# Kernels

And customizing Jupyter

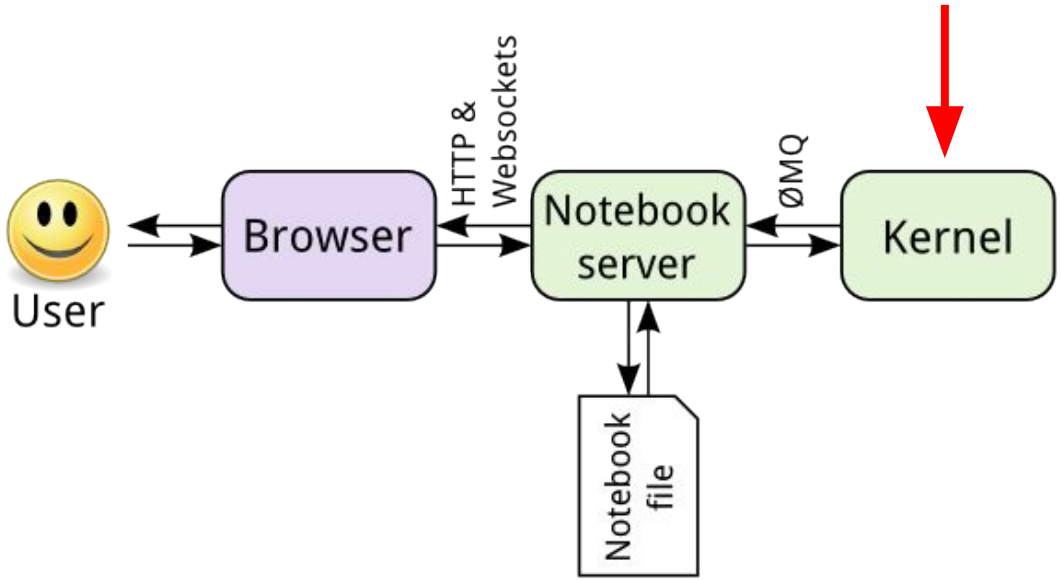
# What is the kernel

A **kernel** provides programming language support in Jupyter. IPython is the default kernel. Additional kernels include R, Julia, and many more.

Fun fact: Jupyter was named after **JU**lia **PY**Thon and **R** once the old IPython notebook started supporting other languages

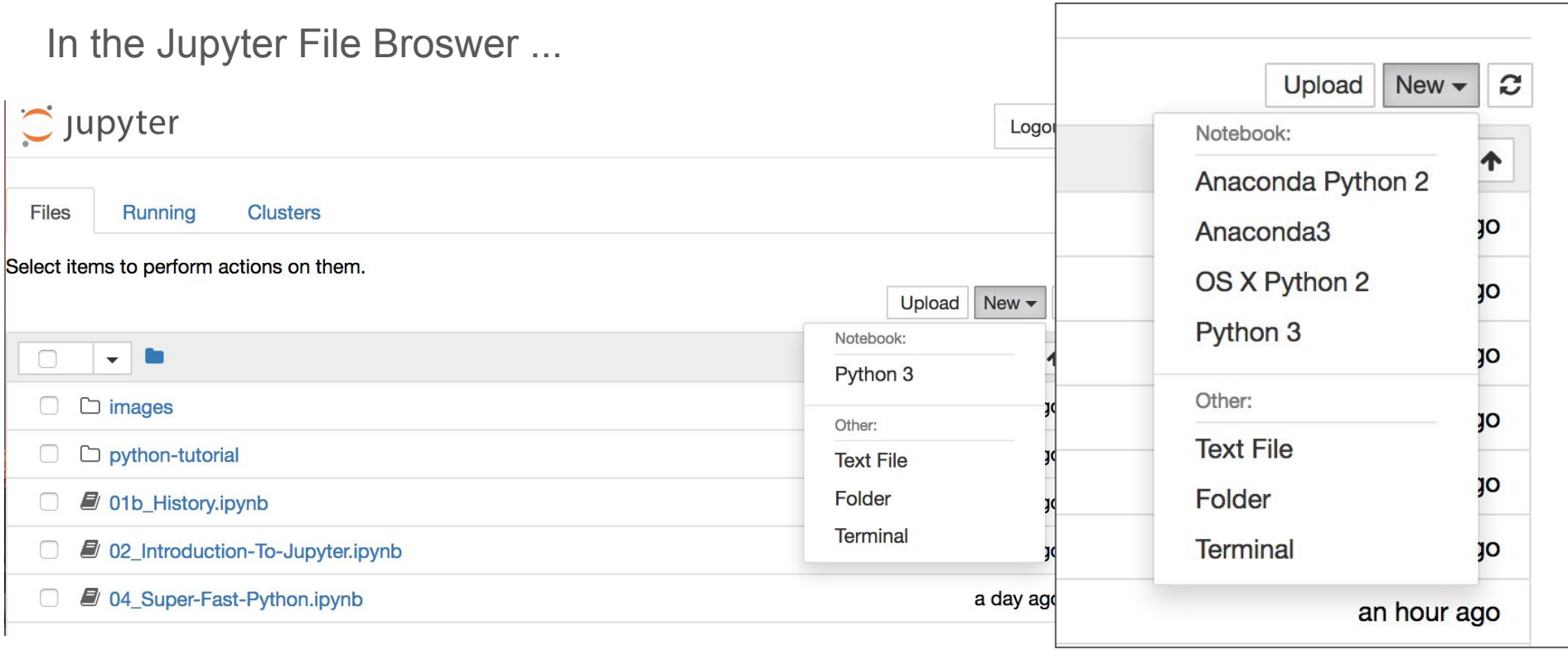


# Under the Covers



# Selecting a Kernel

In the Jupyter File Broswer ...



# Adding a New Kernel

Instructions will vary from each language but you basically install a package and write a kernel.json file

# Python 2

https://ipython.readthedocs.io/en/latest/install/kernel_install.html

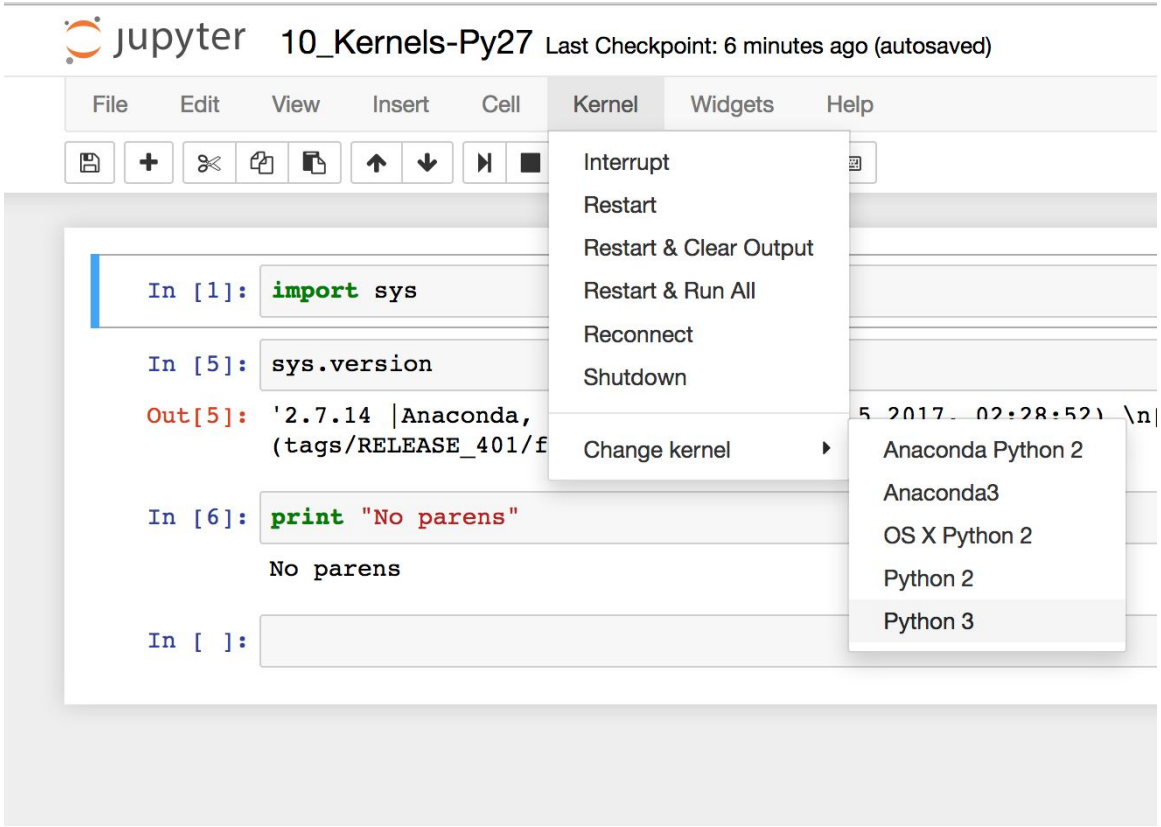
```
> conda create -n ipykernel_py2 python=2 ipykernel
> source activate ipykernel_py2 # Windows: remove 'source'
> python -m ipykernel install --user
```

Now restart jupyter and open up notebook 10b_Kernels-Py27.ipynb

# R

```
> conda install -c r r-essentials
```

# Switching Kernels




Re-run the notebook with a Python 3 kernel

# Where do Kernels Live?

Look for a kernel.json file in

**UNIX**

```
~/Library/Jupyter/kernels (Mac OS)
~/.local/share/jupyter/kernels (Linux)
{sys.prefix}/share/jupyter/kernels
/usr/share/jupyter/kernels
/usr/local/share/jupyter/kernels
```

**WINDOWS**

```
%APPDATA%\jupyter\kernels
%PROGRAMDATA%\jupyter\kernels
```

# Customizing the Kernel Spec (kernel.json)

```
{
 "argv": [
  "/Users/shreyas/anaconda2/bin/python",
  "-m",
  "IPython.kernel",
  "-f",
  "{connection_file}"
 ],
 "env": {
     "PATH": "/Users/shreyas/anaconda2/bin:/usr/local/bin:/usr/bin:/bin:/usr/sbin:/sbin",
     "PYTHONPATH": "/my/python/libs",
     "LD_LIBRARY_PATH": "/usr/local/lib"
 },
 "display_name": "Custom Python",
 "language": "python"
}
```

# Jupyter Settings

For command line options see

```
> jupyter notebook --help
```

Options can also be set by creating a file named `jupyter_notebook_config.py` in your Jupyter folder (`$HOME/.jupyter`).

To create a jupyter_notebook_config.py file, with all the defaults commented out, you can use the following command line:

```
> jupyter notebook --generate-config
```

# Let’s change the Jupyter Default Directory

Edit `.jupyter/jupyter_notebook_config.py`

Change

```
#c.NotebookApp.notebook_dir = ''
```

to

```
c.NotebookApp.notebook_dir = '/'
```

Restart the notebook and notice where you are in the file browser!