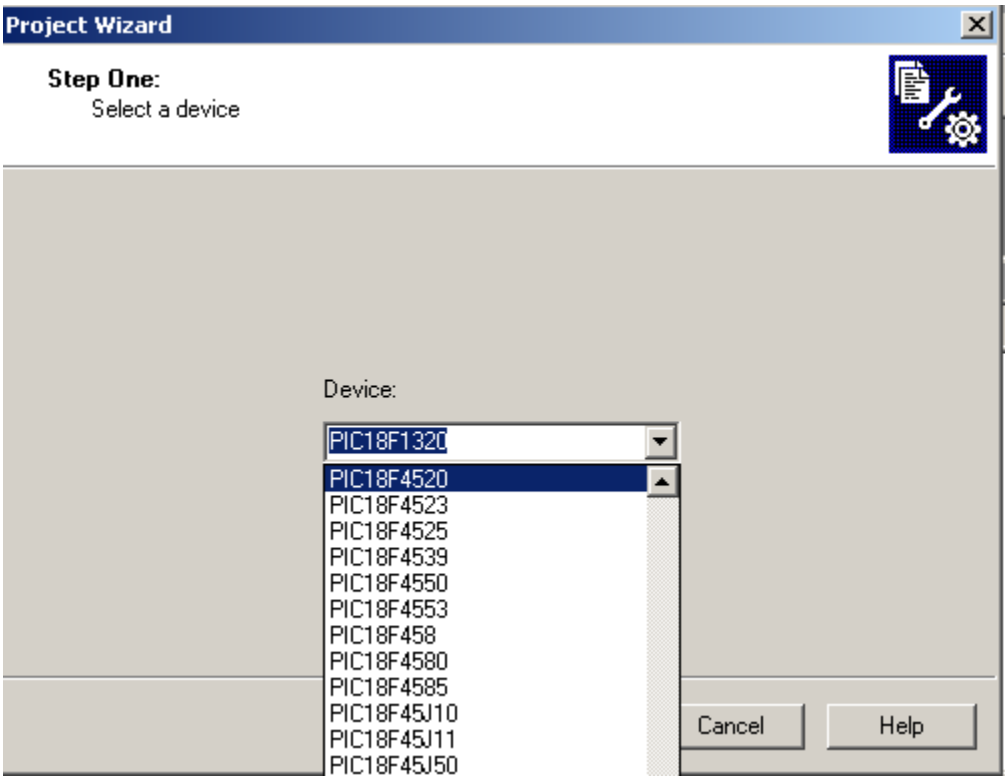
Click on the **Next** button and the dialog box for the first step appears.



In the **Device** drop down list box a processor is identified. If list box does not show the correct device, click on the down arrow to select the device of interest. It can be done in one of the two ways:

- Scrolling through the devices list
- Entering the correct name of the device in the list box.

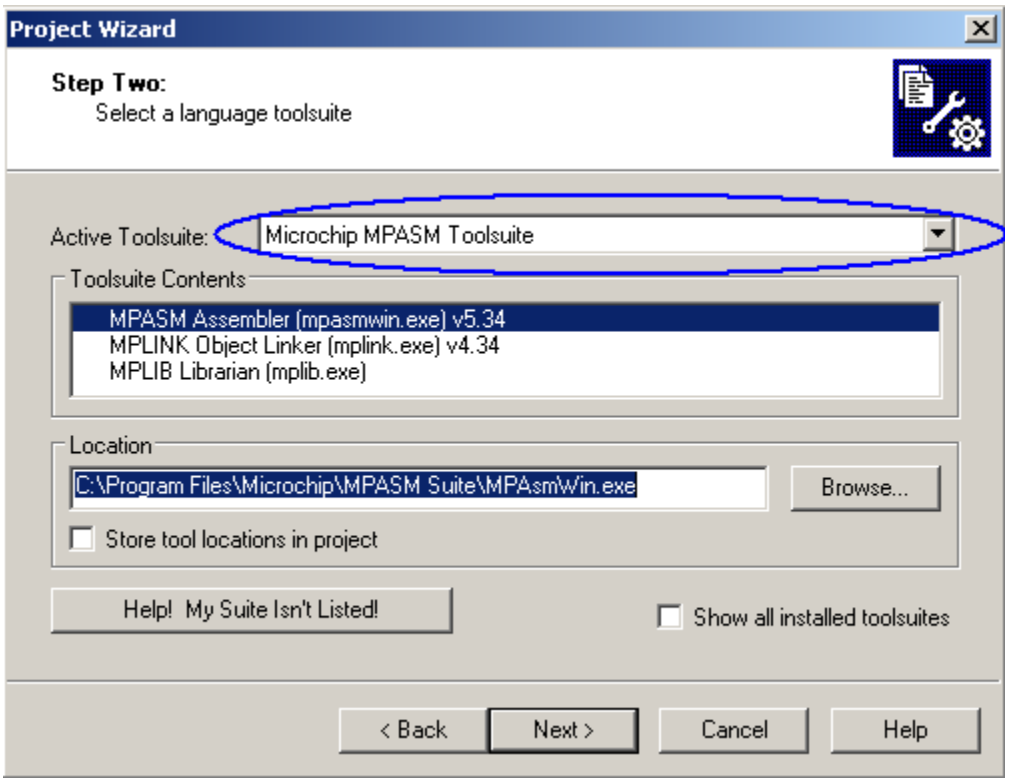
Here the device of interest is PIC18F4520, so it is selected from the drop down list box (scrolling up or down as needed).



Having selected the correct device, click the **Next** button to advance to the next step.

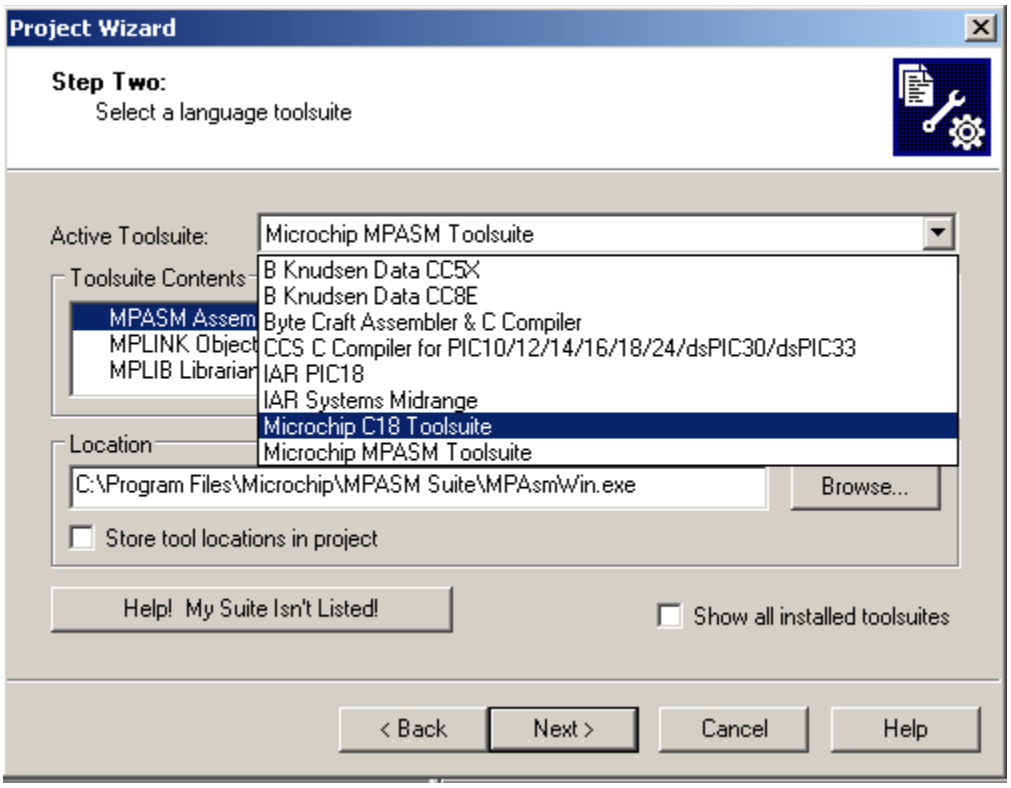
Language Tool Suite Selection

Step two of the dialog box opens, displaying the current language tool suite in effect.



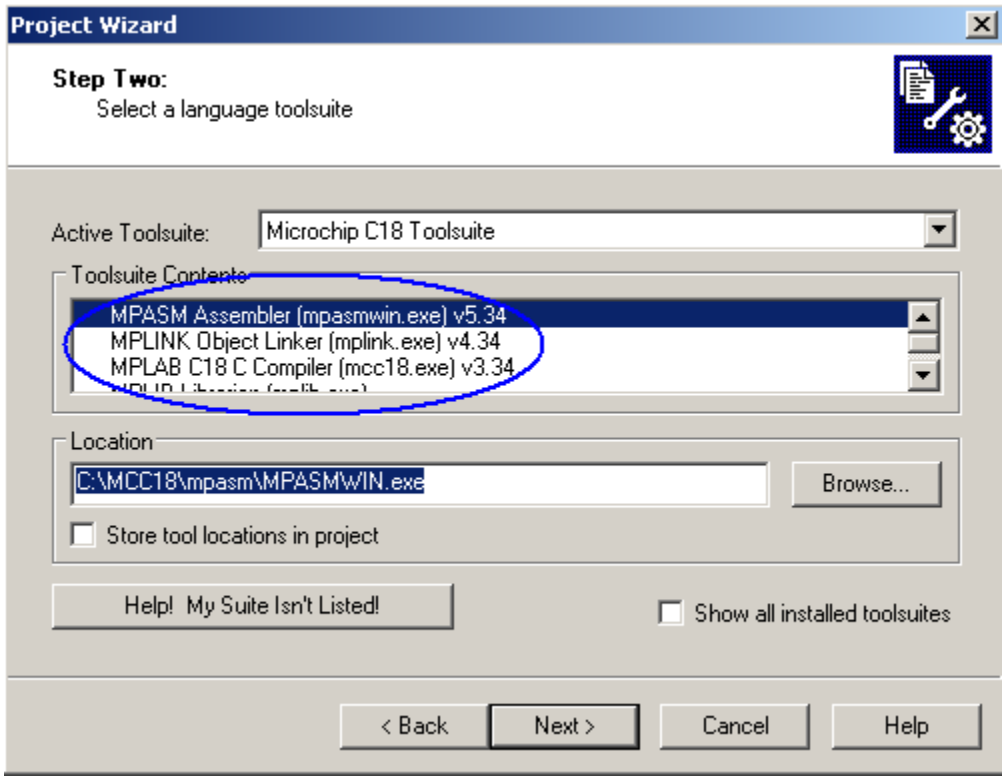
The current toolsuite (**ActiveToolsuite**) is **MPASM Toolsuite,** which is not the desired Toolsuite.

Again using dropdown list box select **C18 Toolsuite**



Toolsuite Contents

The active Toolsuite is changed to C18.



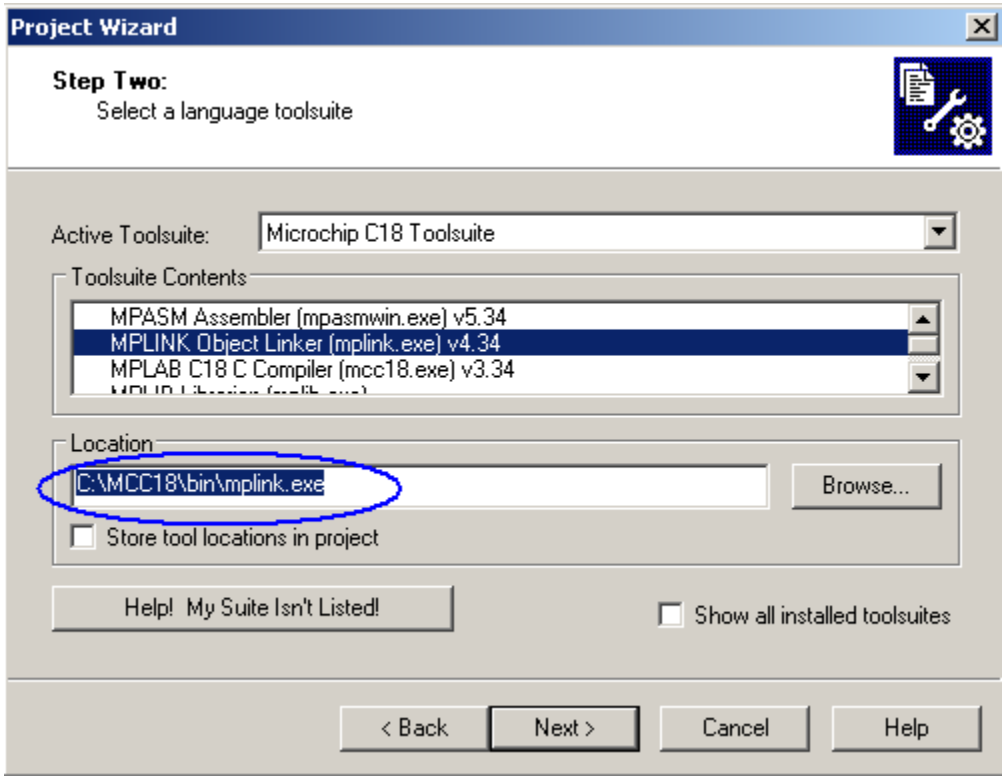
The Toolsuite has 4 components:

- Assembler
- Object Linker
- C Compiler
- Librarian

The files associated with these components are identified in the location box. As the assembler file has been highlighted in the Toolsuite Contents, its location is being identified in the **Location** box as:

C\MCC18\mpasm\MPASMWIN.exe.

If the Object Linker file is highlighted, its location is identified in the **Location** box.

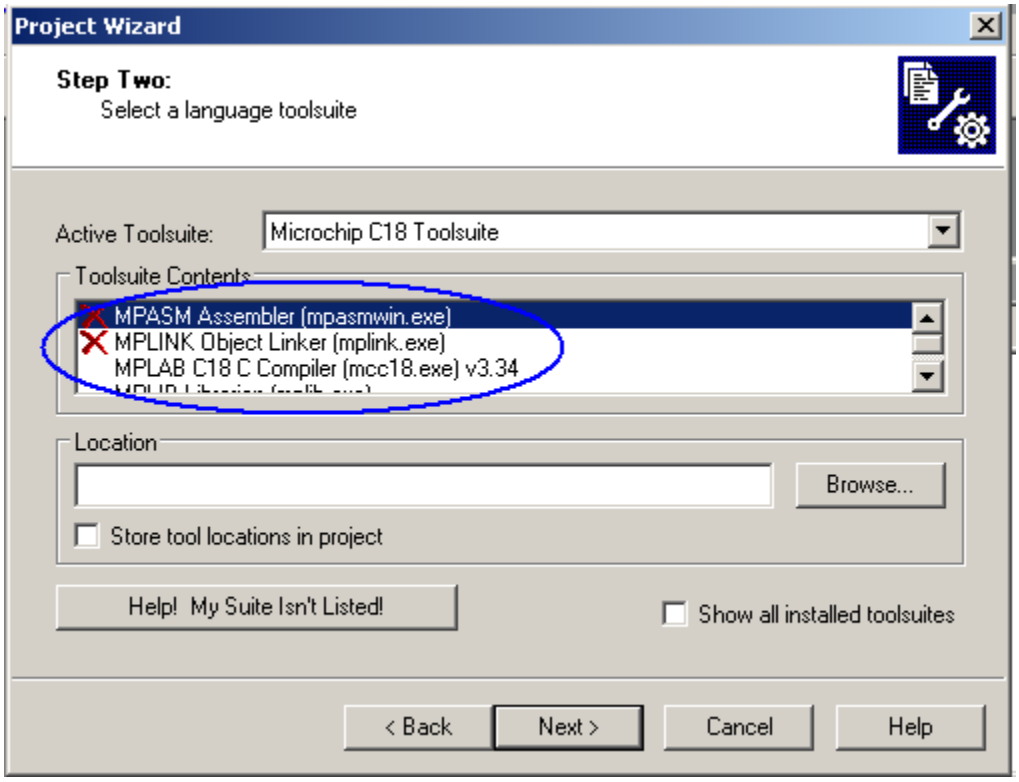


It is a good idea to become familiar with the location of each of these four files (components) of MPLAB C18 Toolsuite.

To Do: Highlight each component and view the file location.

Manually Locating Toolsuite Components

Sometimes, the location box may indicate a wrong location, or it may be empty. This could be the result of either the previous project using a different Toolsuite or because of the action of another user of the computer. In this case, the components can manually be located. The following screen shot shows a situation, where this action may be necessary.

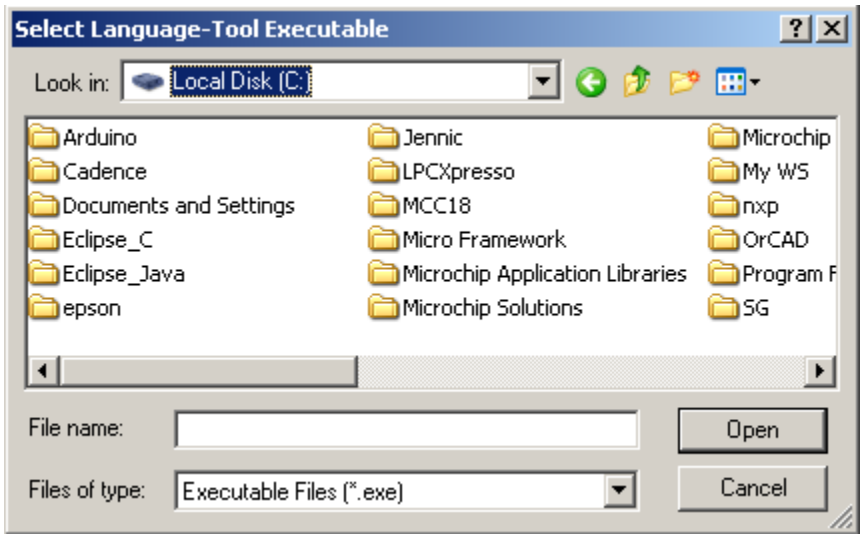


Here first two components have not been located and MPLAB has places an 'X' besides each one of the two.

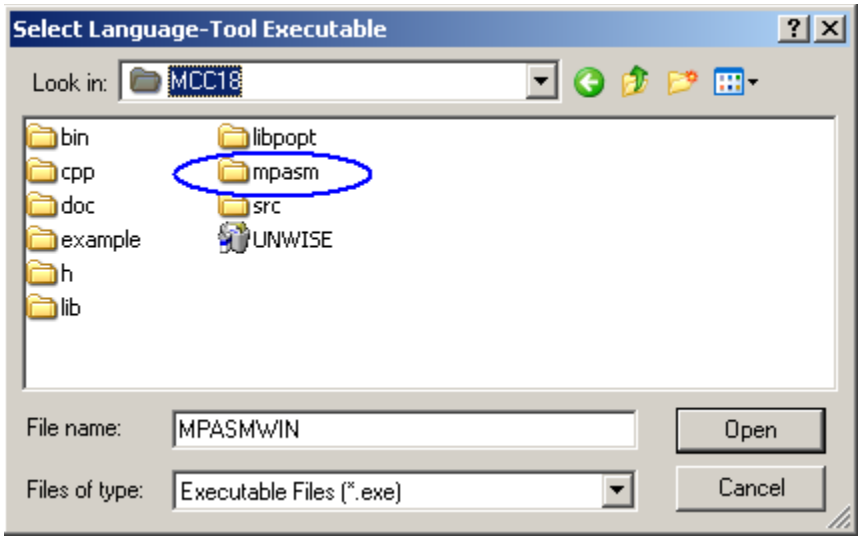
In this case the location, where these two components are located has to be identified correctly.

To locate the first highlighted components (MPASM) click the **Browse** button.

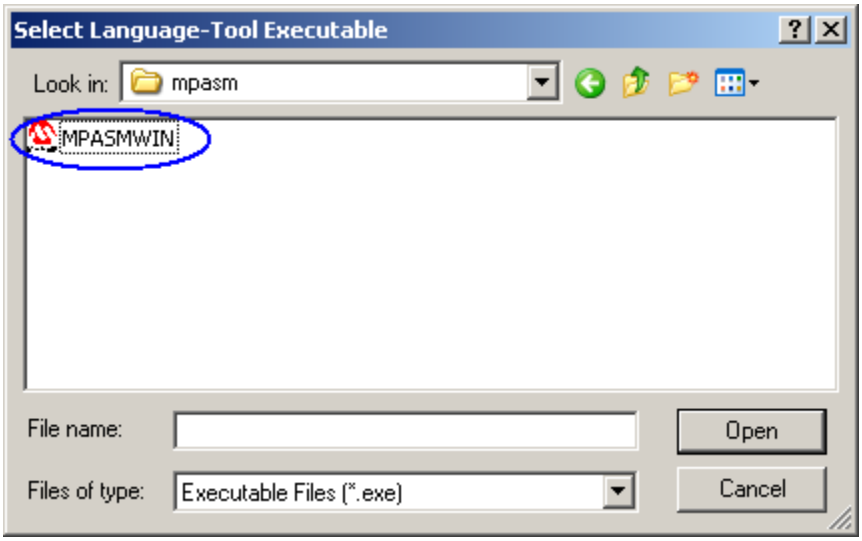
A dialog box opens.



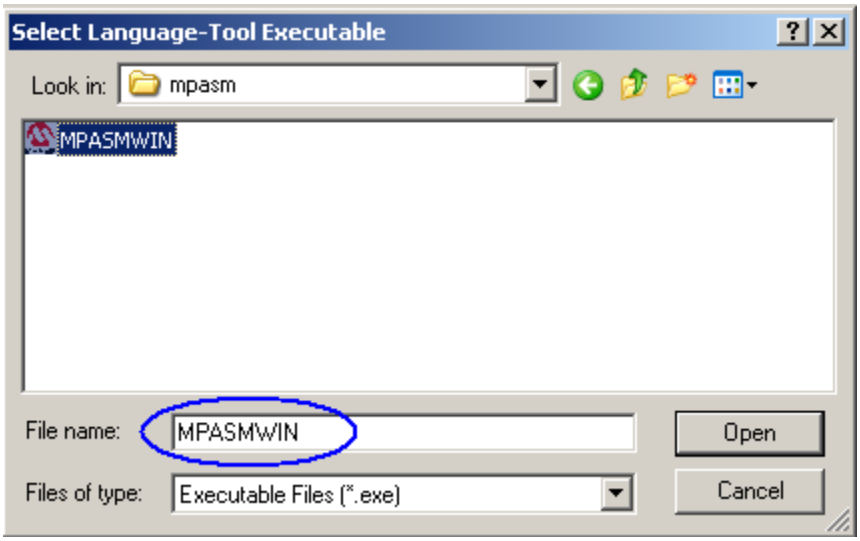
Browse to the folder where MCC18 has been installed. MPASMWIN is contained in mpasm sub-folder of MCC18.



Open mpasm folder:

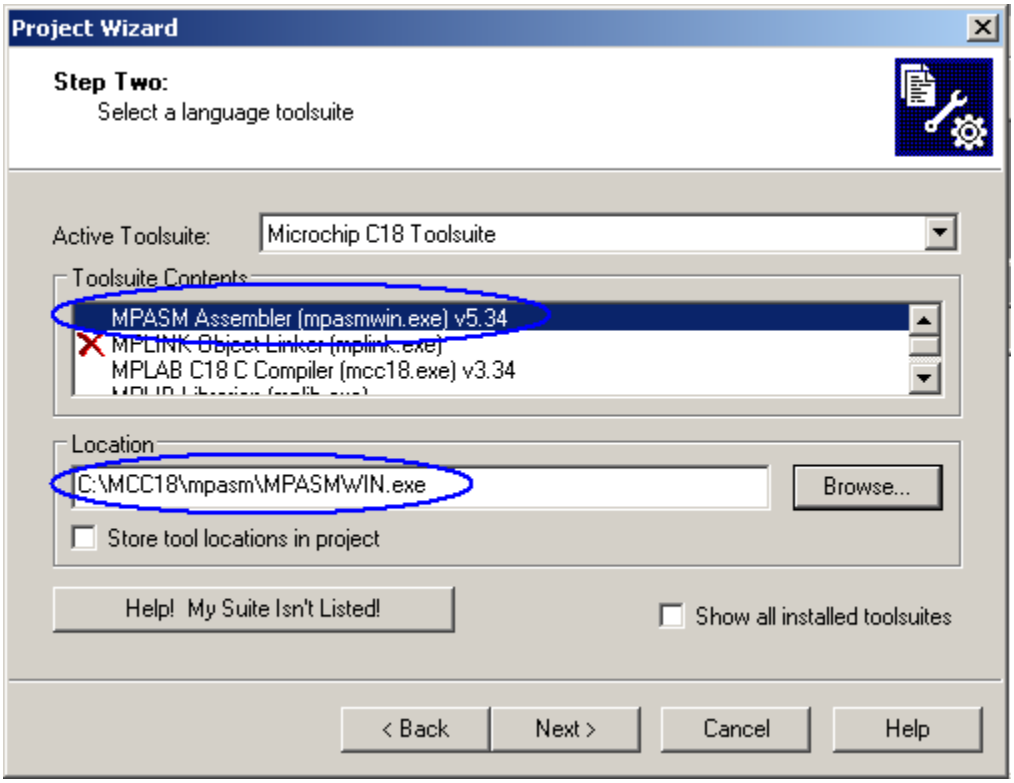


MPASMWIN file is located in this folder. Highlight it

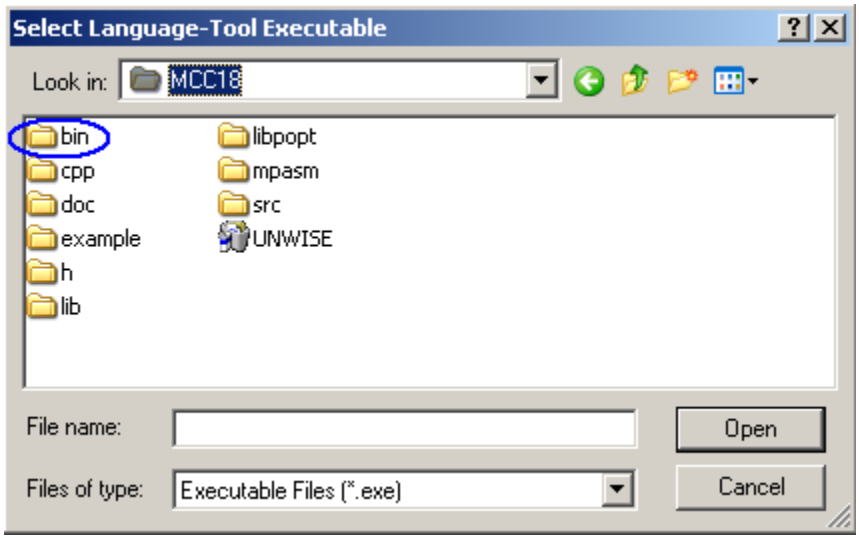


The file name is shown in the **File name:** box now click the **Open** button.

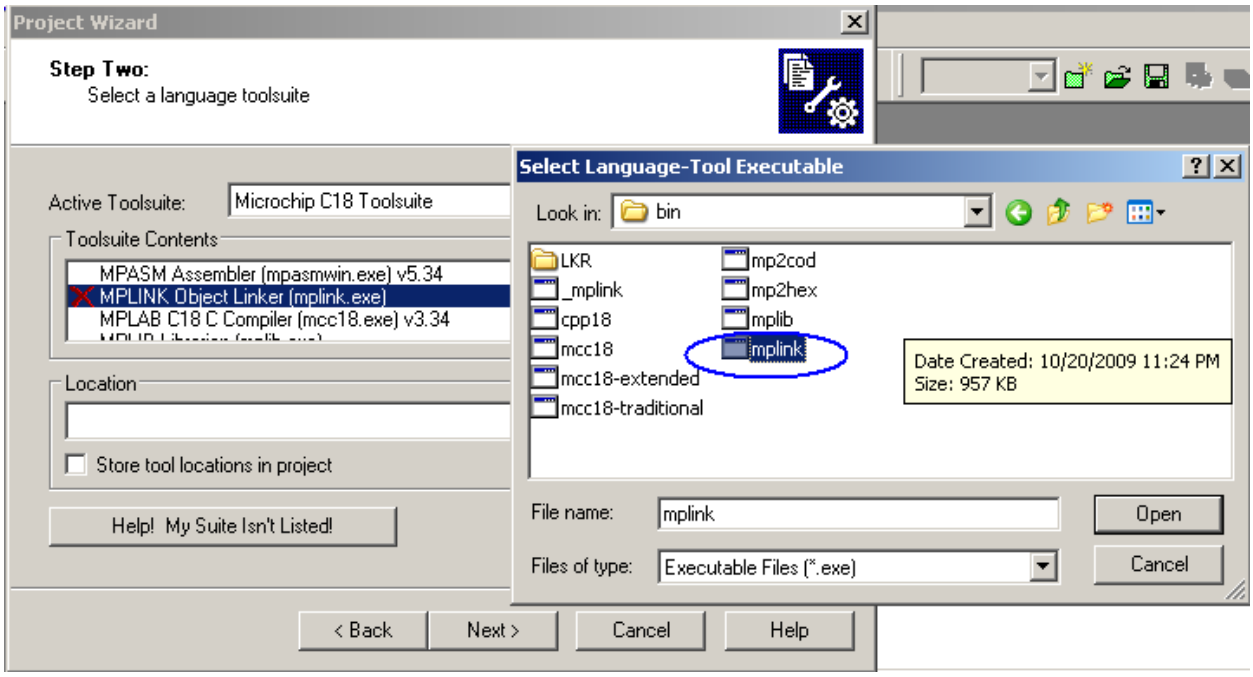
The Step two of Project Wizard dialog box appears again. This time the MPASMWIN has been identified on the computer and the 'X' mark has been removed from the Assembler component.



Similarly, using the Browse button, locate the next missing component. It is located in **bin** sub-folder of MCC18.



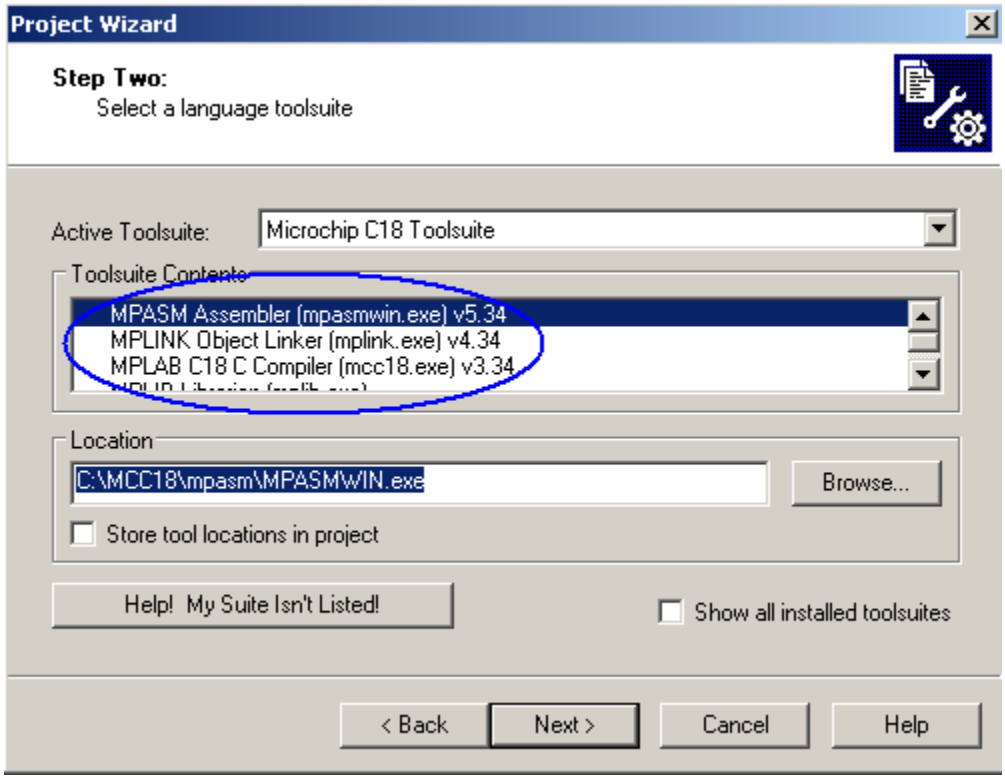
Open the bin sub-folder and identify the mplink.exe file. It is helpful to drag the Select Language dialog box to the side of the Project wizard dialog box to see the required file name (as shown below)



Notes:

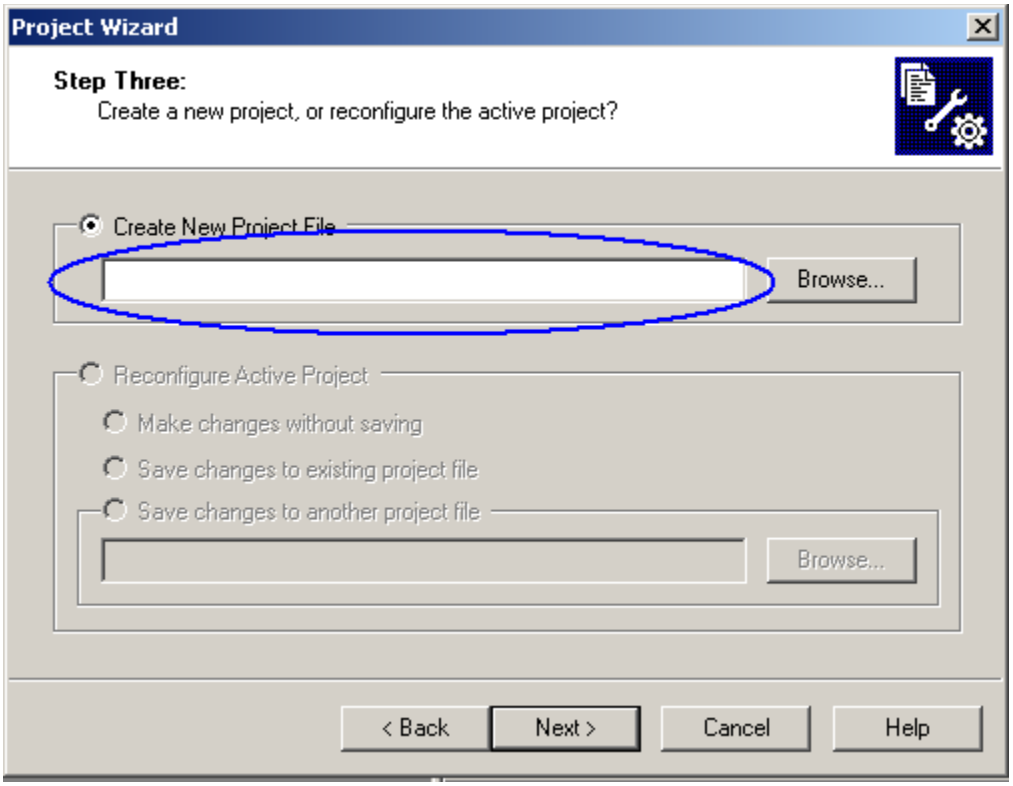
- It is important that the Toolsuite location be correctly specified for C18 Toolsuite
- The location of each of the 4 files needed by C18 Toolsuite needs to be individually verified
- All these files need to come from the same MCC18 folder.
- Multiple versions of these files with same name(s) are sometimes located in different folders. These are not interchangeable and only the files from MCC18 folder can be used.
- The location of MCC18 folder varies from computer to computer and depends upon the installation. The following two paths are commonly encountered:
  - **C:\MCC18**
  - **C:\Program Files\Microchip\MCC18**
- It is imperative that the above should be (quickly) checked, every time a new project is built.
- Once the Toolsuite location has been correctly identified, subsequent project builds should automatically identify the correct location of these components, unless the same computer, at times, is being used with different Toolsuite.

After all components have been correctly identified, the Step two dialog box will look like as follows(repeated):



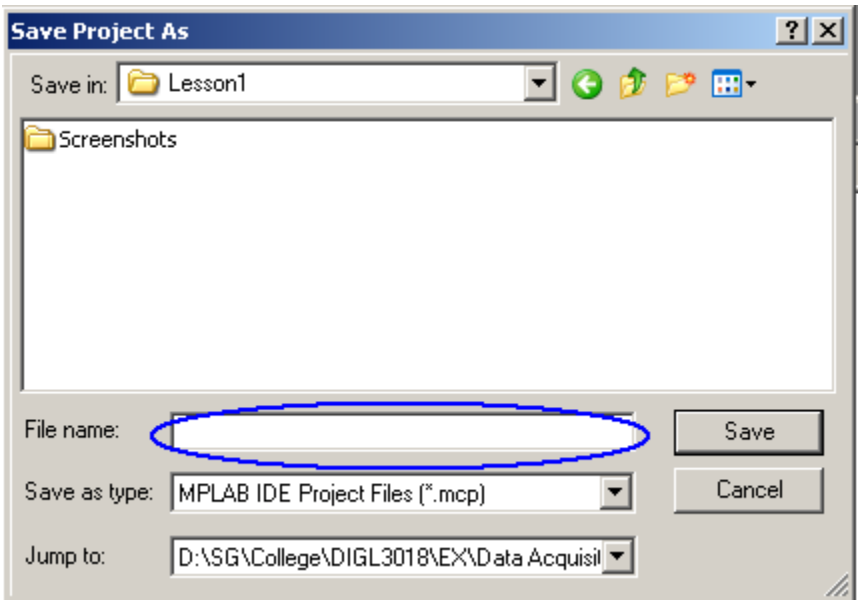
Click on the next button to go to Step Three of the dialog box.

The Step Three dialog box appears.



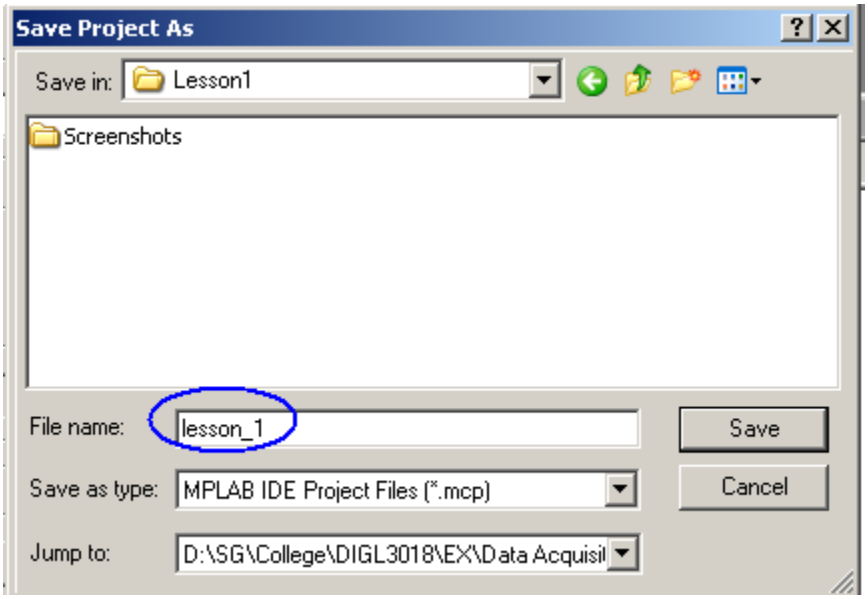
The project location shows an empty box. Clcik on the Browse button and point it to the folder Lesson 1 that was created at the start.

The folder opens

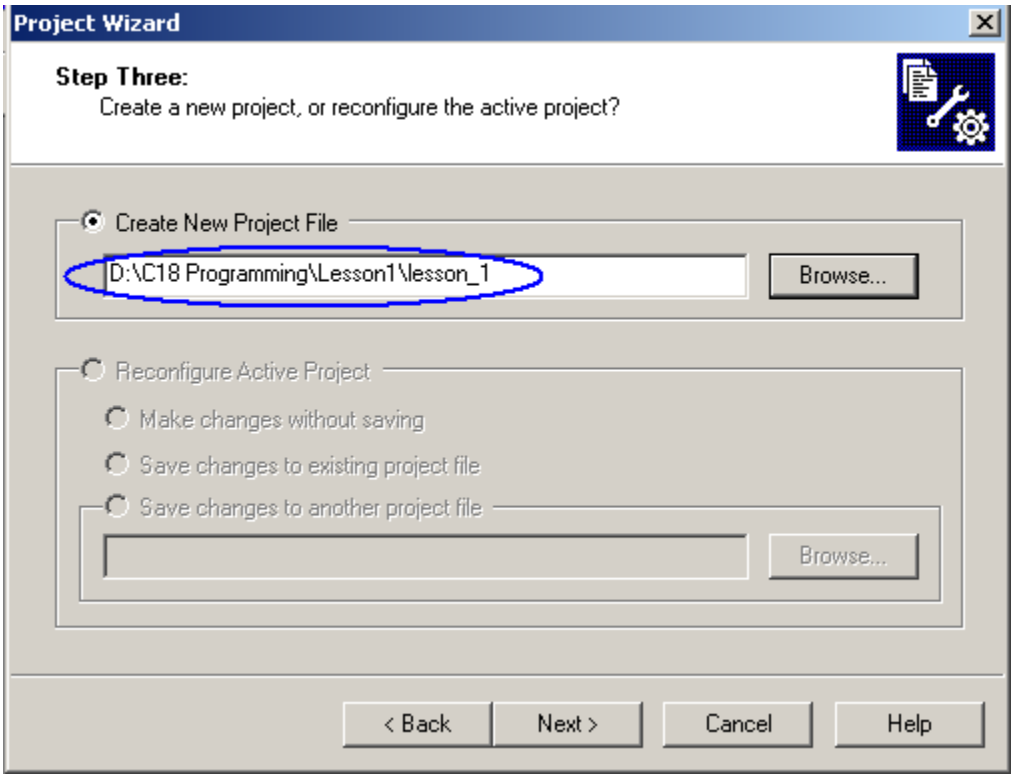


Enter the project name 'lesson_1' and click **Save** button.

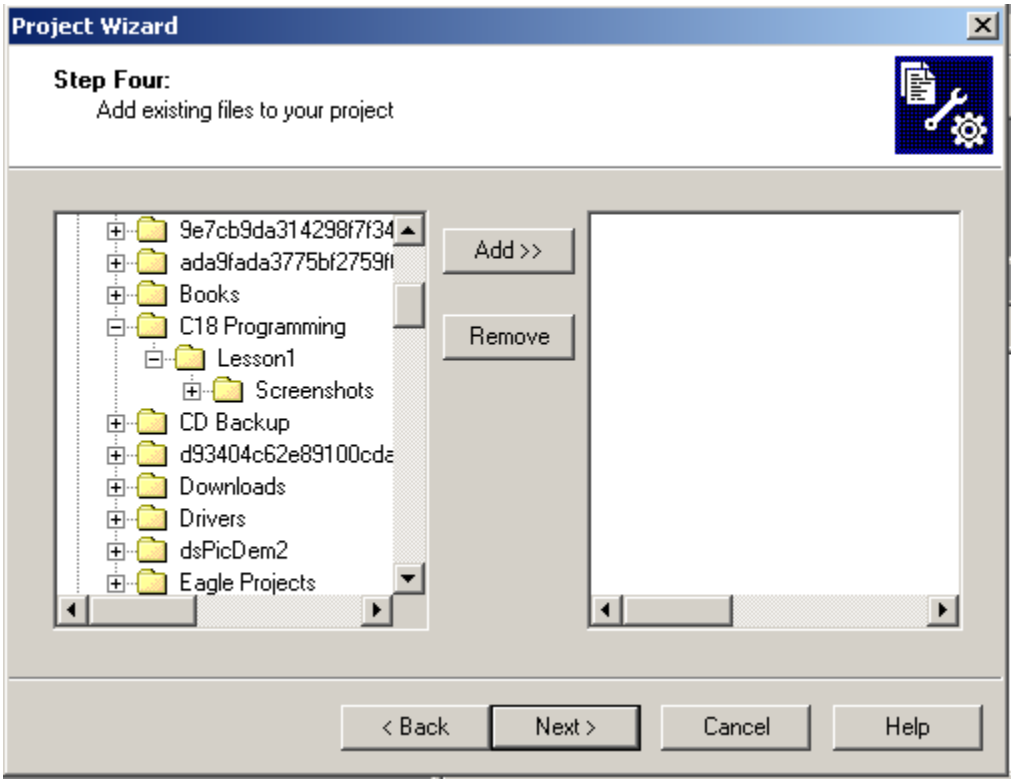
Do not add any extension. An extension of 'mcp' will automatically be added to the project name.



The Project Wizard dialog box returns, displaying the name of newly created project.

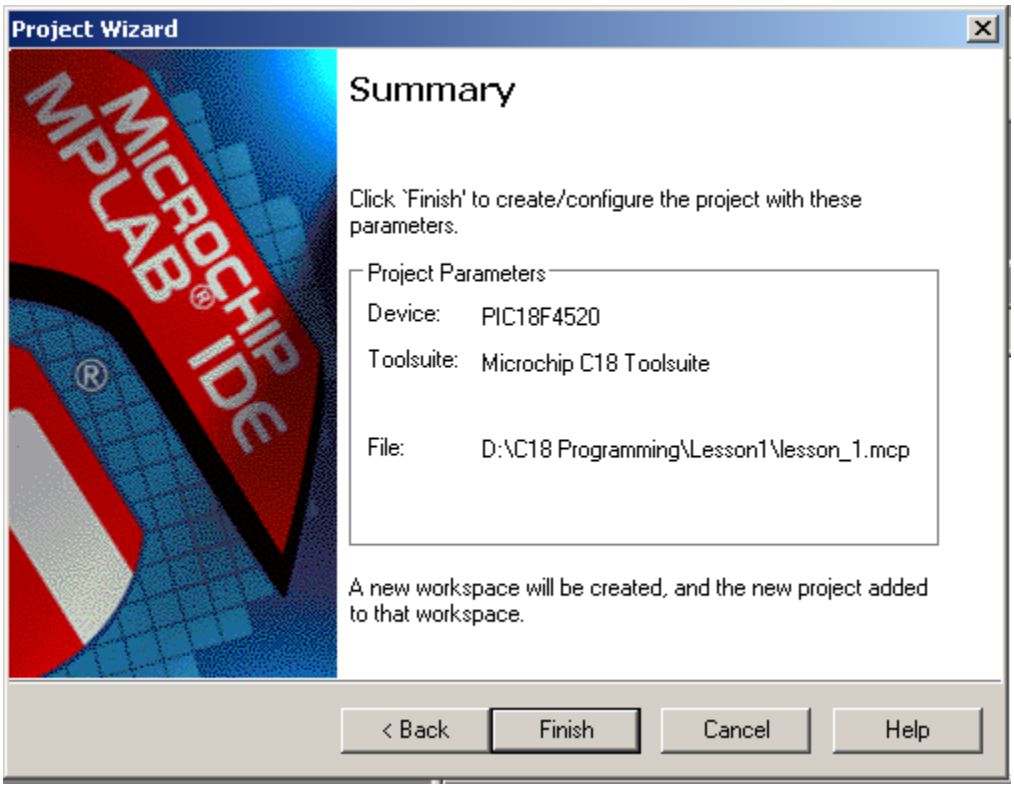


Step Four of Project Wizard is reached. This allows addition of any existing files to the project folder. Since, there are no existing files, simply click on the Next button to advance to the next step.



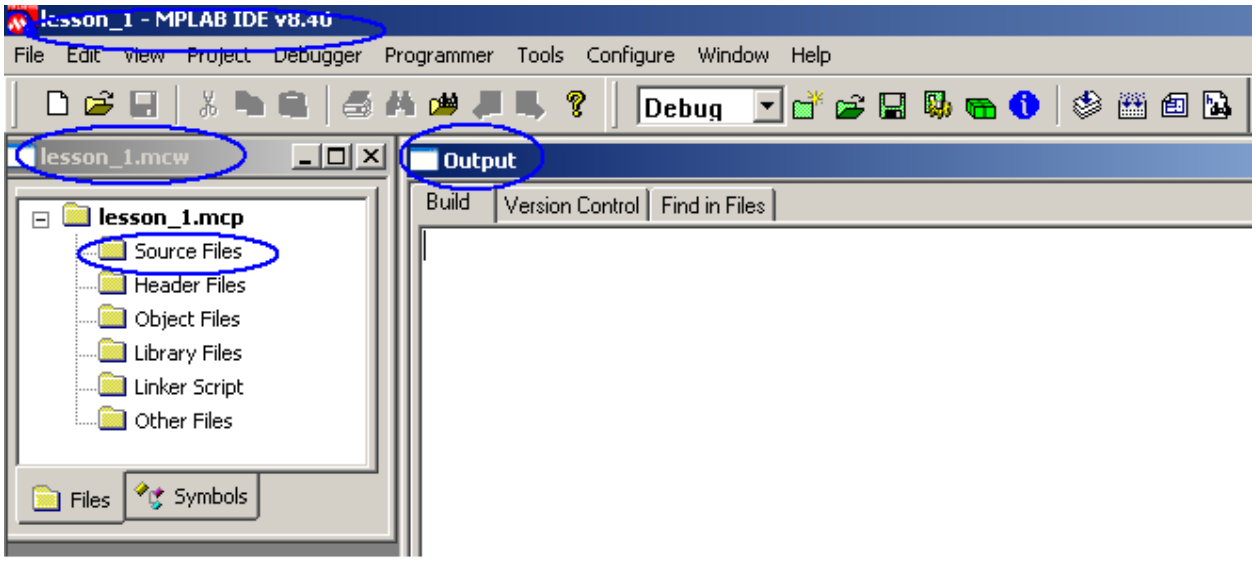
The project summary page appears, listing the following items:

- The device (PIC18F4520 in this case)
- The Toolsuite (Microchip C18)
- The project folder path and the project file name (lesson_1.mcp)



Verify that the summary page provides the correct information, else go back and make necessary corrections. Once satisfied, click the **Finish** button.

The MPLAB screen shows the project screen.



- The project name is shown in top status bar (lesson_1)
- A project panel appears showing the names of various folders that may be used with the project
- An output panel that will display the output of C18 compiler, during the build process.

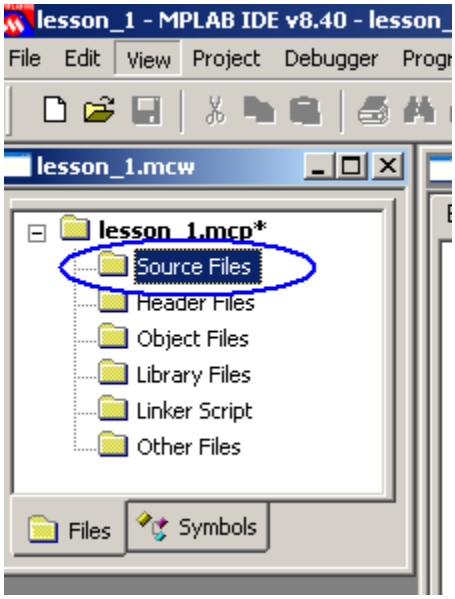
Source File

Every project has to have a minimum of one source file. Currently, the **Source Files** folder in project panel (accessible through View→Project, if closed) is empty, as it contains no source file.

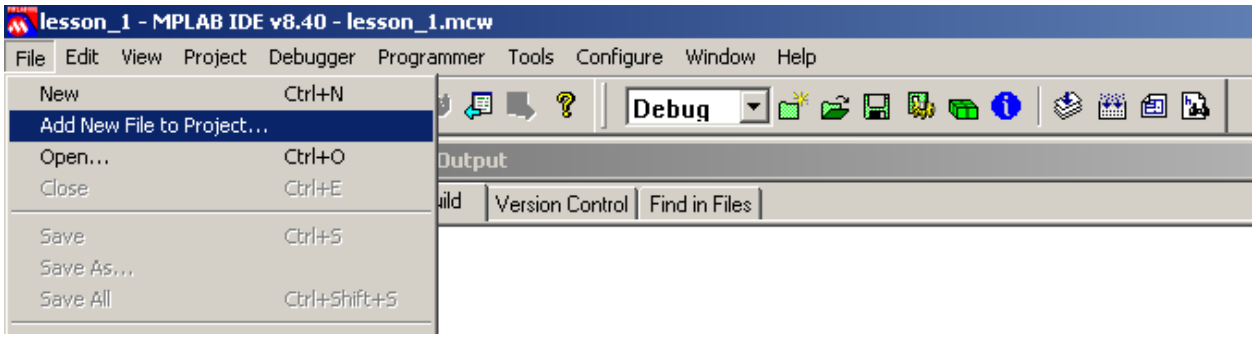
The next step is to add a source file.

Addition of a Source file

Highlight the **Source Files** folder in project panel.

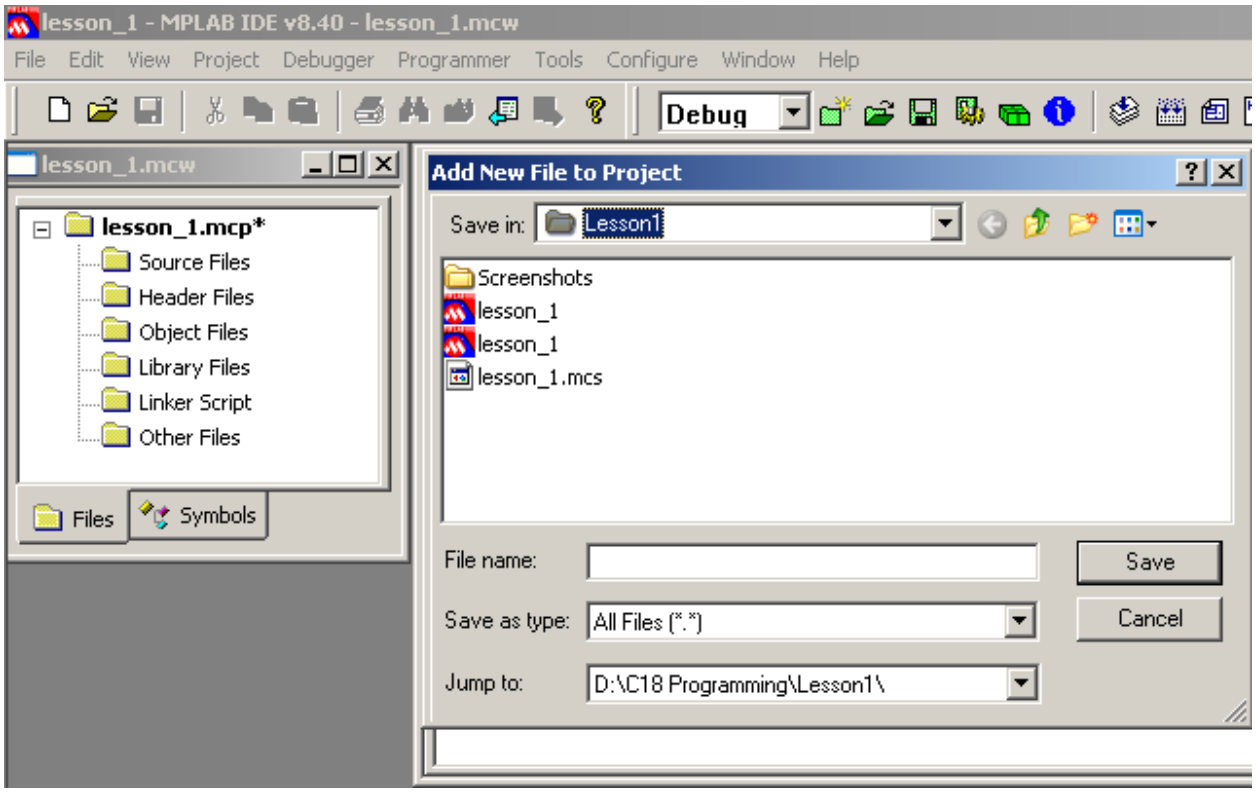


From **File** menu select **Add New File to Project.**



A dialog box opens.

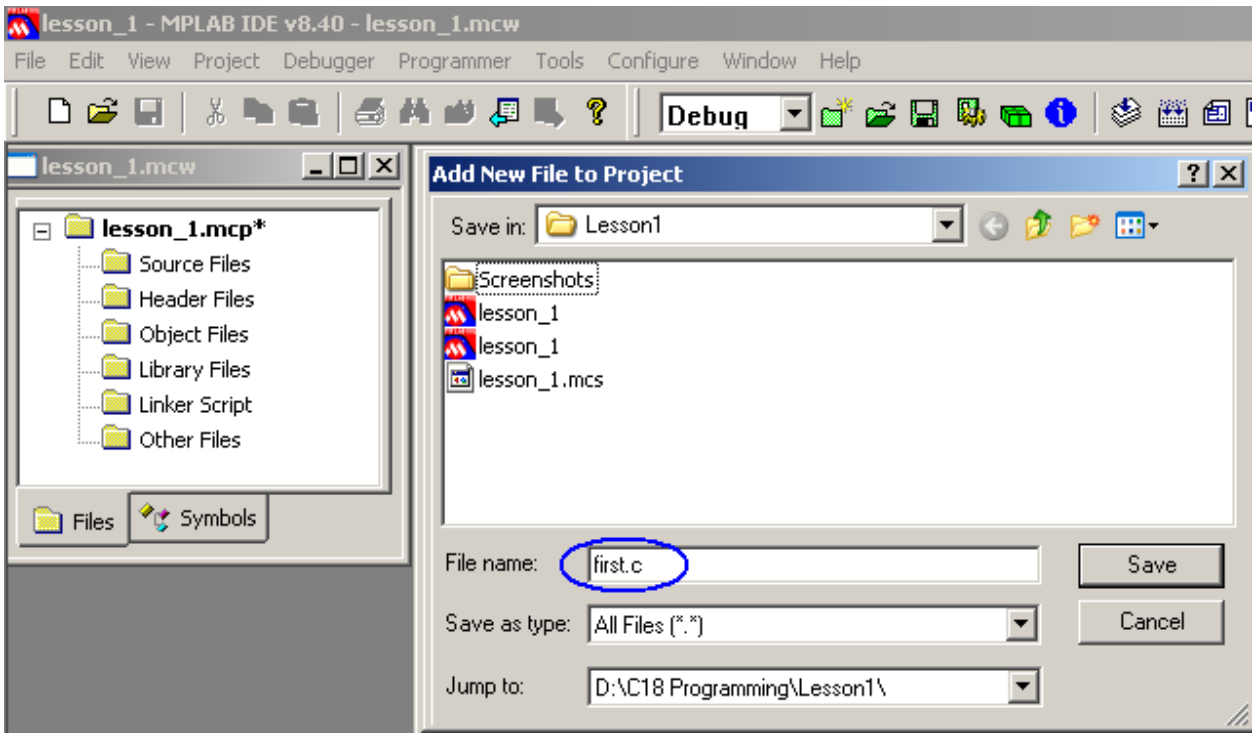
Browse it to the project folder (lesson_1).



It can be seen that it contains 3 files related to the project that MPLAB has automatically created.

In the **File name** box enter the name of the source file. It will be named as **first.c** (for a lack of a better name).

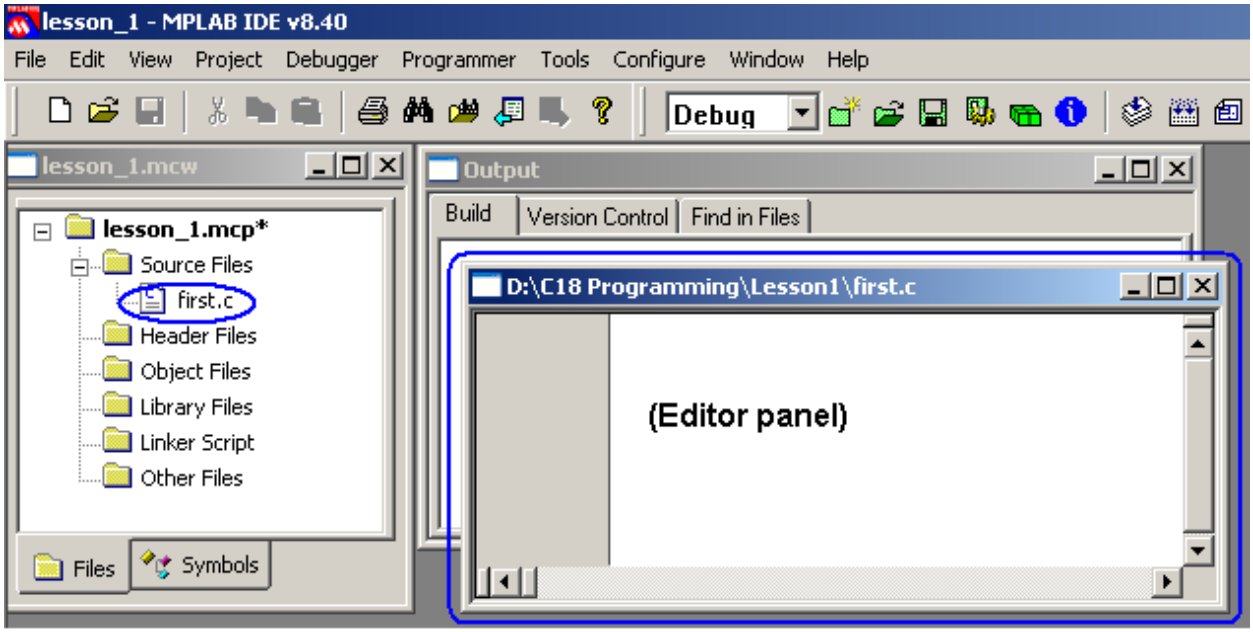
Note:
It is important that the '.c' extension be added. This practice will save headaches later on.



Click the **Save** button.

The source file is created and added to the project as indicated in the project panel.

An editor panel (Editor panel) also opens with name of the project and source file indicated in the status bar. This is used to enter the source code (C18 code) to the project



Adding (Source) Code to Source File

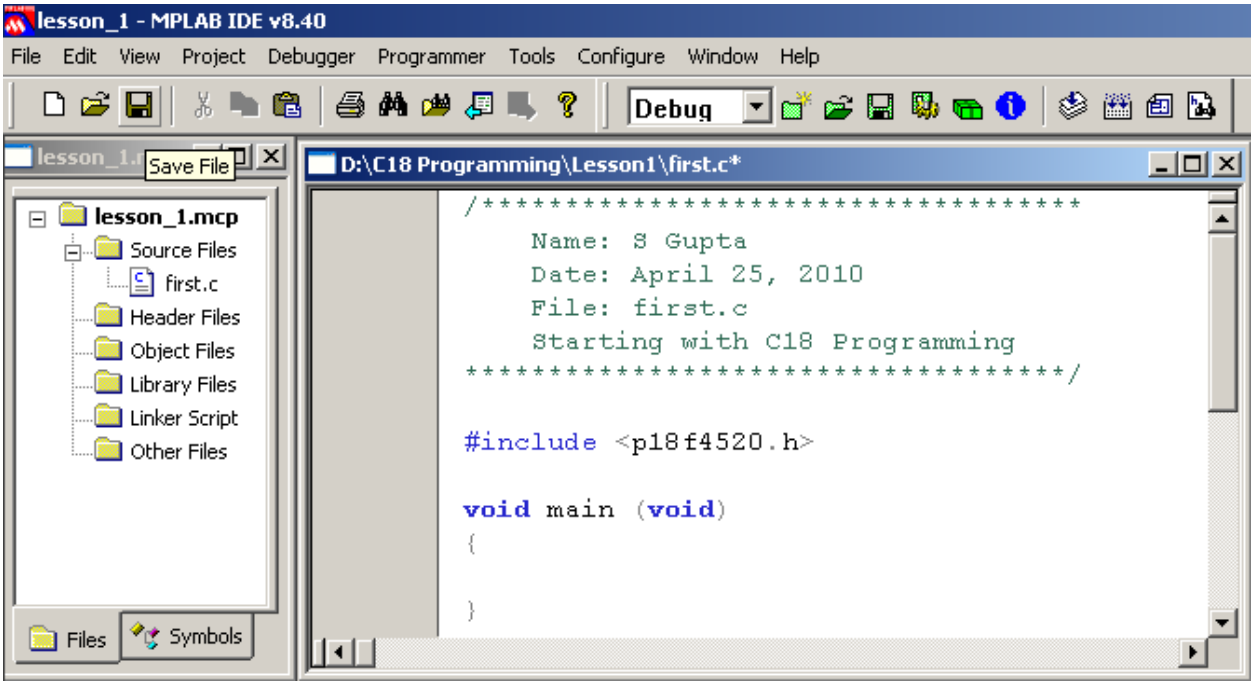
- Expand the editor panel.
- Type the following code in the editor panel. (Type as is shown)

```
/************************************
   Name: S Gupta
   Date: April 25, 2010
   first.c
   Starting with C18 Programming
************************************/
#include <p18f2420.h>

void main (void)
{

}
// ===================================================================
```

Once, finished with entering the code, click on the Floppy icon and save the file.

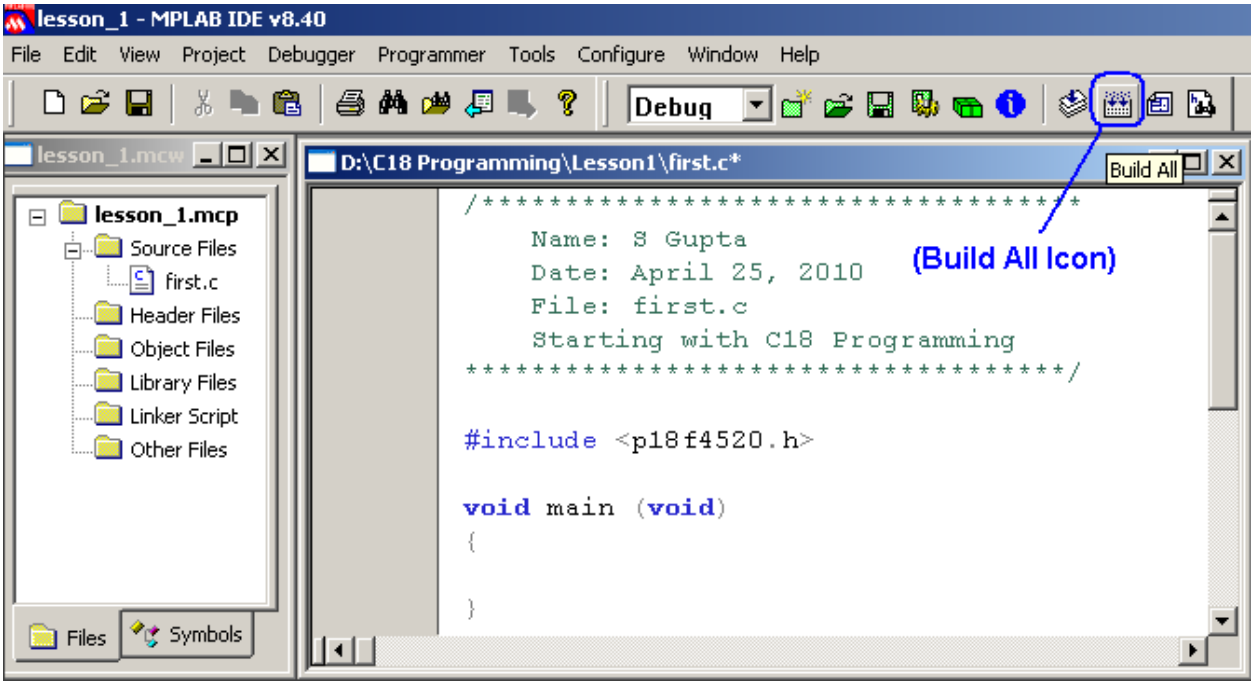


Building the Project

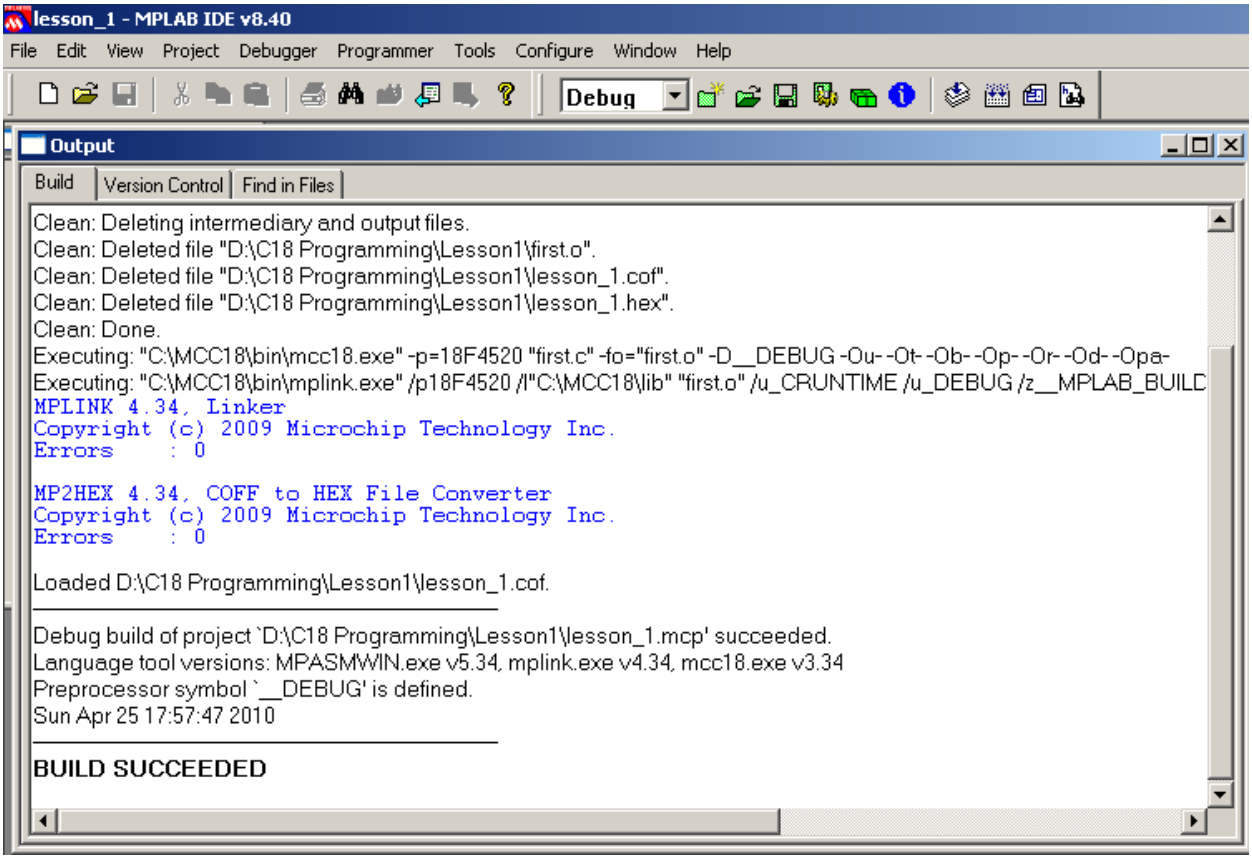
Although, it is an empty project, it can still be built.

Click on the **Build All** icon and build the project.

Observe the output Window, there should be no errors, otherwise check the source code and build again.



On a successful build the output panel indicates a success "**BUILD SUCCEEDED**"

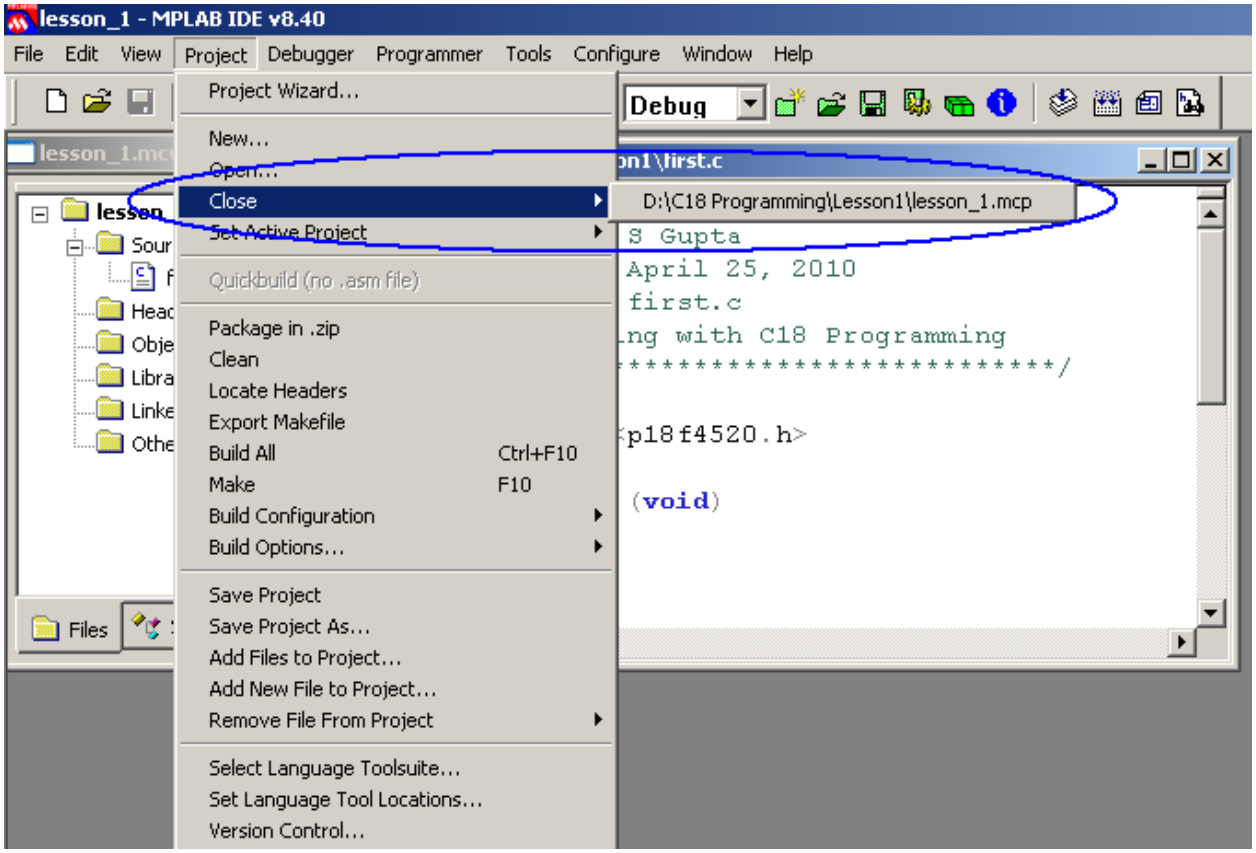


Congratulations! The project has been successfully built.

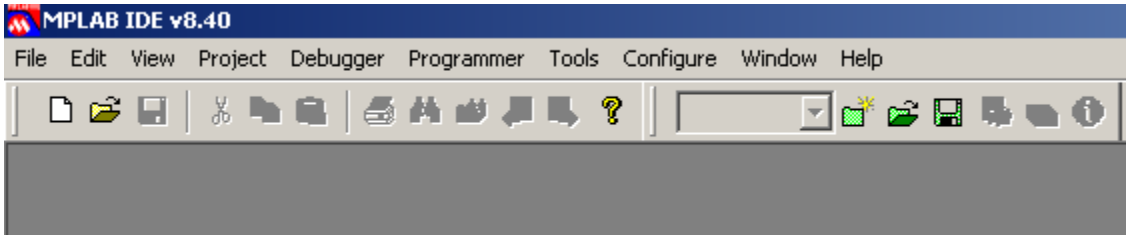
Closing the Project

The project should always be properly closed.

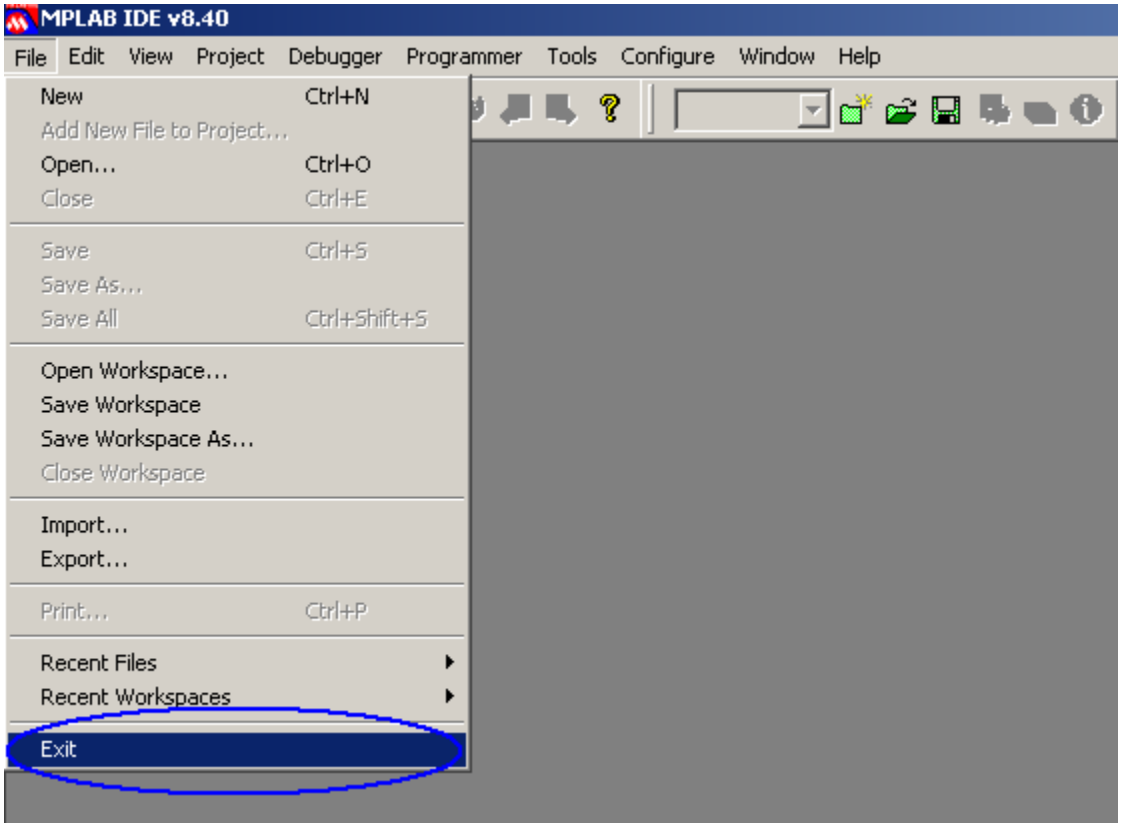
Click on **Project →Close** to properly close the project (saving all required MPLAB files)



MPLAB window with no projects opened is displayed.



Click on **File→ Exit** to close MPLAB session.



This terminates the MPLAB session.

This concludes Lab1. ***