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Calling Python from MATLAB

This reference shows common use cases but is by no means comprehensive. The >> icon provides links to relevant sections of the MATLAB® documentation. For general information, see https://www.mathworks.com/products/matlab/matlab-and-python.html.

Setup

Requirements >>
To call Python® from MATLAB, you need to have both installed on your system.

Configuration
Access settings and the status of the Python interpreter:

```
>> pe = pyenv
```

Specify which version to use:

```
>> pe = pyenv("Version","3.9")
```

Ensure the `PYTHONHOME` environment variable aligns with your Python version. To view its value in MATLAB:

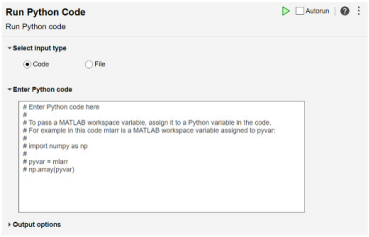
```
>> getenv("PYTHONHOME")
```

Ensure the appropriate versions are on the system path:

```
>> getenv("PATH")
```

Run Python Code in MATLAB

Live Editor Task
The `Run Python Code` task lets you interactively run Python code or files, then generate the code.



Call Python Statements
To execute a few lines of code:

```
>> outvars = pyrun(code,outputs)
>> x = pyrun("a = b*c","a", b =
5, c = 10)
```

Call Python Script >>
To execute code organized in a script:

```
>> outvars =
pyrunfile(file,outputs)
```

Call Python Modules and Functions

```
>> py.module _
name.function _ name
>> x = py.math.sqrt(42)
```

Pass Keyword Arguments
Either call directly or use `pyargs`:

```
>>> foo(5,bar=42)
>> py.foo(5,bar=42)
>> py.foo(5,pyargs('bar',42))
```

Reload Modules
Reload the module after making updates:

```
>> py.importlib.reload(module)
```

Data Type Conversions

Data types will be automatically converted where possible. >>

MATLAB	Python
`Double, single`	`Float`
`complex single Complex double`	`Complex`
`(u)int8, (u)int16, (u)int32,(u)int64`	`int`
`NaN`	`Float(nan)`
`Inf`	`Float(inf)`
`String, char`	`Str`
`Logical`	`Bool`
`Dictionary`	`dict`
`Struct`	`dict`
`Table`	`Py.pandas. dataframe`
`Datetime`	`Py.datetime. datetime`
`Duration`	`Py.datetime. timedelta`

Note: The default numeric type is integer in Python and double in MATLAB.

Data Science Libraries

Apache Parquet >>

Use Apache® Parquet to efficiently transfer data.
From MATLAB:

```
>> tbl = parquetread(fname)
>> parquetwrite(tbl,fname)
```

From Python:

```
>>> df = pandas.read _ parquet(fname)
>>> pandas.Dataframe.to _ parquet(df)
```

Deep Learning >>
Access models in MATLAB with importers for TensorFlow™, PyTorch®, and ONNX™.

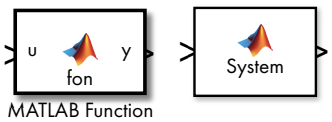
```
>> net = importKerasNetwork(model)
```

Integrate Python and Simulink

Python Importer >>
You can use the Python Importer to import Python modules and packages to Simulink®. Open the importer:

```
>> obj = Simulink.
PythonImporter();
>> obj.view();
```

MATLAB Function Block and MATLAB System Block >>



Implement Python modules in Simulink using MATLAB Function block or MATLAB System block.