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Lecture 03c
Simulink

The YouTube video(s) covering this lecture are located at:

-'Getting Started with Simulink' (https://youtu.be/WLPvCefp6Qo)

-'Ordinary Differential Equations and Dynamic Systems in Simulink' (https://-youtu.be/Cvu2zWk3gYw)

-'Interacting with a Simulink Model from a Matlab Script' (https://youtu.be/sF_sjFqNFUk)

Outline

-Simulink

Simulink

Simulink is an optional package for Matlab which specializes in numerically solving differential equations. It is widely used in industry and academia for simulation, modeling, and control system design.

Setting the Stage For Simulink

Suppose that you have two functions

$y = f(x)$

$z = h(w, p)$

To make this clearer, let's use example functions for f and h

$f(x) = 2\,x + 4$

$h(w, p) = w^2\,\sqrt{p}$

We could implement the function f as a function in Matlab

```
function [varargout] = f(varargin)

x = varargin{1};
```

```
y = 2*x+4;

varargout{1} = y;
```

We can do the same for the function *h*

```
function [varargout] = h(varargin)

w = varargin{1};
p = varargin{2};

z = (w.^2).*sqrt(p);

varargout{1} = z;
```

We could then use these function in other code. For example, what if we had to do the manipulation

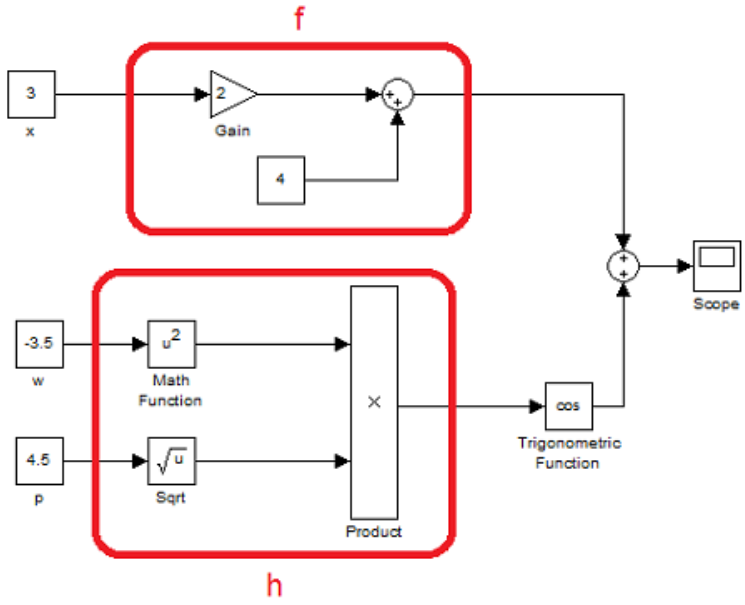
$$q = f(x) + \cos(h(w, p))$$

The appropriate code would be

```
x = ... %define value
w = ...%define value
p = ...%define value

q = f(x) + cos(h(w,p));
```

Simulink is a graphical way of visualizing these same operations and functions



Go to Simulink Tutorial.