

Lecture one

Introduction to simulink

1. Introduction to Simulink

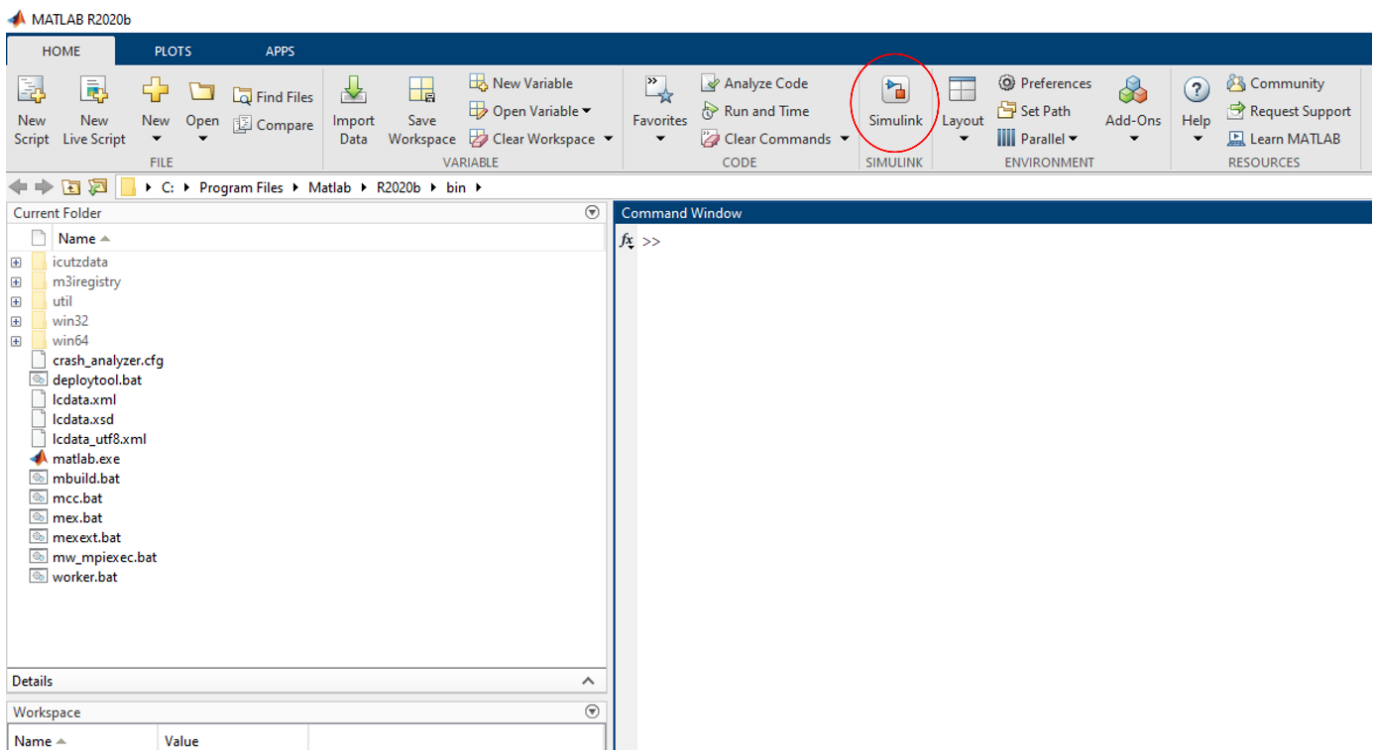
Simulink, developed by The MathWorks, is a commercial tool for modeling, simulating, and analyzing dynamic systems. Its primary interface is a graphical block diagramming tool and a customizable set of block libraries. It offers tight integration with the rest of the MATLAB environment and can either drive MATLAB or be scripted from it. Simulink is widely used in control theory and digital signal processing for simulation and design.

Simulink is an environment for simulation and model-based design for dynamic and embedded systems. It provides an interactive graphical environment and a customizable set of block libraries that let you design, simulate, implement, and test a variety of time-varying systems, including communications, controls, signal processing, video processing, and image processing.

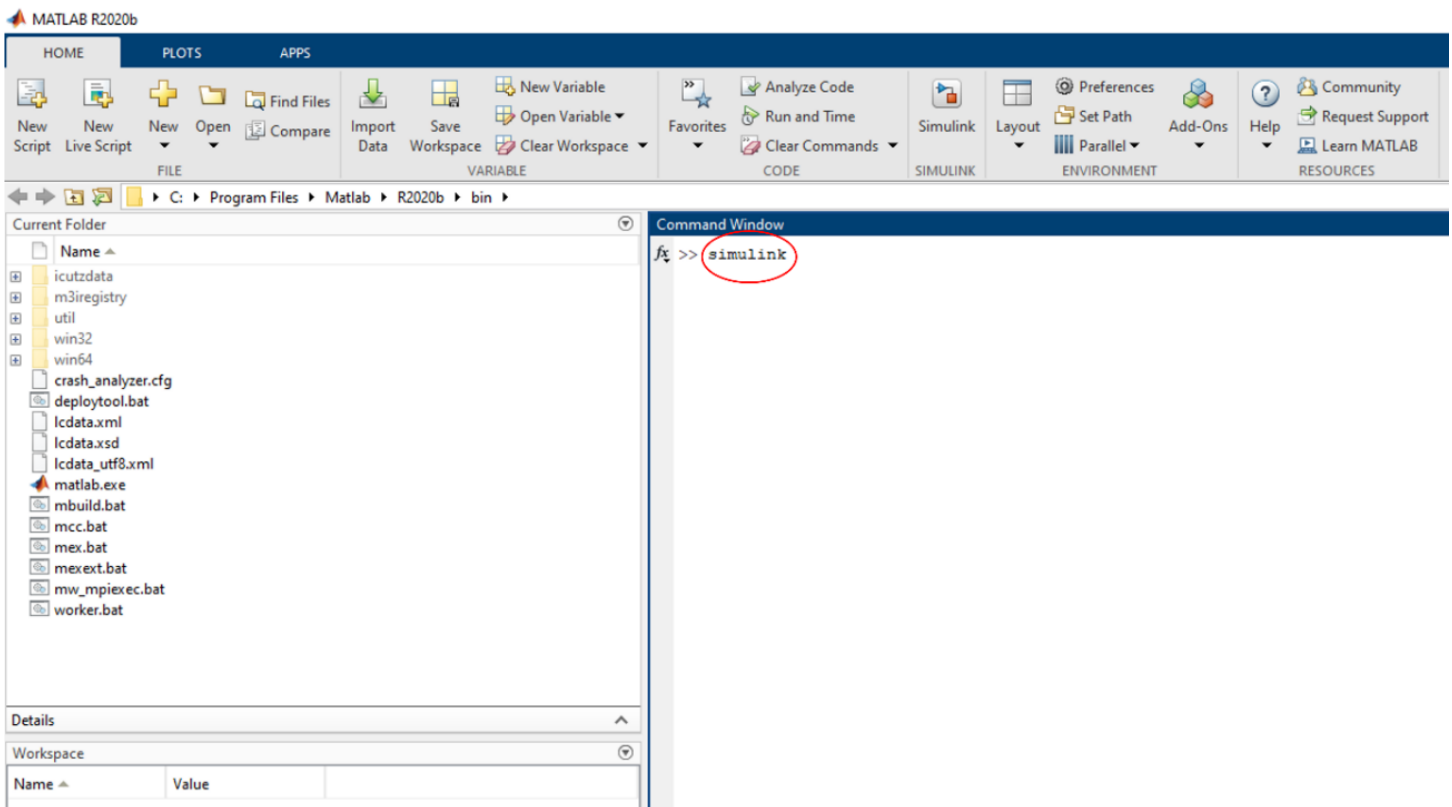
2. Start using Simulink

To start Simulink from the MATLAB:

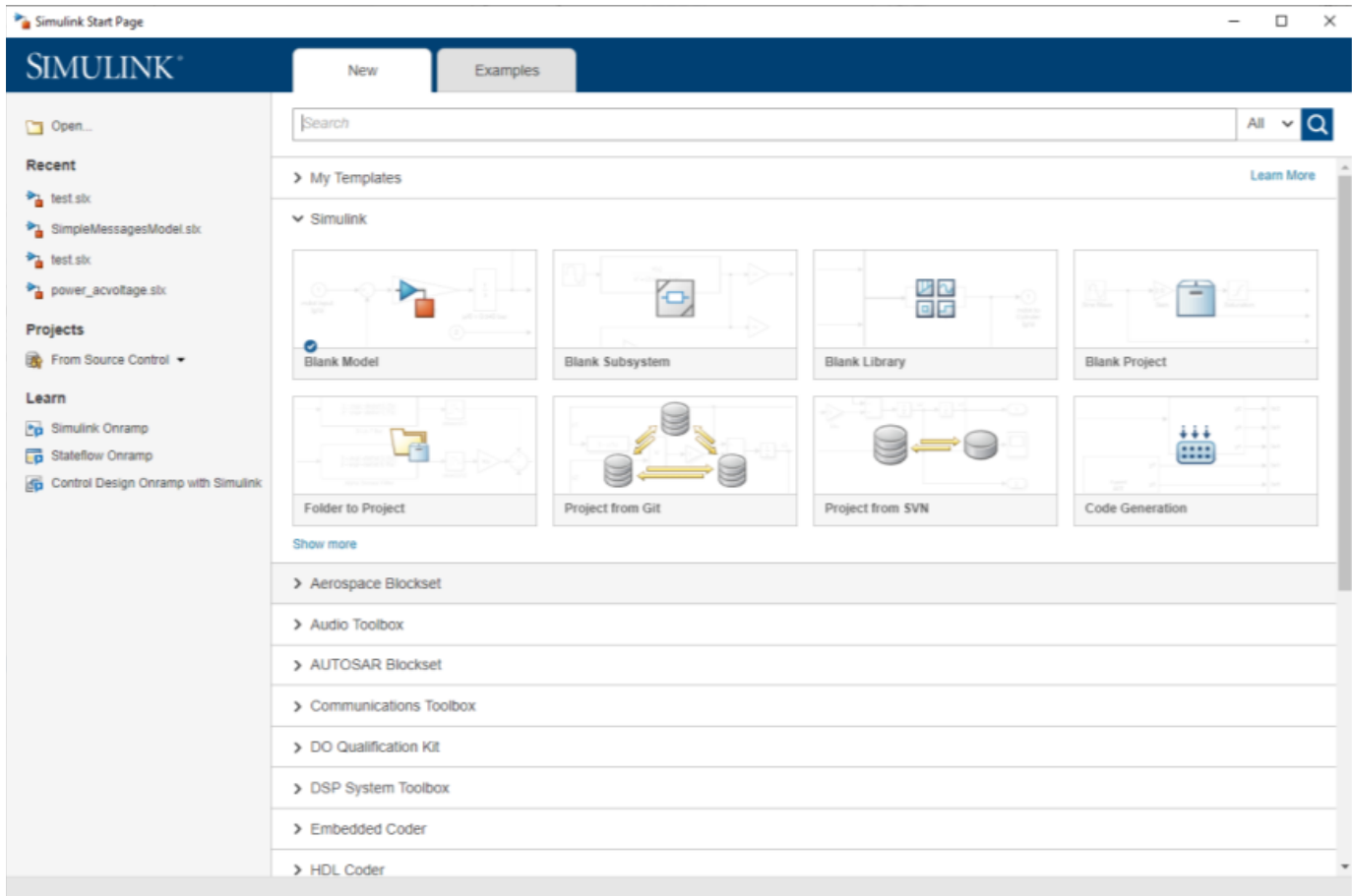
Open MATLAB and select the Simulink icon in the Toolbar:



Or type “**simulink**” in the Command window, like this:



Then the following window appears (Simulink start page):



It shows: the Blank Model, Blank Subsystem, Blank Library, Blank Project,

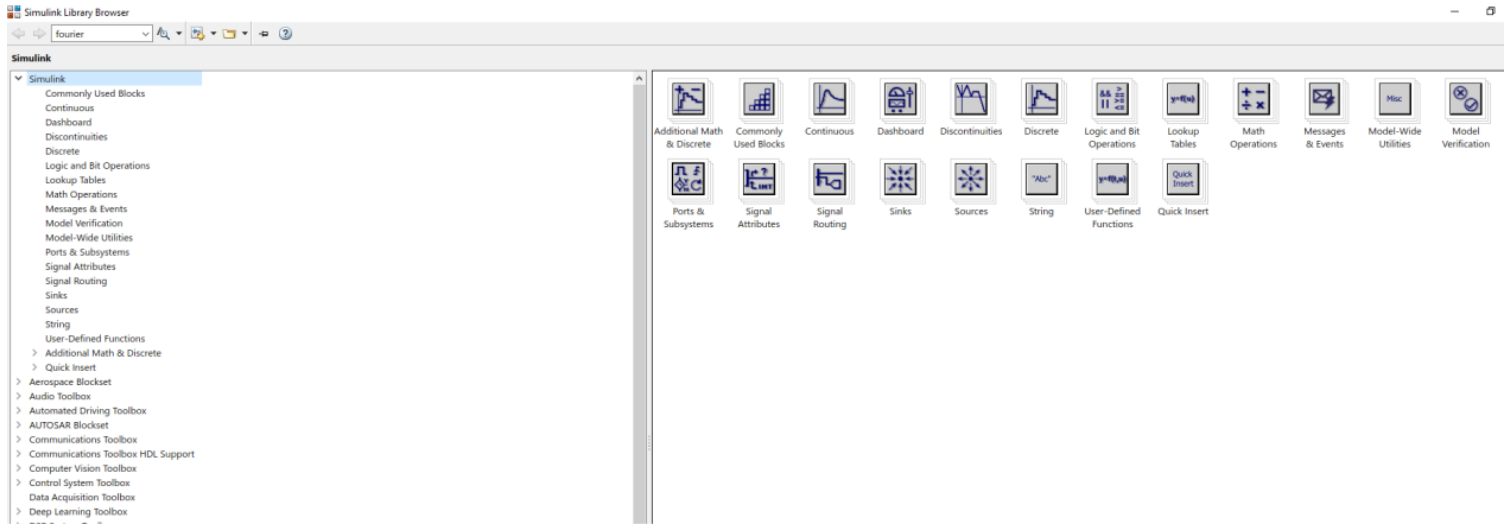
Simulink Library Browser

The **Simulink Library Browser** is the library where you find all the blocks you may use in Simulink. So, there is an extensive library of functions commonly used in modeling a system. These include:

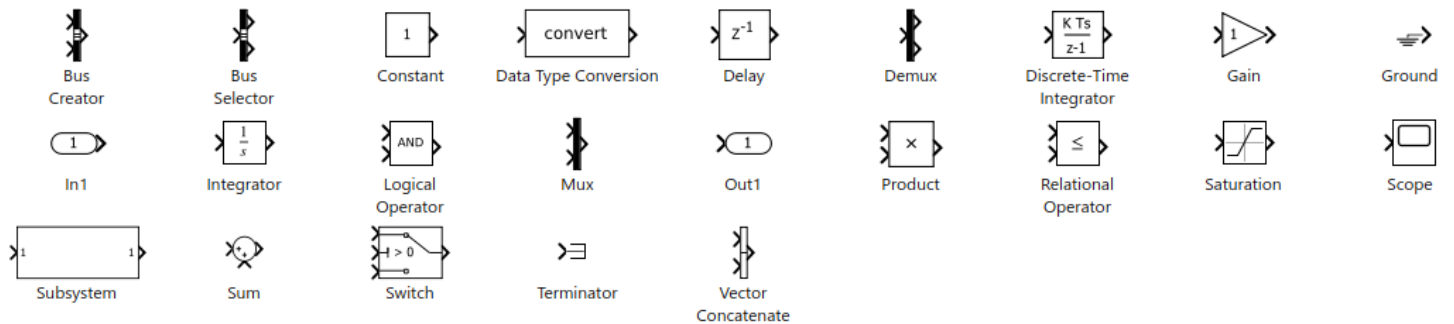
- Continuous and discrete dynamics blocks, such as Integration, Transfer functions, Transport Delay, etc.
- Math blocks, such as Sum, Product, Add, etc
 - Sources, such as Ramp, Random Generator, Step, etc

Block Libraries

Here are some commonly used **Continuous** Blocks:

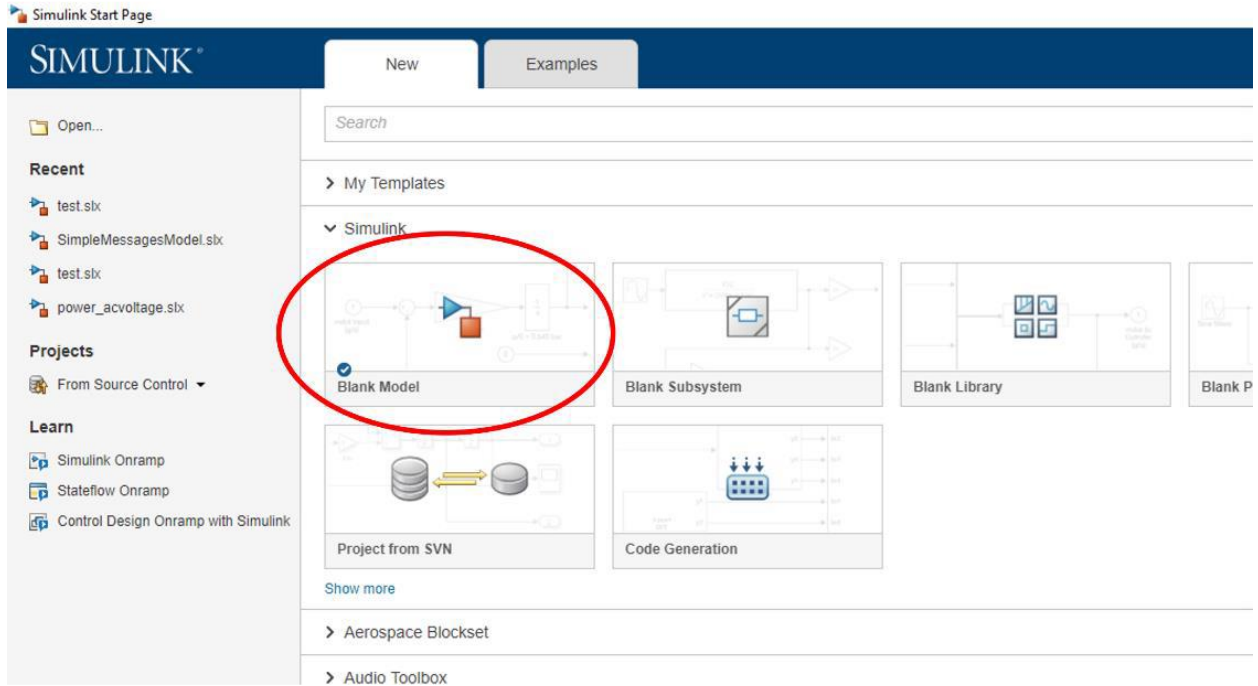


In addition, there are lots of block in different Toolboxes:

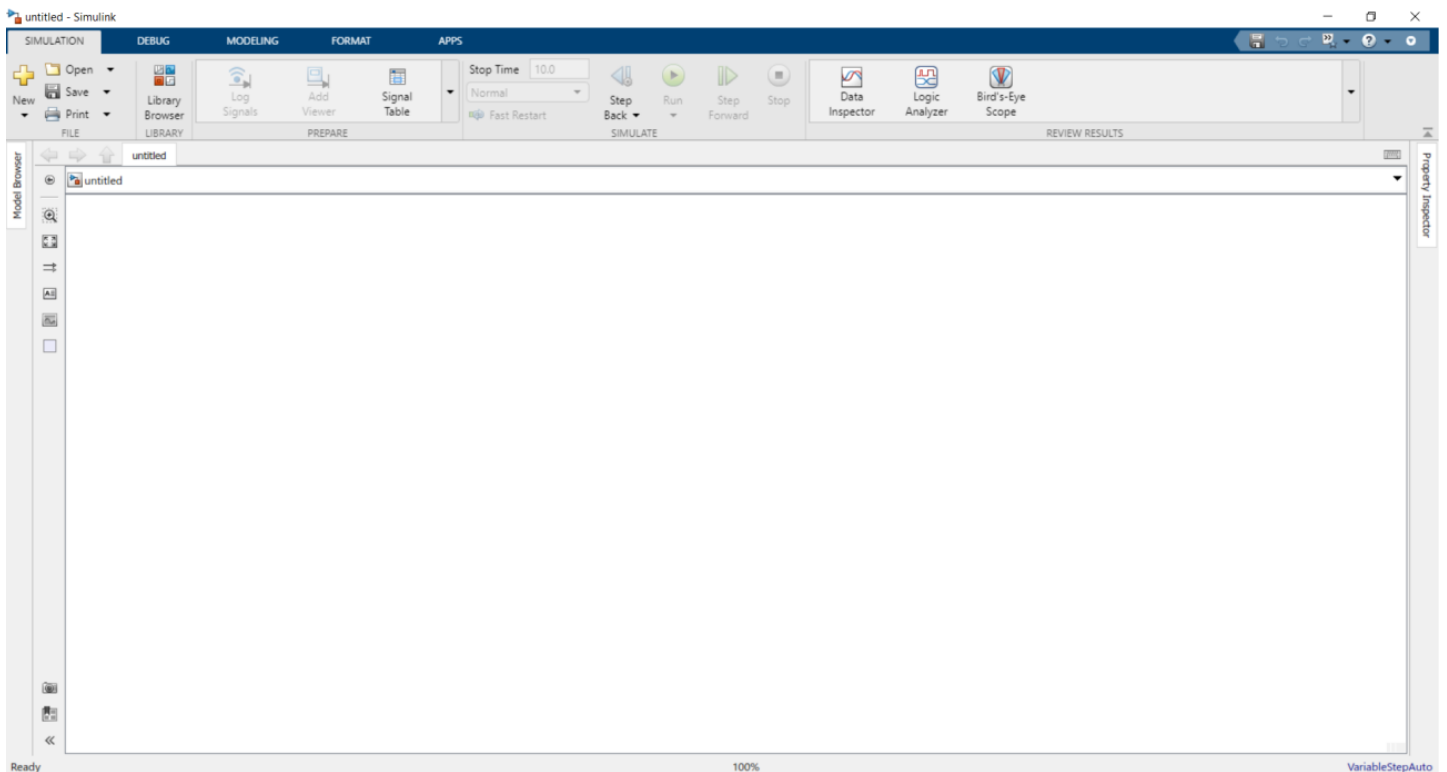


Create a new Model

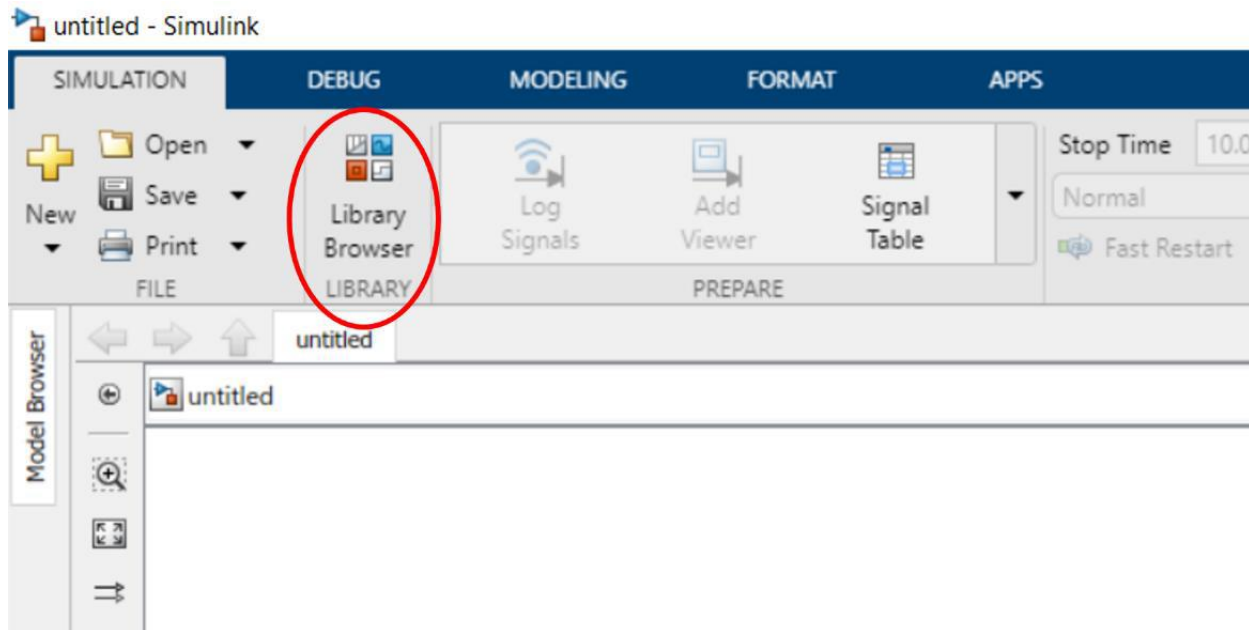
Click the Blank Model in order to create a new Simulink model:



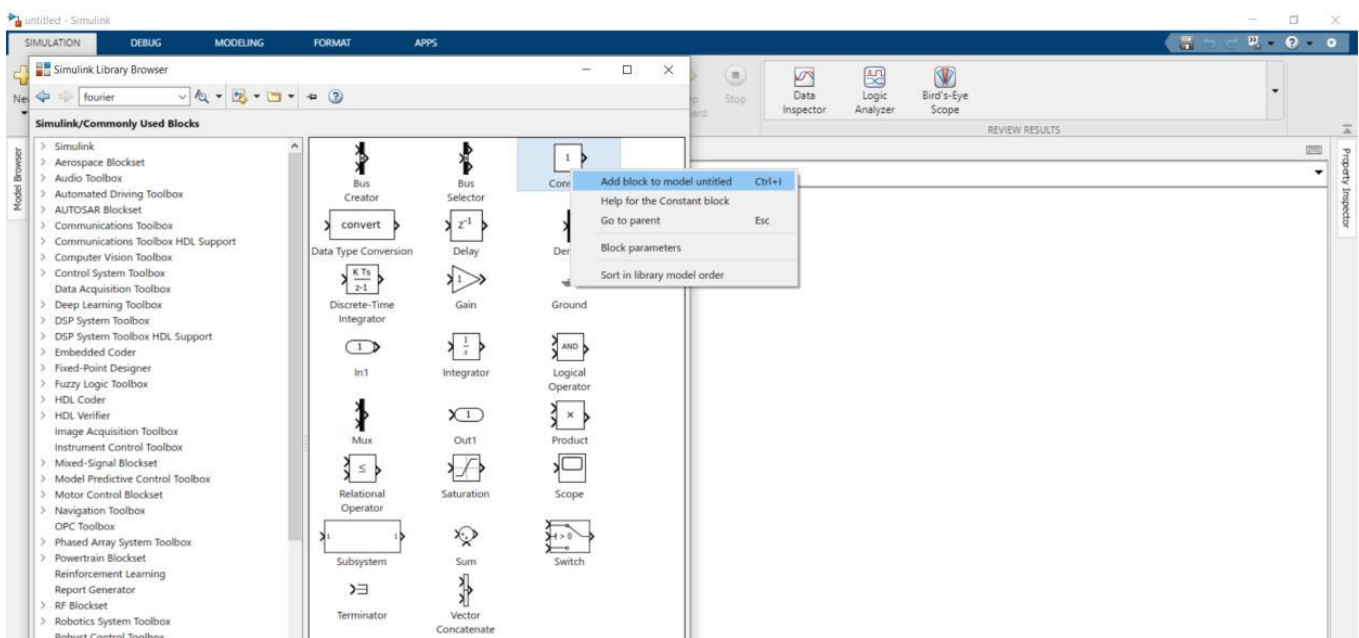
The following window appears:



By press on the library browser icon, located on the deskbar, a list of library block will appear.



You may now drag the blocks you want to use from the Simulink Library Browser to the model surface (or right-click on a block and select “Add to...”).



Example1: In this example we will:

- Place (drag and drop or add) two blocks, a Sine Wave, and a Scope, on the model surface
- Name the Blocks
- Change the input amplitude and the frequency
- Simulate the Model
- Read the output on the Oscilloscope



Example2: Simulate the following:

- Two sine waves input, both having a 5 V amplitude, 1 kHz, and a phase shift of 90 degree.
- Read the input using two channel scope.

