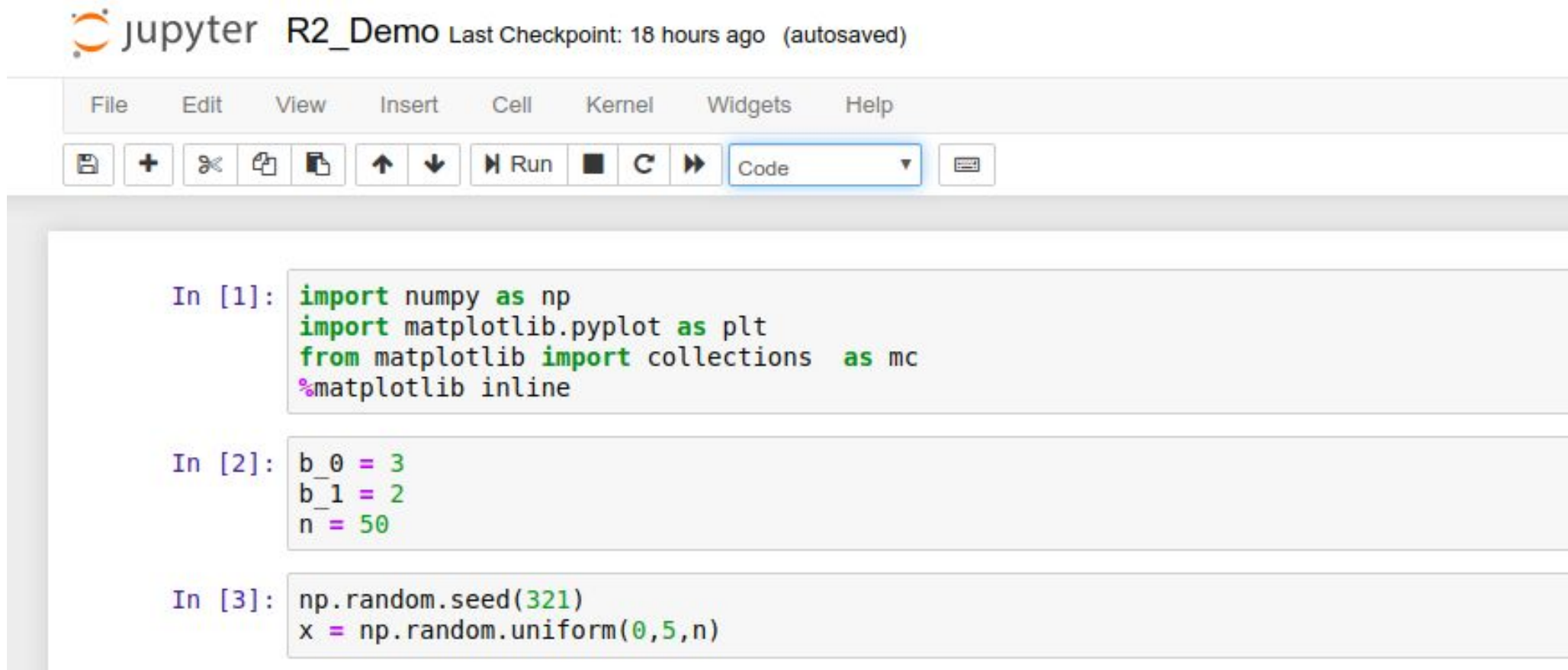




# Getting Started with Jupyter Notebooks

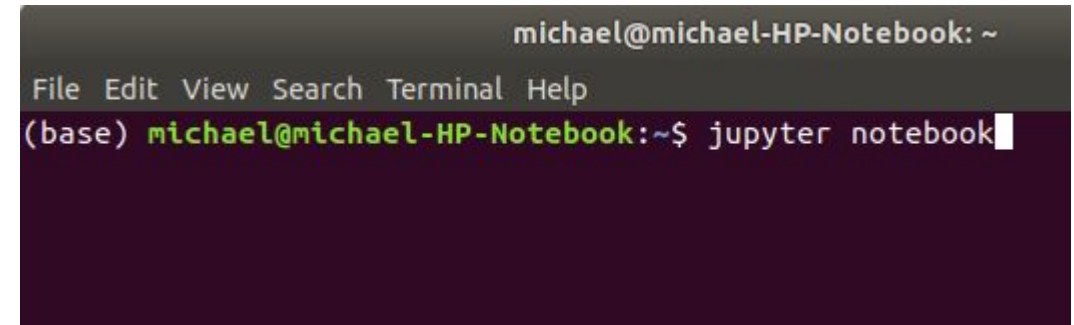
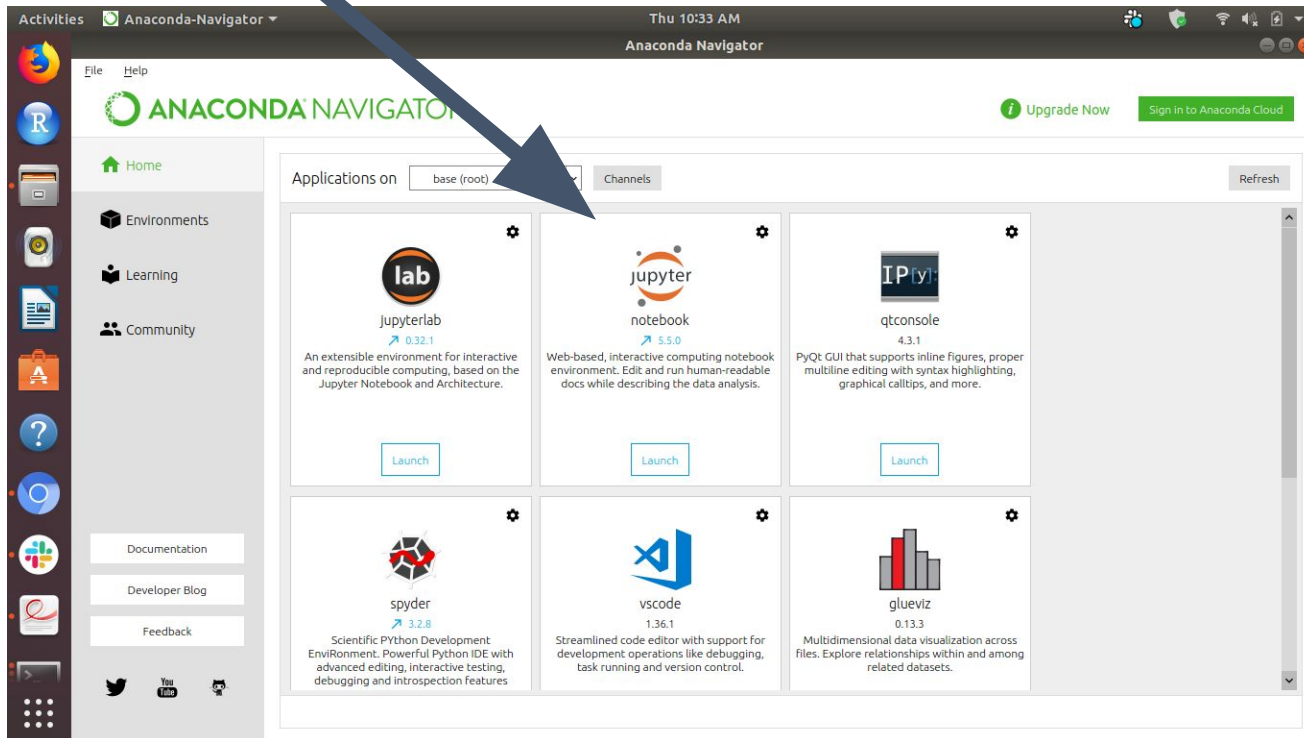
# Jupyter Notebooks

A web application that allows you to create and share documents that contain live code, equations, visualizations and narrative text.



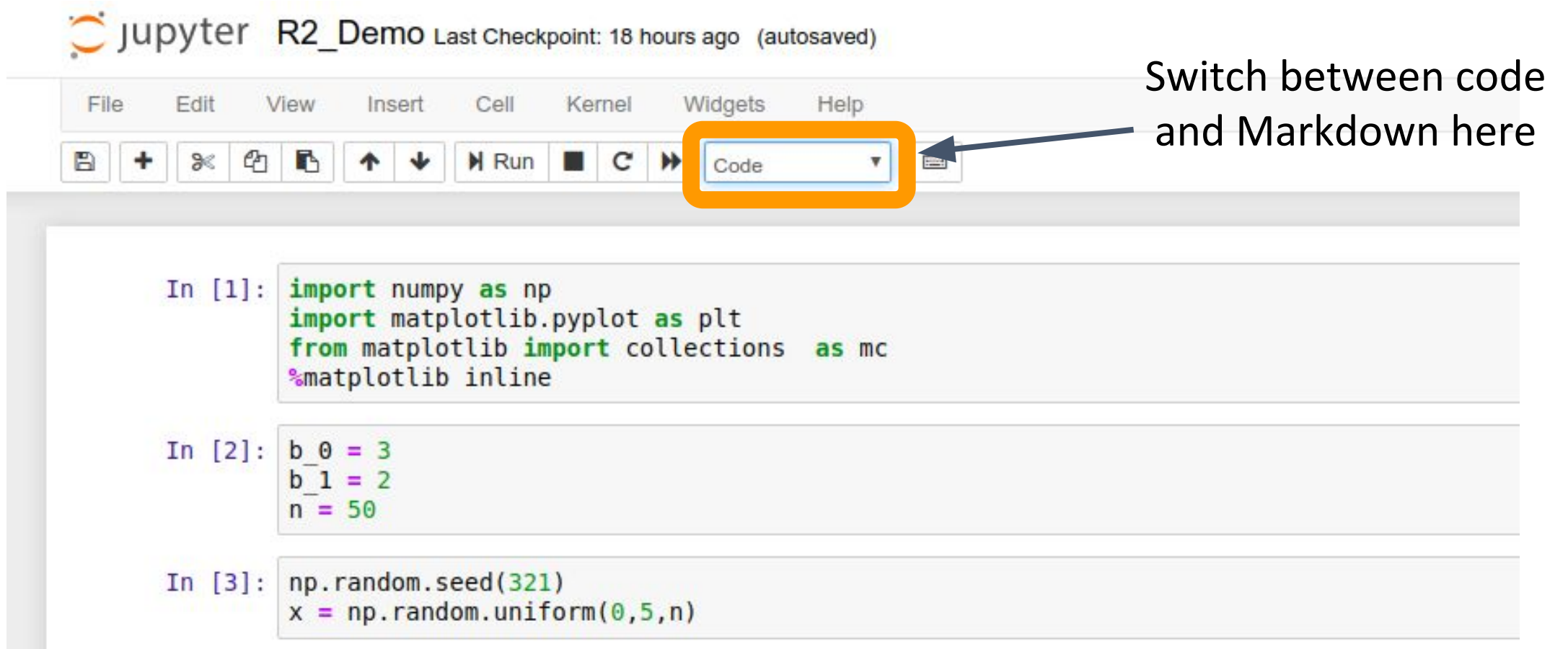
# Jupyter Notebooks

Can be launched either from Anaconda Navigator or by using the 'jupyter notebook' command from the terminal.



# Jupyter Notebooks

Notebooks are divided into cells, which contain either code or Markdown, which can be used to annotate your work.



The screenshot shows the Jupyter Notebook interface for a file named "R2\_Demo". The top bar indicates the last checkpoint was 18 hours ago and it was autosaved. Below the top bar is a menu bar with options: File, Edit, View, Insert, Cell, Kernel, Widgets, and Help. Under the "Cell" menu, there is a toolbar with icons for saving, adding, deleting, duplicating, moving up/down, running, and a dropdown menu currently set to "Code". An orange box highlights this dropdown menu, and an arrow points to it with the text "Switch between code and Markdown here". The main area of the notebook contains three code cells:

```
In [1]: import numpy as np
import matplotlib.pyplot as plt
from matplotlib import collections as mc
%matplotlib inline
```

```
In [2]: b_0 = 3
b_1 = 2
n = 50
```

```
In [3]: np.random.seed(321)
x = np.random.uniform(0,5,n)
```

# Jupyter Notebooks

To run code:

- Ctrl + Enter : Run cell and remain in cell
- Shift + Enter : Run cell and move to next
- Alt + Enter: Run cell and insert new cell below

Notebooks have lots of shortcuts and ways to make you more efficient (tab-completion is your friend).

For example, Shift + Tab inside a function to bring up docstring

## Resources:

<https://www.cheatography.com/weidadeyue/cheat-sheets/jupyter-notebook/>  
<https://www.dataquest.io/blog/jupyter-notebook-tips-tricks-shortcuts/>

# Errors happen!!

- Opportunity to gain knowledge
- Read the output (stack trace) from the bottom up to see the error and what caused it
- If you have no idea what is causing the error, try copying it, and pasting to a Google search

---

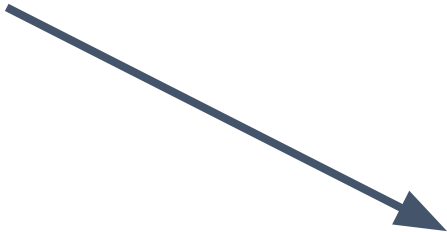
```
In [2]: x + 2|
```

```
-----  
NameError                                Traceback (most recent call last)  
<ipython-input-2-2c7a9192c558> in <module>()  
----> 1 x + 2  
  
NameError: name 'x' is not defined
```

---

Often when you get an error, you will get a long stack trace.

Start looking down here



```
In [34]: df.rename(lambda x: x.upper)

.....
AttributeError                                Traceback (most recent call last)
<ipython-input-34-18dc4f7801aa> in <module>()
----> 1 df.rename(lambda x: x.upper)

~/anaconda3/lib/python3.6/site-packages/pandas/util/_decorators.py in wrapper(*args, **kwargs)
    195     @wraps(func)
    196     def wrapper(*args, **kwargs):
--> 197         return func(*args, **kwargs)
    198
    199     if not PY2:

~/anaconda3/lib/python3.6/site-packages/pandas/core/frame.py in rename(self, *args, **kwargs)
    4023         kwargs.pop('axis', None)
    4024         kwargs.pop('mapper', None)
-> 4025         return super(DataFrame, self).rename(**kwargs)
    4026
    4027     @Substitution(**_shared_doc_kwargs)

~/anaconda3/lib/python3.6/site-packages/pandas/core/generic.py in rename(self, *args, **kwargs)
    1089         level = self.axes[axis].get_level_number(level)
    1090         result._data = result._data.rename_axis(f, axis=baxis, copy=copy,
-> 1091                                                level=level)
    1092         result._clear_item_cache()
    1093

~/anaconda3/lib/python3.6/site-packages/pandas/core/internals/managers.py in rename_axis(self, mapper, axis, copy, level)
    169     """
    170     obj = self.copy(deep=copy)
--> 171     obj.set_axis(axis, _transform_index(self.axes[axis], mapper, level))
    172     return obj
    173

~/anaconda3/lib/python3.6/site-packages/pandas/core/internals/managers.py in _transform_index(index, func, level)
    2002     return MultiIndex.from_tuples(items, names=index.names)
    2003     else:
-> 2004         items = [func(x) for x in index]
    2005         return Index(items, name=index.name, tupleize_cols=False)
    2006

~/anaconda3/lib/python3.6/site-packages/pandas/core/internals/managers.py in <listcomp>(.0)
    2002     return MultiIndex.from_tuples(items, names=index.names)
    2003     else:
-> 2004         items = [func(x) for x in index]
    2005         return Index(items, name=index.name, tupleize_cols=False)
    2006

<ipython-input-34-18dc4f7801aa> in <lambda>(x)
----> 1 df.rename(lambda x: x.upper)

AttributeError: 'int' object has no attribute 'upper'
```



# Stack Overflow

<https://stackoverflow.com/>

- Question is at the top
- Answers underneath
- Pay attention to upvotes and the selected answer

**Example:**

<https://stackoverflow.com/questions/11346283/rename-columns-in-pandas>



# Package API Reference

<http://pandas.pydata.org/pandas-docs/stable/api.html>

- Can be harder to read when you are first learning
- Get into all of the nitty-gritty. You can even view the source code if you want. This can be powerful as your knowledge of Python grows.

## Example:

<https://pandas.pydata.org/pandas-docs/stable/reference/api/pandas.DataFrame.rename.html#pandas.DataFrame.rename>