05 March Ass

April 23, 2023

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Q1. How can you create a Bokeh plot using Python code?
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Bokeh is a python library which is used for data visualization through␣
 ↪high-performance interactive charts
and plots. It create its plots using HTML . The output of the bokeh library can␣
 ↪be generated on several platfroms
such as browser, HTML , server , and notebook . it is also possible to create␣
 ↪the bokeh plots in Django and flask
applications.
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Q2. What are glyphs in Bokeh, and how can you add them to a Bokeh plot? Explain␣
 ↪with an example.
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Glyphs are bulding blocks of bokeh visualizations. A glyph is a vectorized␣
 ↪graphical shape or marker that
is used to represent your data, They can be a marker- shapes like circle␣
 ↪diamonds squares and triangles
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pip install bokeh
```

```
Requirement already satisfied: bokeh in /opt/conda/lib/python3.10/site-packages
(3.0.3)
Requirement already satisfied: Jinja2>=2.9 in /opt/conda/lib/python3.10/site-
packages (from bokeh) (3.1.2)
Requirement already satisfied: tornado>=5.1 in /opt/conda/lib/python3.10/site-
packages (from bokeh) (6.1)
Requirement already satisfied: xyzservices>=2021.09.1 in
/opt/conda/lib/python3.10/site-packages (from bokeh) (2022.9.0)
Requirement already satisfied: contourpy>=1 in /opt/conda/lib/python3.10/site-
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packages (from bokeh) (1.0.6)
Requirement already satisfied: numpy>=1.11.3 in /opt/conda/lib/python3.10/site-
packages (from bokeh) (1.23.5)
Requirement already satisfied: packaging>=16.8 in
/opt/conda/lib/python3.10/site-packages (from bokeh) (22.0)
Requirement already satisfied: pillow>=7.1.0 in /opt/conda/lib/python3.10/site-
packages (from bokeh) (9.2.0)
Requirement already satisfied: pandas>=1.2 in /opt/conda/lib/python3.10/site-
packages (from bokeh) (1.5.2)
Requirement already satisfied: PyYAML>=3.10 in /opt/conda/lib/python3.10/site-
packages (from bokeh) (6.0)
Requirement already satisfied: MarkupSafe>=2.0 in
/opt/conda/lib/python3.10/site-packages (from Jinja2>=2.9->bokeh) (2.1.1)
Requirement already satisfied: python-dateutil>=2.8.1 in
/opt/conda/lib/python3.10/site-packages (from pandas>=1.2->bokeh) (2.8.2)
Requirement already satisfied: pytz>=2020.1 in /opt/conda/lib/python3.10/site-
packages (from pandas>=1.2->bokeh) (2022.6)
Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.10/site-
packages (from python-dateutil>=2.8.1->pandas>=1.2->bokeh) (1.16.0)
Note: you may need to restart the kernel to use updated packages.
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[1]:
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import bokeh.io
```

[2]:
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import bokeh.plotting
bokeh.io.output_notebook()
```

[3]:
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from bokeh.plotting import figure , output_file , show
from bokeh.sampledata.iris import flowers
```

[4]:
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flowers
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[4]:

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa
..	…	…	…	…	…
145	6.7	3.0	5.2	2.3	virginica
146	6.3	2.5	5.0	1.9	virginica
147	6.5	3.0	5.2	2.0	virginica
148	6.2	3.4	5.4	2.3	virginica
149	5.9	3.0	5.1	1.8	virginica

[150 rows x 5 columns]

[5]:
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output_file('test.html')

p = figure(title = 'test flower')
p.xaxis.axis_label = "petal_length"
p.yaxis.axis_label = "petal_width"
p.circle(flowers['petal_length'] , flowers['petal_width'])
show(p)
```

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Q3. How can you customize the appearance of a Bokeh plot, including the axes,␣
 ↪title, and legend?
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[6]:
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flowers
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[6]:

	sepal_length	sepal_width	petal_length	petal_width	species
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4	5.0	3.6	1.4	0.2	setosa
..	…	…	…	…	…
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148	6.2	3.4	5.4	2.3	virginica
149	5.9	3.0	5.1	1.8	virginica

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[6]:
```
output_file('test.html')

p = figure(title = 'test flower')
p.xaxis.axis_label = "petal_length"
p.yaxis.axis_label = "petal_width"
p.circle(flowers['petal_length'] , flowers['petal_width'] , legend_label =␣
 ↪'This is my flowers data set')
show(p)
```

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Q4. What is a Bokeh server, and how can you use it to create interactive plots␣
 ↪that can be updated in
real time?
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Bokeh serve makes it easy  to crate interactive web applications that connect␣
 ↪front- end UI events
to running python code.
bokeh creates high-level python models,such as plots , ranges, axes , and␣
 ↪glyphs, and then converts these
objects to JSON to pass them to its clients library , bokehjs.
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