FREE eBook

LEARNING bokeh

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#bokeh

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About

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Chapter 1: Getting started with bokeh

Remarks

Bokeh is a Python interactive visualization library that targets modern web browsers for presentation. Its goal is to provide elegant, concise construction of novel graphics in the style of D3.js, and to extend this capability with high-performance interactivity over very large or streaming datasets.

Bokeh can help anyone who would like to quickly and easily create interactive plots, dashboards, and data applications.

Examples

Installing Bokeh

Bokeh's Docs on Installation

Bokeh runs on Python it has the following dependencies;

`NumPy, Jinja2, Six, Requests, Tornado >= 4.0, PyYaml, DateUtil`

If you plan on installing with Python 2.7 you will also need `future`.

All of those come with the Anaconda Python Distribution. Which you can download and install for free.

Once you have anaconda installed onto your machine then you can simply run the following in cmd.exe on Windows or terminal on Mac:

```
conda install bokeh
```

If you already have a version of Python then you can run the following in cmd.exe on Windows or terminal on Mac:

```
pip install bokeh
```

Be sure to check out the Bokeh quick start guide for several examples.

Using Bokeh in Jupyter Notebook

Here is a simple example of how to use Bokeh in Jupyter Notebook:

```
import numpy as np
from bokeh.plotting import figure
```

```
# Make Bokeh Push push output to Jupyter Notebook.
from bokeh.io import push_notebook, show, output_notebook
from bokeh.resources import INLINE
output_notebook(resources=INLINE)

# Create some data.
x = np.linspace(0,2*np.pi,20)
y = np.sin(x)

# Create a new plot with a title and axis labels
p = figure(title="Simple Line Plot in Bokeh", x_axis_label='x', y_axis_label='y')

# Add a line renderer with legend and line thickness
p.line(x, y, legend="Value", line_width=3)

# Show the results
show(p)
```

Hello World

To use bokeh you need to launch a bokeh server and connect to it using a browser. We will use this example script (`hello_world.py`):

```
from bokeh.models import ColumnDataSource
from bokeh.plotting import figure
from bokeh.io import curdoc

def modify_doc(doc):
    """Add a plotted function to the document.

    Arguments:
        doc: A bokeh document to which elements can be added.
    """
    x_values = range(10)
    y_values = [x ** 2 for x in x_values]
    data_source = ColumnDataSource(data=dict(x=x_values, y=y_values))
    plot = figure(title="f(x) = x^2",
                  tools="crosshair,pan,reset,save,wheel_zoom",)
    plot.line('x', 'y', source=data_source, line_width=3, line_alpha=0.6)
    doc.add_root(plot)
    doc.title = "Hello World"

def main():
    modify_doc(curdoc())

main()
```

To launch it you need to execute bokeh on the command line and use the `serve` command to launch the server:

```
$ bokeh serve --show hello_world.py
```

The `--show` parameter tells bokeh to open a browser window and show document defined in `hello_world.py`.

Read Getting started with bokeh online: https://riptutorial.com/bokeh/topic/8829/getting-started-with-bokeh

Chapter 2: Deploying Bokeh Code

Introduction

This topic should cover all ways to make a bokeh application available to users.

Examples

Local bokeh server with console entry point

To allow a bokeh application to be executed like a *normal* .py file, you need to handle the tornado IOloop in your application, as described here. A standalone bokeh application like this can be used to implement a console script entry point in `setup.py`. However, this requires bokeh version **>= 0.12.4**.

The bokeh application

Consider the file `local_server.py`:

```
from tornado.ioloop import IOLoop

from bokeh.application.handlers import FunctionHandler
from bokeh.application import Application
from bokeh.models import ColumnDataSource
from bokeh.plotting import figure
from bokeh.server.server import Server


def modify_doc(doc):
    """Add a plotted function to the document.

    Arguments:
        doc: A bokeh document to which elements can be added.
    """
    x_values = range(10)
    y_values = [x ** 2 for x in x_values]
    data_source = ColumnDataSource(data=dict(x=x_values, y=y_values))
    plot = figure(title="f(x) = x^2",
                  tools="crosshair,pan,reset,save,wheel_zoom",)
    plot.line('x', 'y', source=data_source, line_width=3, line_alpha=0.6)
    doc.add_root(plot)
    doc.title = "Test Plot"


def main():
    """Launch the server and connect to it.
    """
    print("Preparing a bokeh application.")
    io_loop = IOLoop.current()
    bokeh_app = Application(FunctionHandler(modify_doc))
    server = Server({"/": bokeh_app}, io_loop=io_loop)
    server.start()
    print("Opening Bokeh application on http://localhost:5006/")

    io_loop.add_callback(server.show, "/")
    io_loop.start()


main()
```

This file can be executed

```
$ python local_server.py
```

which run the server and automatically launch a browser to show the document.

Entry points and the setup.py

In order to provide a script that can be easily installed and called using the setup.py. Consider the following folder structure:

```
project
├── setup.py
└── my_package
    ├── __init__.py
    └── local_server.py
```

Content of `setup.py`:

```
from setuptools import setup

setup(
    name = "my_package",
    entry_points={
        "console_scripts": ["my_script = my_package.local_server:main"],
    },
)
```

When installing the package using

```
$ python setup.py install
```

you can then use the call

```
$ my_script
```

to launch the bokeh application and automatically start a browser displaying the document.

Read Deploying Bokeh Code online: https://riptutorial.com/bokeh/topic/9622/deploying-bokeh-code

Credits

S. No	Chapters	Contributors
1	Getting started with bokeh	Ben Love, Community, James Draper, m00am
2	Deploying Bokeh Code	m00am