Setting up the Visual Studio Community 2019 Compiler for MapleSim

www.maplesoft.com

MapleSim™

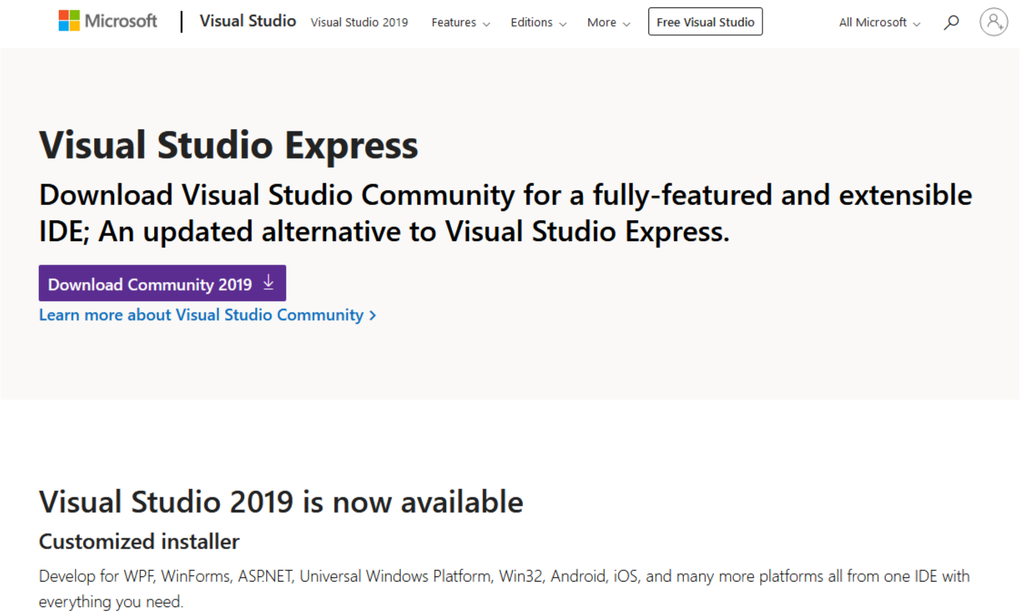
For MapleSim, the Visual Studio C++ Compiler is required to be installed if you work with MapleSim Insight, generate compiled FMUs or S-functions with the FMI Connector or MapleSim Connector (no compiler is required when just generating the source code) and to run JMAG models.

If you choose to not install the external compiler, MapleSim has a built-in LLVM compiler that will be used and you will have all of the expected functionality, except for in these special use cases mentioned above.

To install Microsoft Visual Studio Community 2019, please do the following:

- **Note:** This guide assumes that you have already installed Maple and MapleSim. If you are having difficulties with these installations please contact Maplesoft Technical Support (support@maplesoft.com) before continuing.
- **Note:** You need to log into a User account with administrative privileges to set up and install the Microsoft Visual C++ compiler.

1. In a web browser window, go to https://www.visualstudio.com/vs/visual-studio-express/:



Visual Studio Express

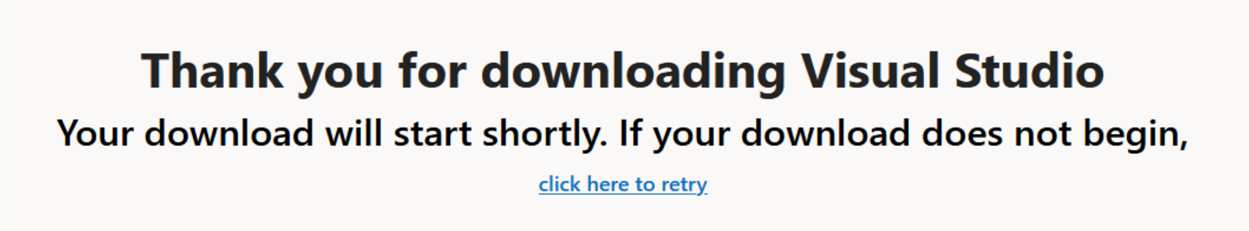
Download Visual Studio Community for a fully-featured and extensible IDE; An updated alternative to Visual Studio Express.

Visual Studio 2019 is now available

Customized installer

Develop for WPF, WinForms, ASP.NET, Universal Windows Platform, Win32, Android, iOS, and many more platforms all from one IDE with everything you need.

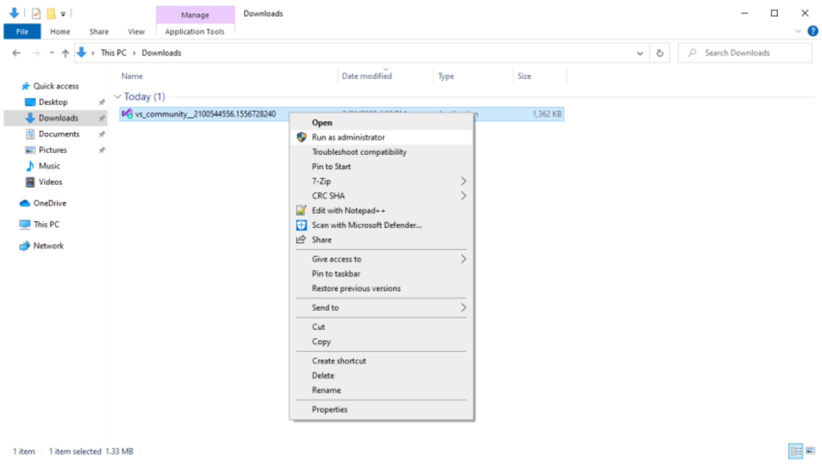
2. Click **Download Community 2019**.



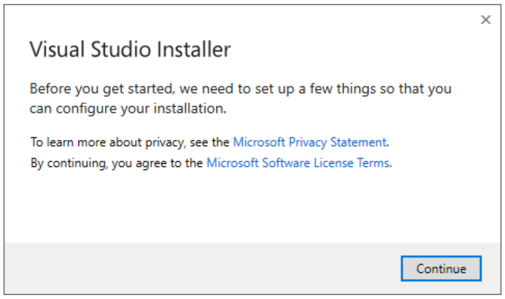
Thank you for downloading Visual Studio

Your download will start shortly. If your download does not begin,

3. Locate the installer file, likely in your **Downloads**. Right-click on the file and **Run as Administrator**:



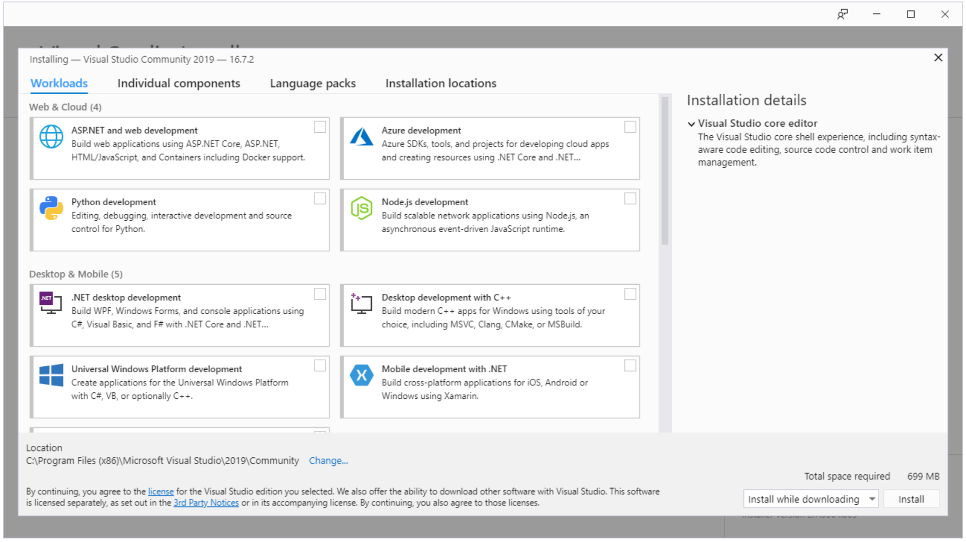
4. The **Visual Studio Installer** will launch:


Visual Studio Installer

Before you get started, we need to set up a few things so that you can configure your installation.

To learn more about privacy, see the Microsoft Privacy Statement.
By continuing, you agree to the Microsoft Software License Terms.

5. Click **Continue**:
6. MapleSim does not require the full installation of Visual Studio. The only **Workload** that you need to select is **Desktop development with C++**:


Installing — Visual Studio Community 2019 — 16.7.2

Web & Cloud (4)

□ ASP.NET and web development
Build web applications using ASP.NET Core, ASP.NET, HTML/JavaScript, and Containers including Docker support.

□ Azure development
Azure SDKs, tools, and projects for developing cloud apps and creating resources using .NET Core and .NET...

□ Python development
Editing, debugging, interactive development and source control for Python.

□ Node.js development
Build scalable network applications using Node.js, an asynchronous event-driven JavaScript runtime.

Desktop & Mobile (5)

□ .NET desktop development
Build WPF, Windows Forms, and console applications using C#, Visual Basic, and F# with .NET Core and .NET...

□ Desktop development with C++
Build modern C++ apps for Windows using tools of your choice, including MSVC, Clang, CMake, or MSBuild.

□ Universal Windows Platform development
Create applications for the Universal Windows Platform with C#, VB, or optionally C++.

□ Mobile development with .NET
Build cross-platform applications for iOS, Android or Windows using Xamarin.

Installation details

Visual Studio core editor
The Visual Studio core shell experience, including syntax-aware code editing, source code control and work item management.

Location
C:\Program Files (x86)\Microsoft Visual Studio\2019\Community Change...

Total space required 699 MB

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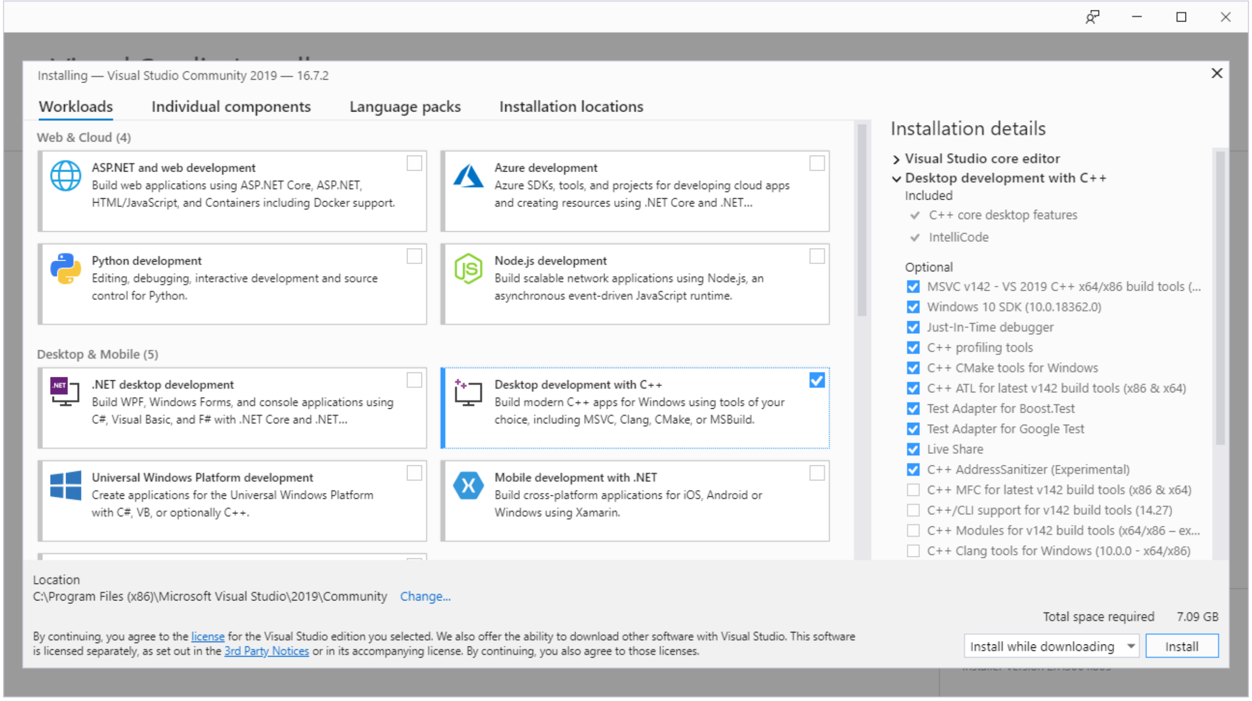
7. By default, here are the **Optional** components to install:



Installing — Visual Studio Community 2019 — 16.7.2

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Installation details

> Visual Studio core editor

∨ Desktop development with C++

Included

✓ C++ core desktop features

✓ IntelliCode

Optional

☑ MSVC v142 - VS 2019 C++ x64/x86 build tools (...

☑ Windows 10 SDK (10.0.18362.0)

☑ Just-In-Time debugger

☑ C++ profiling tools

☑ C++ CMake tools for Windows

☑ C++ ATL for latest v142 build tools (x86 & x64)

☑ Test Adapter for Boost.Test

☑ Test Adapter for Google Test

☑ Live Share

☑ C++ AddressSanitizer (Experimental)

☐ C++ MFC for latest v142 build tools (x86 & x64)

☐ C++/CLI support for v142 build tools (14.27)

☐ C++ Modules for v142 build tools (x64/x86 – ex...

☐ C++ Clang tools for Windows (10.0.0 - x64/x86)

Location
C:\Program Files (x86)\Microsoft Visual Studio\2019\Community

Total space required 7.09 GB

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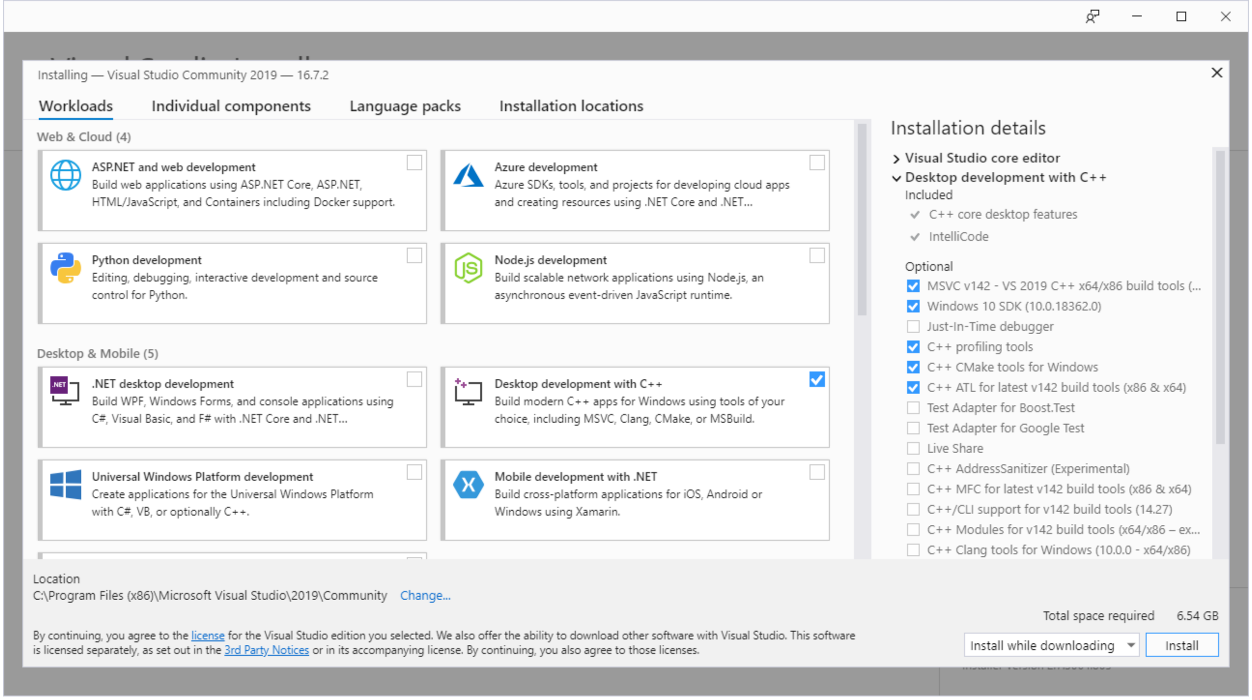
8. You can remove options so that you are left installing only **MSVC v142 – VS 2019 C++ x64/86 build tools, Windows 10 SDK, C++ profiling tools, C++ CMake tools for Windows, and C++ ATL for latest v142 build tools (x86 & x64)** :



Installing — Visual Studio Community 2019 — 16.7.2

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☐ C++ Modules for v142 build tools (x64/x86 – ex...

☐ C++ Clang tools for Windows (10.0.0 - x64/x86)

Location
C:\Program Files (x86)\Microsoft Visual Studio\2019\Community

Total space required 6.54 GB

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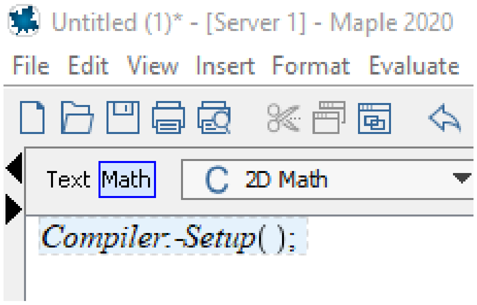
9. Click **Install**.

10. Once the installation is complete, you will need to **restart your system** to finish the setup.

11. Point Maple to the new compiler's location to complete the installation. To do so, **Open Maple** by right-clicking the shortcut and choosing **Run as Administrator.**

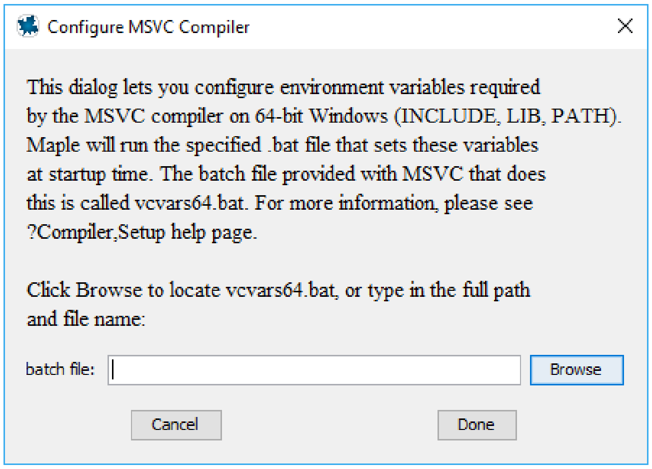
12. Once Maple has started, click the **New Document** button on the Maple Start screen.

13. At the Maple prompt, type **`Compiler:-Setup();`** and press **Enter:**


Untitled (1)* - [Server 1] - Maple 2020
File Edit View Insert Format Evaluate
Text Math
2D Math

Compiler:-Setup( );

14. In the dialogue box, click **Browse** to locate the **vcvarsx86_amd64.bat** file.



This dialog lets you configure environment variables required by the MSVC compiler on 64-bit Windows (INCLUDE, LIB, PATH). Maple will run the specified .bat file that sets these variables at startup time. The batch file provided with MSVC that does this is called vcvars64.bat. For more information, please see ?Compiler,Setup help page.

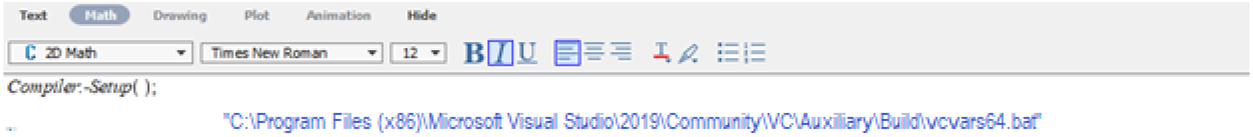
Click Browse to locate vcvars64.bat, or type in the full path and file name:

batch file:

15. If you did not change the installation location, you will find the file along the following path:

This PC > Local Disk (C:) > Program Files (x86) > Microsoft Visual Studio > 2019 > Community > VC > Auxiliary > Build > vcvars64.bat

16. Click **Done** to complete the configuration. Maple will output the file path to reflect a successfully configured path:



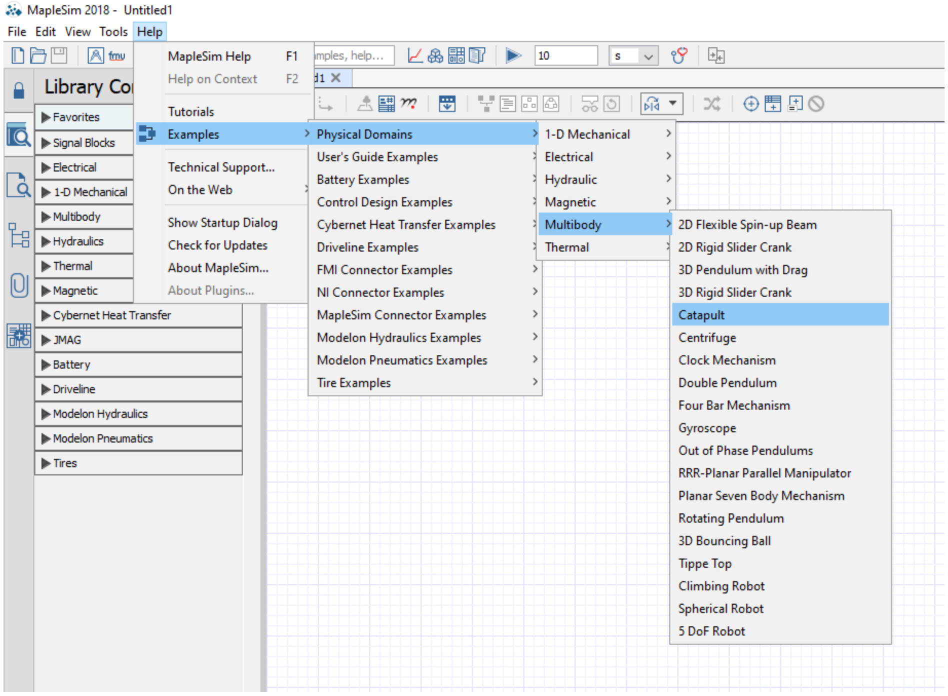
Compiler:-Setup( );

```
"C:\Program Files (x86)\Microsoft Visual Studio\2019\Community\VC\Auxiliary\Build\vcvars64.bat"
```

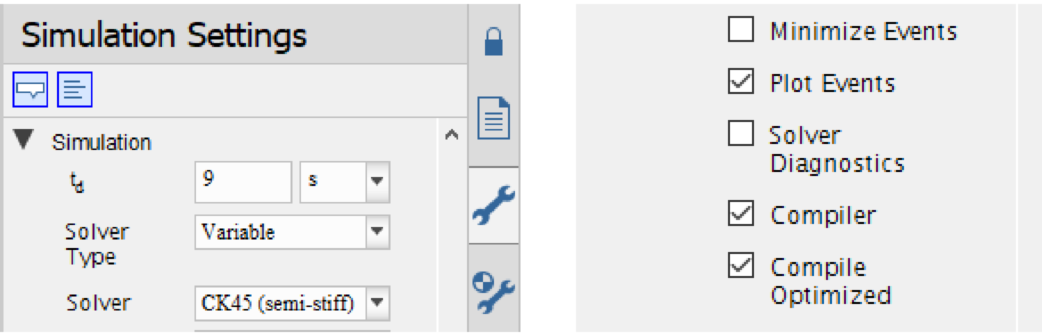
If it does not echo back the file path, please run the command again and double check that you have selected the correct file. An error will also occur if you did not open Maple with administrative privileges.

Now that the installation and setup is complete, you can confirm if the install was a success by running a sample simulation in MapleSim and verifying that the external compiler is being used.

1. Open MapleSim and choose an example model like **Help** > **Examples** > **Physical Domains** > **Multibody** > **Catapult**



2. In **Simulation Settings**, ensure that the option for **Compiler** is **checked** so that the external compiler will be used in simulation:


Simulation Settings

Simulation

t_d 9 s

Solver Type Variable

Solver CK45 (semi-stiff)

□ Minimize Events

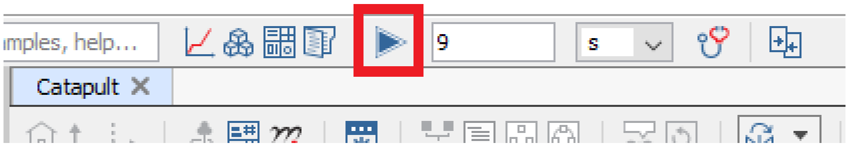
☑ Plot Events

□ Solver Diagnostics

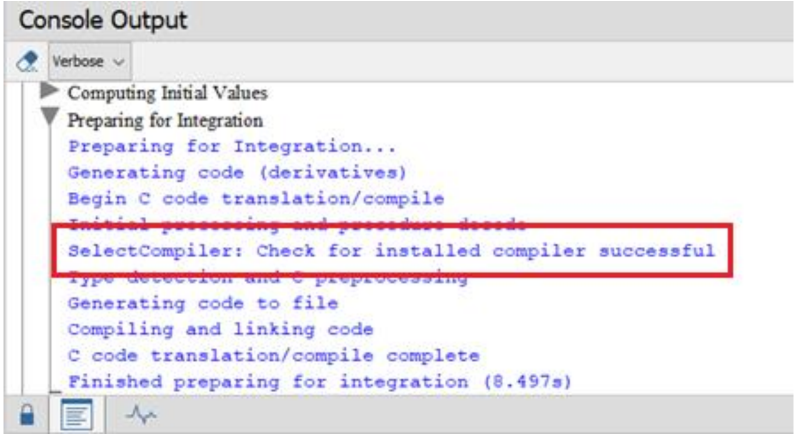
☑ Compiler

☑ Compile Optimized

3. Click the **Run Simulation** button to perform the test.



4. In the **Console Output** (bottom palette), open up the **Preparing for Integration** branch:



```
▶ Computing Initial Values
▼ Preparing for Integration
    Preparing for Integration...
    Generating code (derivatives)
    Begin C code translation/compile
    Initial processing and procedure decode
    SelectCompiler: Check for installed compiler successful
    Type detection and C preprocessing
    Generating code to file
    Compiling and linking code
    C code translation/compile complete
    Finished preparing for integration (8.497s)
```

5. Verify that you see `SelectCompiler: Check for installed compiler successful`.

If you do not see the message above but instead see **SelectCompiler: Check for installed compiler failed, using built-in,** please ensure that you have done the correct setup and if issues still remain please contact Maplesoft Technical Support at support@maplesoft.com.

Maplesoft