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Using MATLAB® and Python® Together

The ≥ icon provides links to relevant sections of the MATLAB documentation to learn more.

Call Python in MATLAB

Access settings and status of Python interpreter:

```
>> pe = pyenv
```

Specify version to use:

```
>> pe = pyenv("Version",3.7)
```

Call Python modules and functions:

```
py.module_name.function_name

>> py.math.sqrt(42)
```

Pass keyword arguments

Use pyargs to pass keyword arguments

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

Reload modules

Reload the module after making updates:

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

Call MATLAB in Python

Install MATLAB Engine API for Python ≥

Run `setup.py` from an OS command window

```
$ cd [matlabroot]/extern/engines/python
$ python setup.py install
```

Call MATLAB functions

Import the module and start the engine

```
>>> import matlab.engine
>>> eng =
    matlab.engine.start_matlab()
```

Call functions through the engine

```
>>> x = eng.sqrt(42.0)
```

Capture multiple outputs

```
>>> x = eng.gcd(42.0,8.0,nargout=3)
```

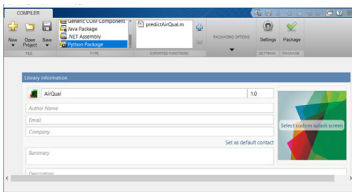
Stop the engine

```
>>> eng.exit()
```

Create Python Package

Package MATLAB functions ≥

Use the Library Compiler App to create a Python package for MATLAB functions



Invoke MATLAB functions from the Python package

```
>>> import PackageName
>>> pkg =
PackageName.initialize()
>>> result = pkg.foo()
```

Close package

```
>>> pkg.terminate()
```

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
Structure	dict
Vectors	array.array()
Cell array	list, tuple

Some MATLAB data types need to be converted.

MATLAB	Conversion Function
categorical	char
string	char
table	table2struct
timetable	timetable2struct
datetime	char

Note: The default numeric type is integer in Python and double in MATLAB when typing `42`

To create a float in Python:

```
>>> x = 42.0
>>> x = float(42)
```

Create integer from MATLAB:

```
>> x = int32(42)
```

Data Science Libraries

Apache Parquet ≥

Use Apache Parquet to efficiently transfer tabular data

From MATLAB:

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

From Python:

```
>>> df = pandas.read_parquet(fname)
>>> pandas.Dataframe.to_parquet(df)
```

Deep Learning ≥

Access frameworks in MATLAB with importers for Tensorflow-Keras, ONNX, etc

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