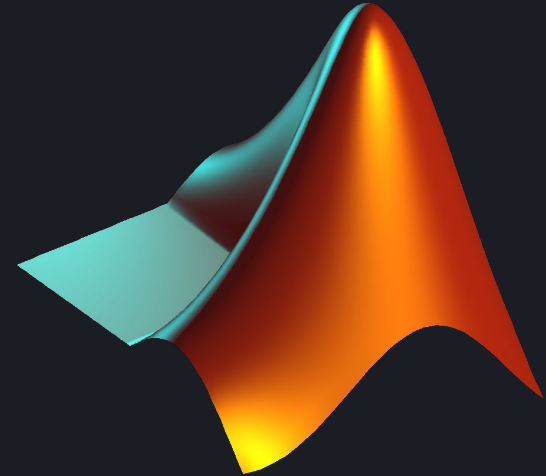


# Matlab Scripting Module

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## Session Content

- Automate repetitive Modeling and Simulation Tasks



# Matlab Scripting Module

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## Automate repetitive Modeling and Simulation Tasks

### Exercise: Create P-Controller Library Using Script File

In this exercise, you will create a P-Controller library using MATLAB script files. You will first create a script to design the P-Controller block and save it as a library. Then, you will create another script to instantiate the P-Controller block and connect it to a Step Input block for testing.

Here's how you can structure the exercise:

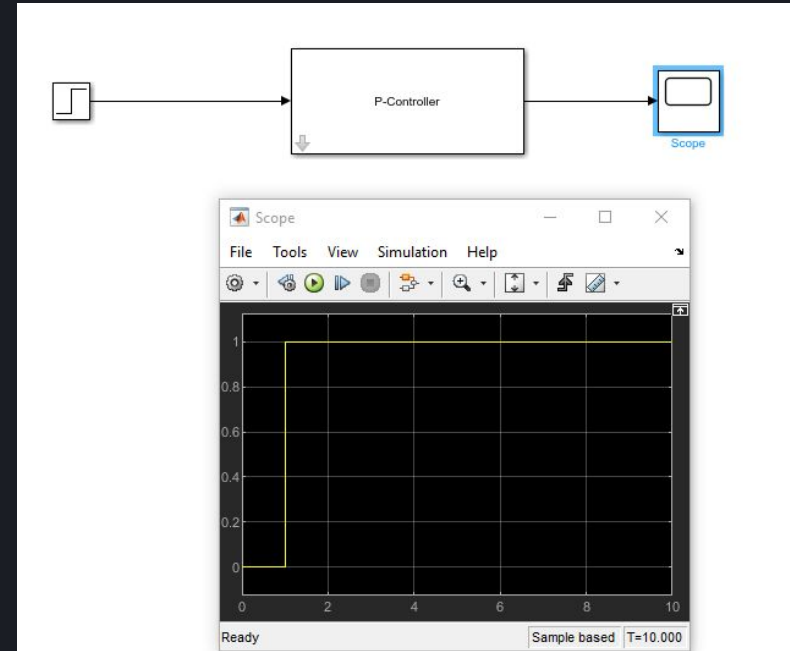
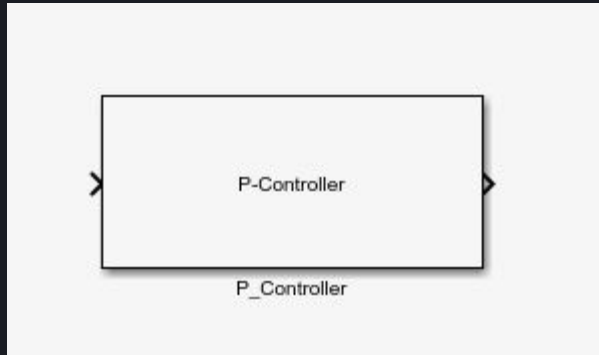
- Create a MATLAB script to design the P-Controller block and save it as a library.
- Create another MATLAB script to instantiate the P-Controller block and connect it to a Step Input block for testing.



# Matlab Scripting Module

## Automate repetitive Modeling and Simulation Tasks

### Exercise: Create P-Controller Library Using Script File



# Matlab Scripting Module

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## Automate repetitive Modeling and Simulation Tasks

### Exercise: Create Counter Using Script File

In this exercise, you will create a Counter using MATLAB script files. You will first create a script to design the Counter block and save it as a model.

Here's how you can structure the exercise:

- Create a MATLAB script to design the Counter block and save it as a model.

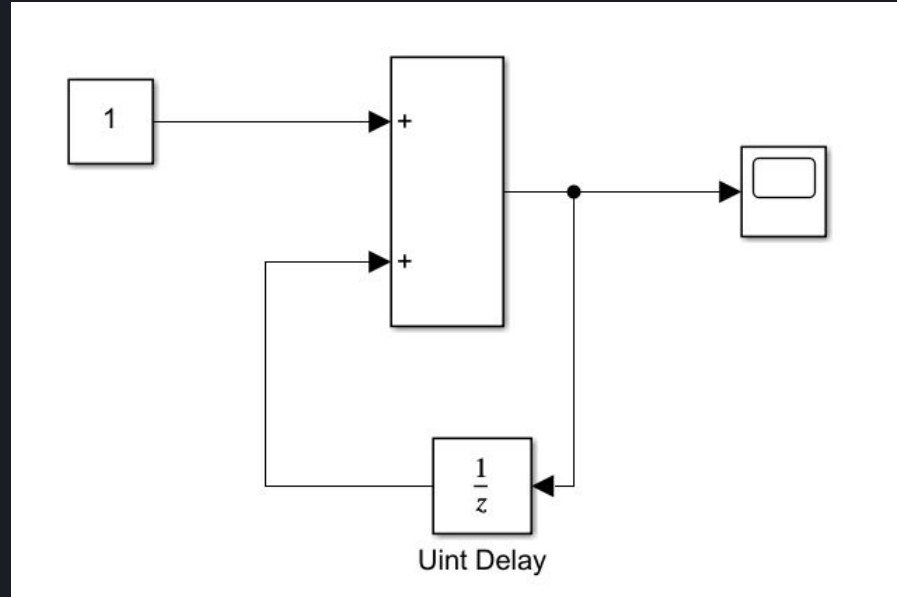


# Matlab Scripting Module

## Automate repetitive Modeling and Simulation Tasks

### Exercise: Create Counter Using Script File

Now, it is required to show the name of unit delay



# Matlab Scripting Module

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## Automate repetitive Modeling and Simulation Tasks

**`find_system(model,'criteria');`**

- The `find_system` function in MATLAB's Simulink environment is used to search for blocks and systems in a Simulink model based on specified criteria. It allows you to programmatically locate blocks and systems within a model, which can be useful for tasks such as automation, analysis, and debugging.
- `model` is the name of the Simulink model or a handle to the model.
- `'criteria'` is a string specifying the search criteria. This can include various options such as block type, block name, block parameter values, etc.

# Matlab Scripting Module

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## Automate repetitive Modeling and Simulation Tasks

`find_system(model,'criteria');`

- Find all blocks of a specific type
- This will find all Gain blocks in the Simulink model named 'myModel'.

```
blocks = find_system('myModel', 'BlockType', 'Gain');
```

# Matlab Scripting Module

---

## Automate repetitive Modeling and Simulation Tasks

`find_system(model,'criteria');`

- Find all blocks with a specific name
- This will find all blocks with the name 'Controller' in the Simulink model named 'myModel'.

```
blocks = find_system('myModel', 'Name', 'Controller');
```



# Matlab Scripting Module

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## Automate repetitive Modeling and Simulation Tasks

`find_system(model,'criteria');`

- Find all blocks with a specific parameter value
- This will find all blocks with the parameter 'Gain' set to '2' in the Simulink model named 'myModel'.

```
blocks = find_system('myModel', 'Gain', '2');
```

# Matlab Scripting Module

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## Automate repetitive Modeling and Simulation Tasks

`find_system(model,'criteria');`

- Find all blocks within a specific subsystem
- This will find all blocks within the subsystem named 'Subsystem1' in the Simulink model named 'myModel', considering only blocks at the first level of hierarchy.

```
blocks = find_system('myModel/Subsystem1', 'SearchDepth', 1);
```

# Matlab Scripting Module

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## Automate repetitive Modeling and Simulation Tasks

`find_system(model,'criteria');`

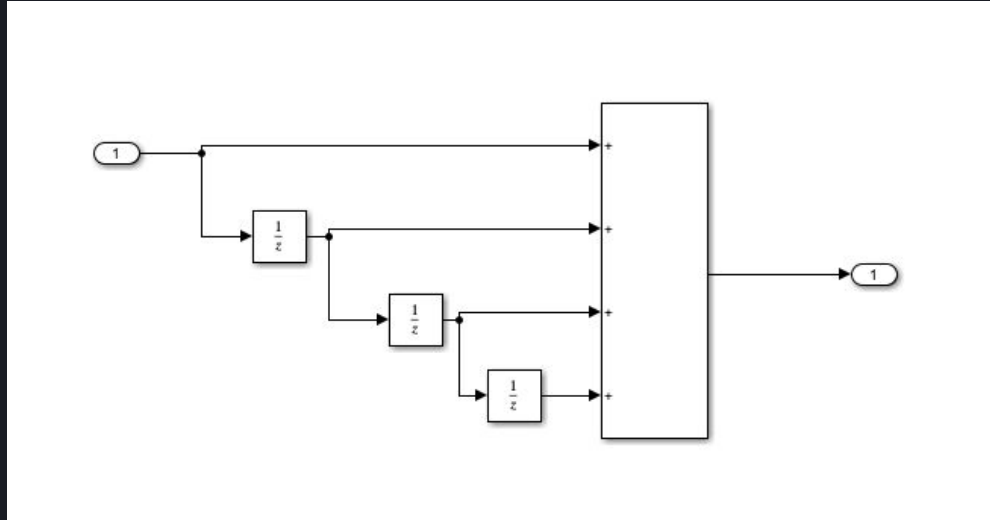
- Find all blocks matching multiple criteria
- This will find all Gain blocks with the name 'Controller' in the Simulink model named 'myModel'.

```
blocks = find_system('myModel', 'BlockType', 'Gain', 'Name', 'Controller');
```

# Matlab Scripting Module

## Automate repetitive Modeling and Simulation Tasks

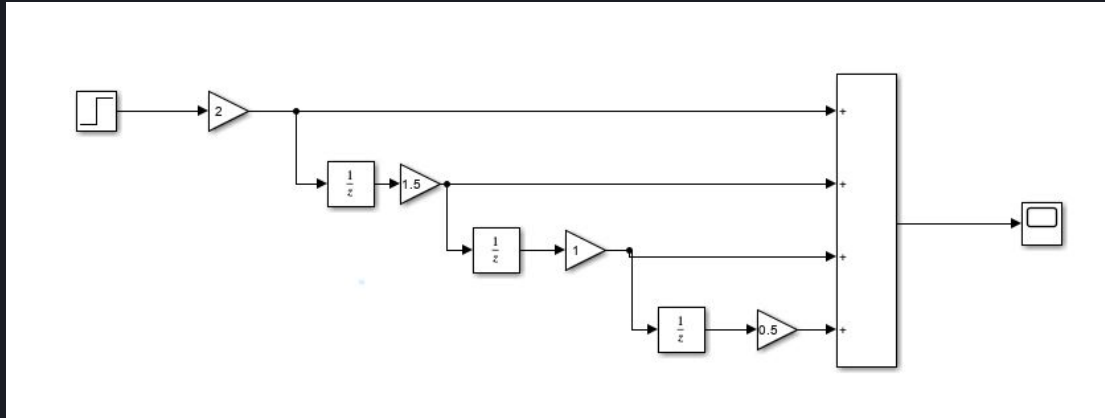
Exercise: Required to show the name of unit delay



# Matlab Scripting Module

## Automate repetitive Modeling and Simulation Tasks

Exercise: Required to set the sample of all gain blocks

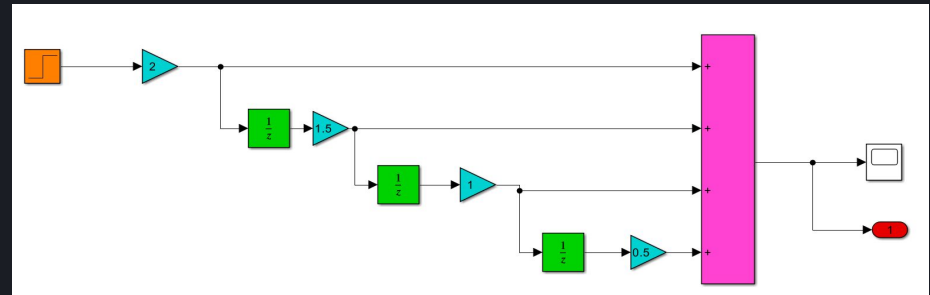
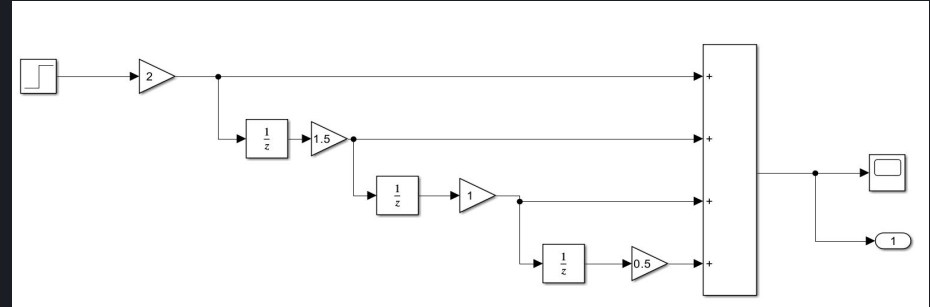


# Matlab Scripting Module

## Automate repetitive Modeling and Simulation Tasks

**Exercise: Required to programmatically color the blocks based upon their blocks types**

- in case “Step” orange background.
- in case “Gain” Cyan background
- in case “UnitDelay” Green background
- in case “Sum” Magenta background
- in case “outport” Red background



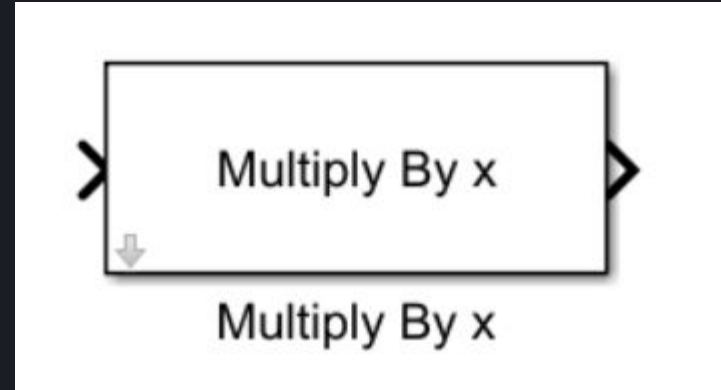
# Matlab Scripting Module

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## Automate repetitive Modeling and Simulation Tasks

### Exercise: Required to programmatically subsystem Multiply By x

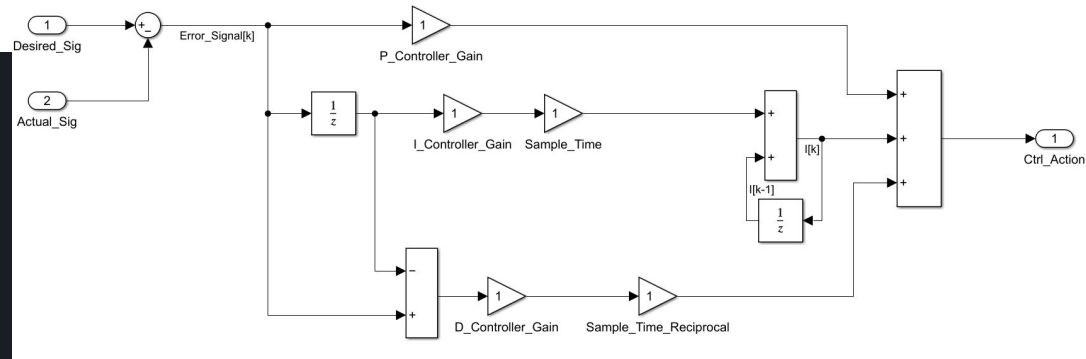
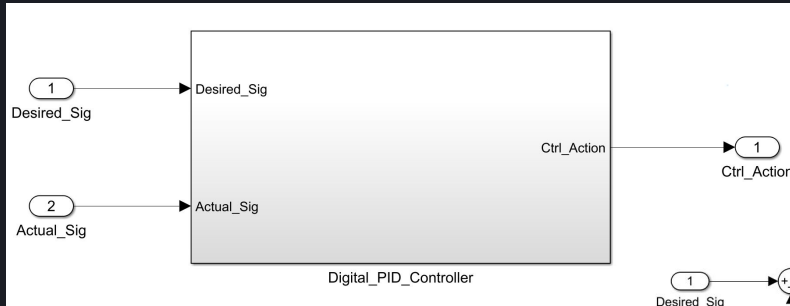
- Implement function take model name and value of x then create the model contain subsystem



# Matlab Scripting Module

## Automate repetitive Modeling and Simulation Tasks

### Exercise: Required to programmatically Digital PID Controller

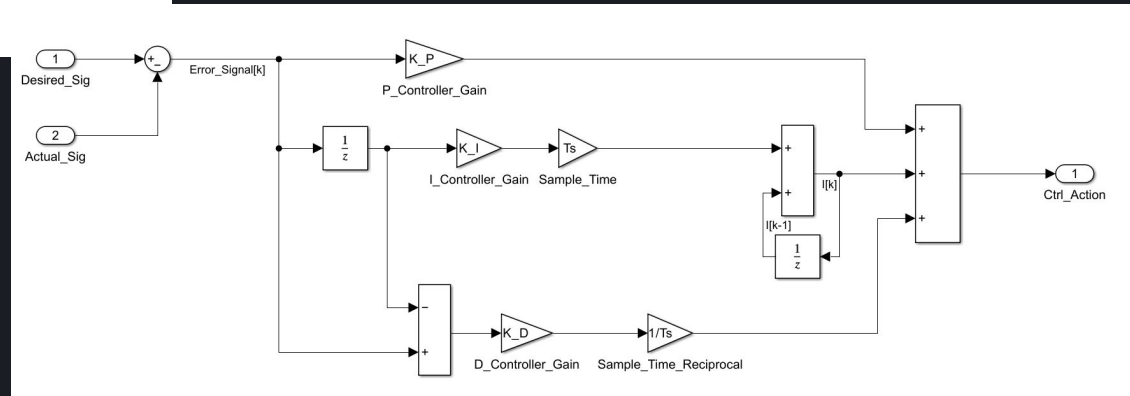
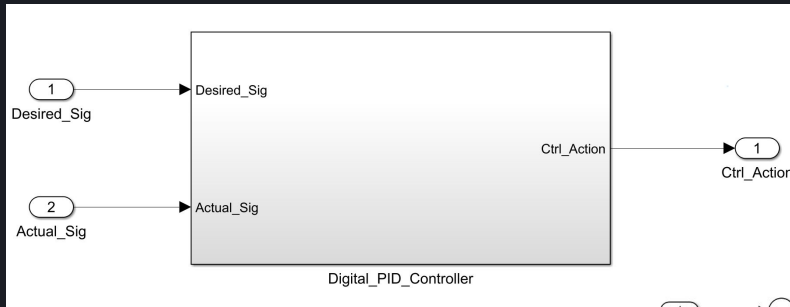




# Matlab Scripting Module

## Automate repetitive Modeling and Simulation Tasks

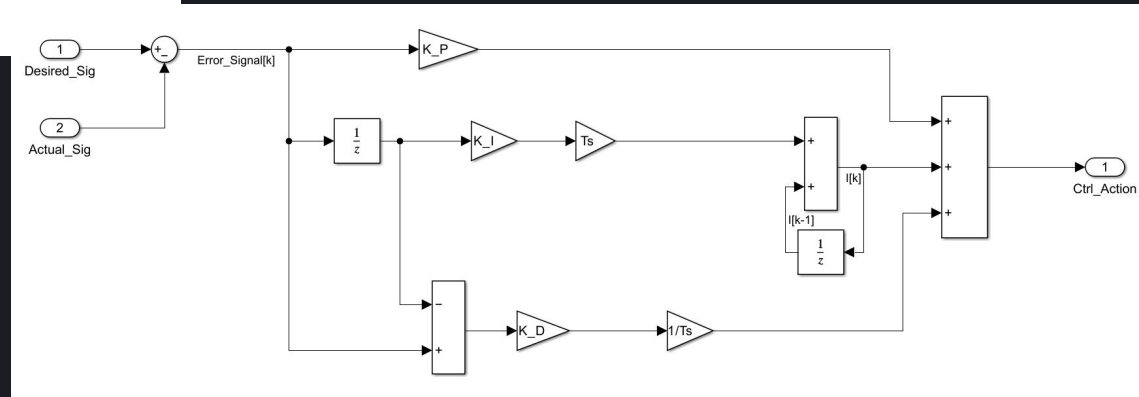
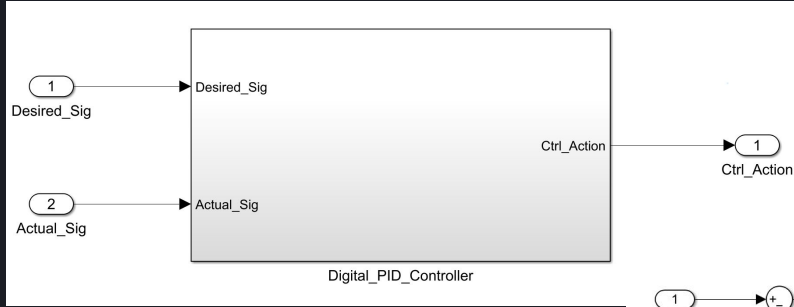
### Exercise: Required to programmatically Digital PID Controller



# Matlab Scripting Module

## Automate repetitive Modeling and Simulation Tasks

### Exercise: Required to programmatically Digital PID Controller



Model-Based Development Program

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Thank You!