INTERACTIVE DATA VISUALIZATION WITH BOKEH

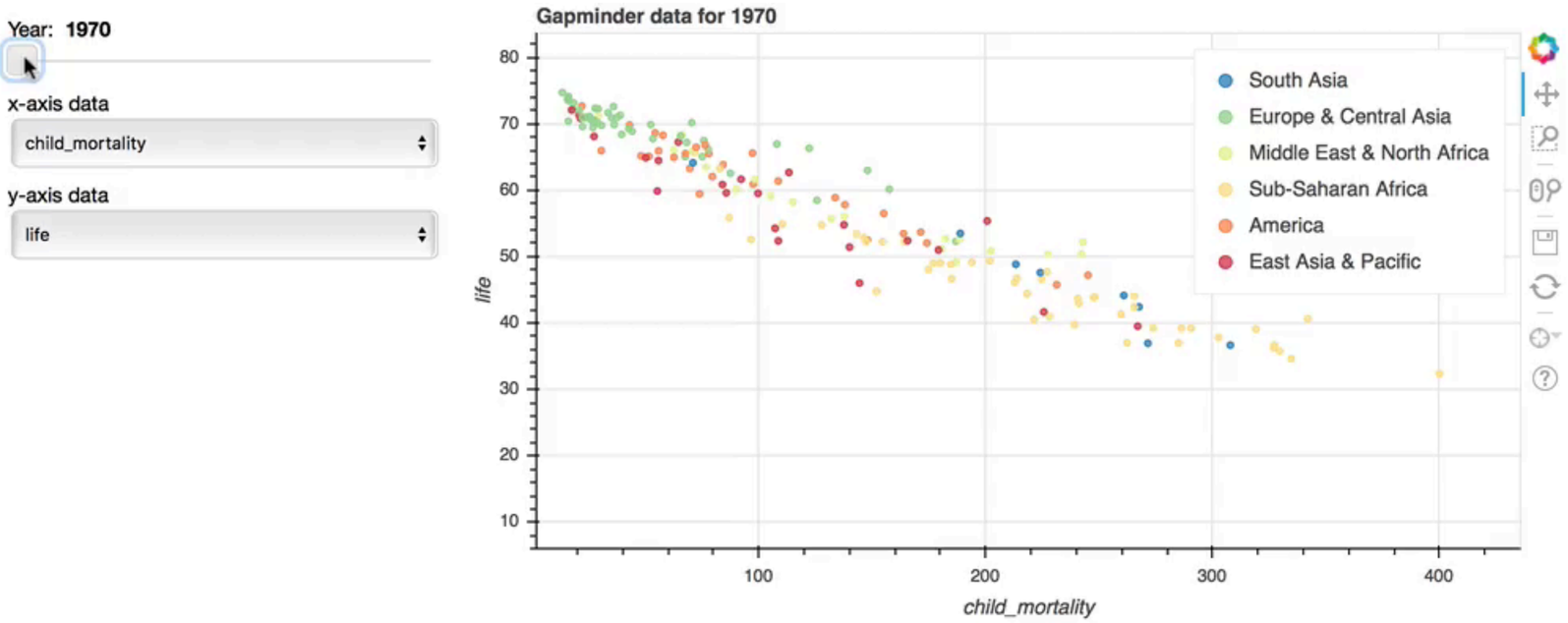
A Case Study

The Gapminder Data Set

```
In [1]: data.head()
Out[1]:
          Country  fertility    life  population  child_mortality     gdp  \
Year
1964  Afghanistan      7.671  33.639  10474903.0            339.7  1182.0
1965  Afghanistan      7.671  34.152  10697983.0            334.1  1182.0
1966  Afghanistan      7.671  34.662  10927724.0            328.7  1168.0
1967  Afghanistan      7.671  35.170  11163656.0            323.3  1173.0
1968  Afghanistan      7.671  35.674  11411022.0            318.1  1187.0

          region
Year
1964  South Asia
1965  South Asia
1966  South Asia
1967  South Asia
1968  South Asia
```

A Data Exploration Tool



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Let’s practice!

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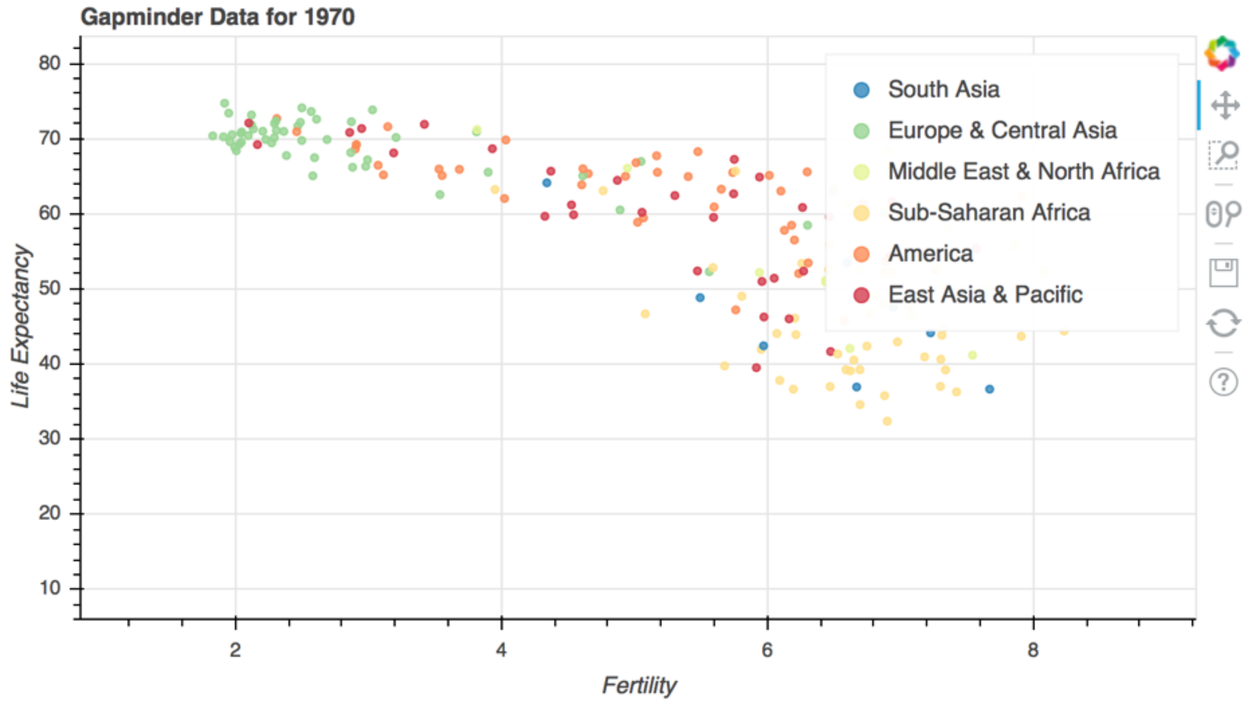
Starting a Basic App

Adding just a plot

```
In [1]: from bokeh.io import curdoc

In [2]: # Create plots and widgets

In [3]: # Add callbacks

In [4]: # Arrange plots and widgets in layouts

In [5]: curdoc().add_root(layout)
```

Adding just a plot



Adding a slider

```
# Define a callback taking attr, old, new
def update_plot(attr, old, new):
    yr = slider.value
    new_data = {
        # Update date here    }
    source.data = new_data

    plot.title.text = # new title text

# Create a slider
slider = Slider(start=1970, end=2010, step=1,
                value=1970, title='Year')

# Add a callback to its value
slider.on_change('value', update_plot)
```

Result for this section

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Adding More Interactivity

Adding a Hover Tool

hover.py

```
from bokeh.models import HoverTool

# HoverTool tooltips accepts a list of tuples
hover = HoverTool(tooltips=[
    ('species name', '@species'),
    ('petal length', '@petal_length'),
    ('sepal length', '@sepal_length'),
])

# Include hover in the list of plot tools
plot = figure(tools=[hover, 'pan', 'wheel_zoom'])
```

Adding a Dropdown Menu

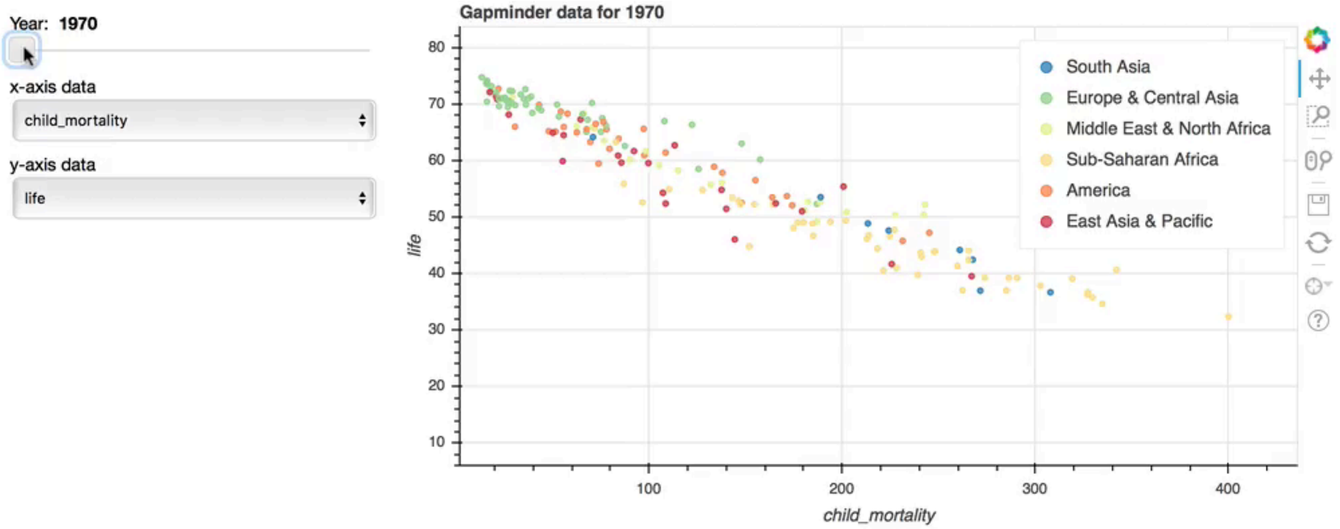
```
from bokeh.models import Select

# Define a callback taking attr, old, new
def callback(attr, old, new):
    # Update the plot here

# Create a Select widget
menu = Select(options=['foo', 'bar', 'baz'],
              value='foo', title='A menu of options')

# Add a callback to its value
menu.on_change('value', callback)
```

The final result



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Wrap Up

Recap and Next Steps

- The bokeh.plotting interface for basic plotting
- How to customize plots and add layouts and interactions
- The bokeh.charts interface for very high level charts
- The power of the bokeh server for creating richly interactive visualization applications.

https://bokeh.github.io

Congratulations!