Introduction to Bokeh

INTERACTIVE DATA VISUALIZATION WITH BOKEH

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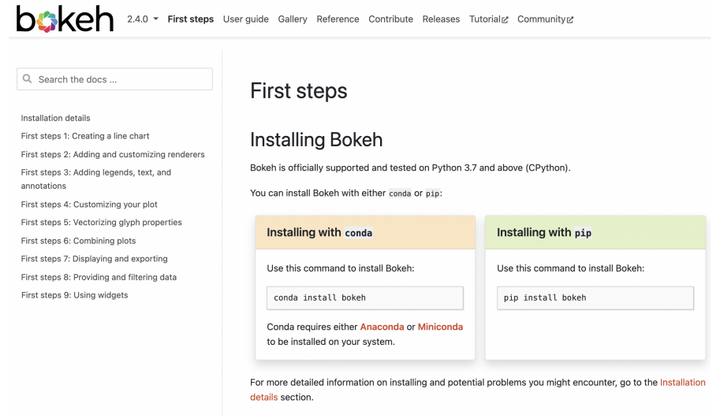
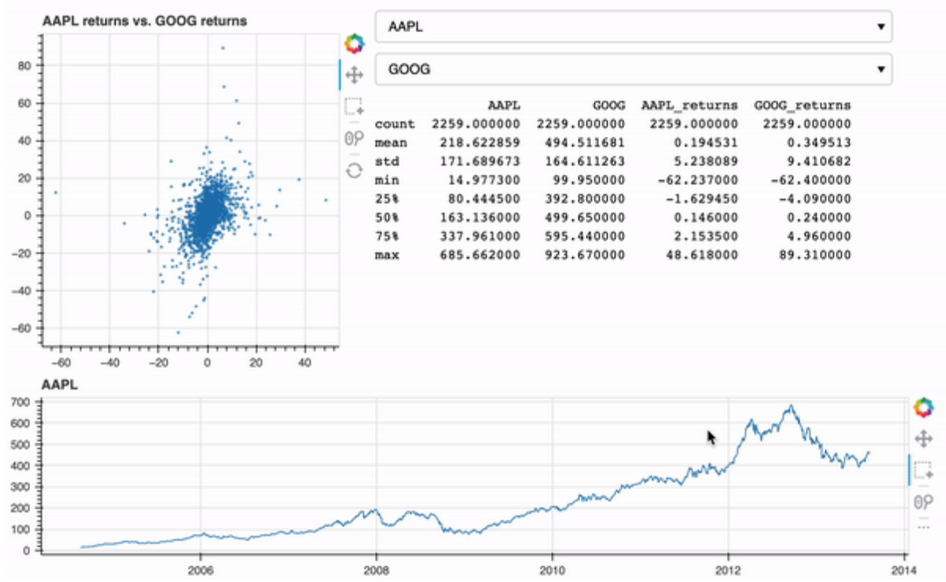
datacamp

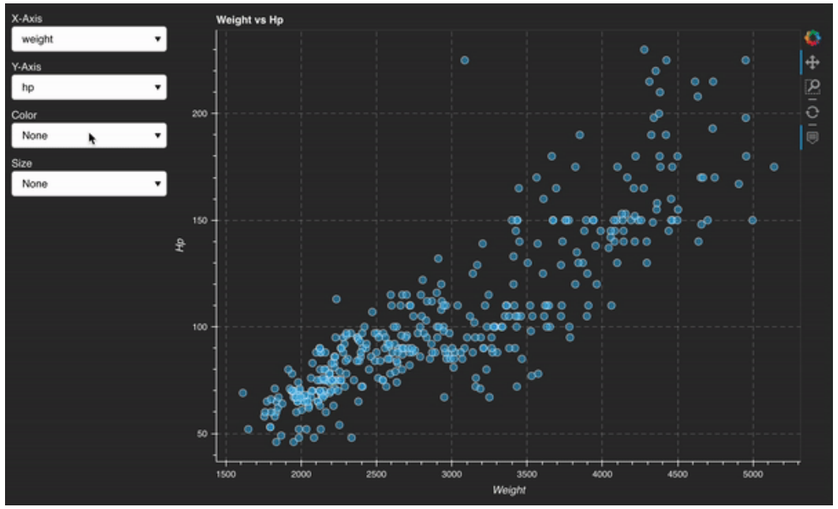
What is Bokeh?

- **Documentation**



- **Gallery**





Course overview

- Chapter 1: Introduction to Bokeh
- Chapter 2: Customizing visualizations
- Chapter 3: Storytelling with visualizations
- Chapter 4: Introduction to widgets

```
import pandas as pd
nba = pd.read_csv("nba.csv")
print(nba.columns)
```

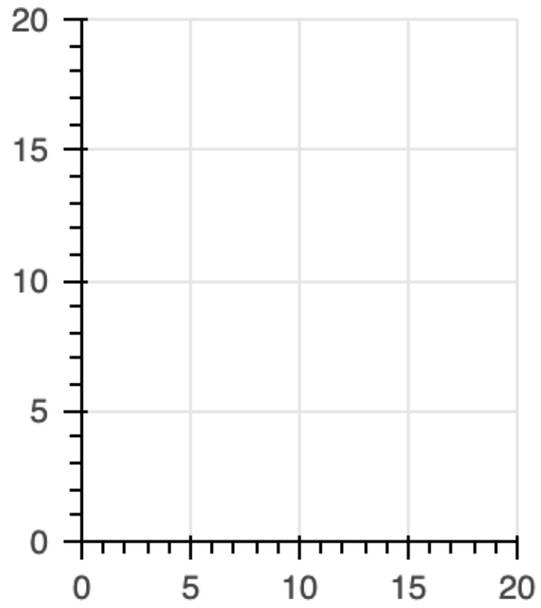
```
Index(['player', 'position', 'minutes', 'field_goal_perc', 'three_point_perc',
       'free_throw_perc', 'rebounds', 'assists', 'steals', 'blocks', 'points',
       'team', 'conference', 'scorer_category'],
      dtype='object')
```

```
print(nba.shape)
```

```
(424, 14)
```

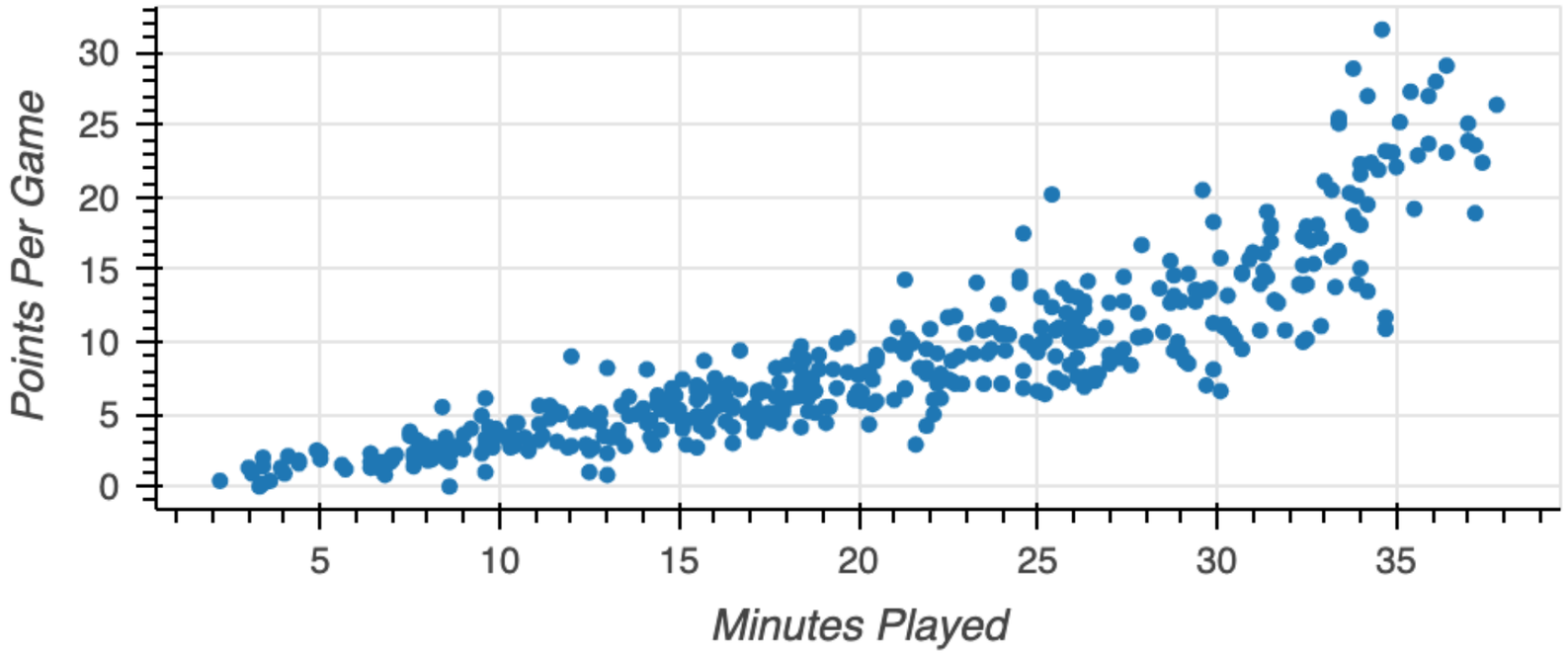
Setting up a figure

```
from bokeh.plotting import figure
from bokeh.io import output_file, show
fig = figure()
output_file(filename="empty_figure.html")
show(fig)
```



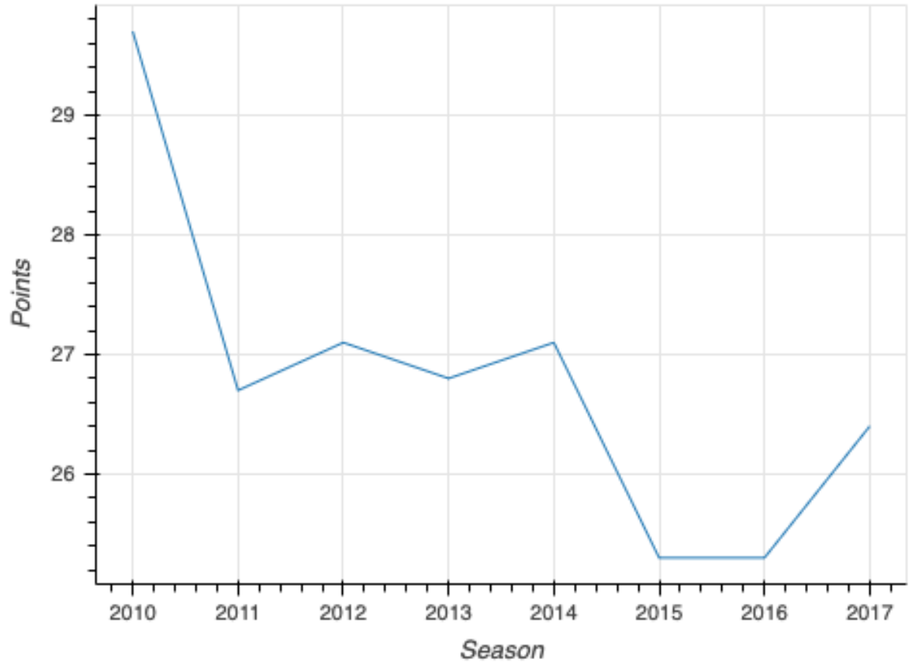
Building a scatter plot

```
fig = figure(x_axis_label="Minutes Played", y_axis_label="Points Per Game")
fig.circle(x=nba["minutes"], y=nba["points"])
output_file(filename="nba_points.html")
show(fig)
```



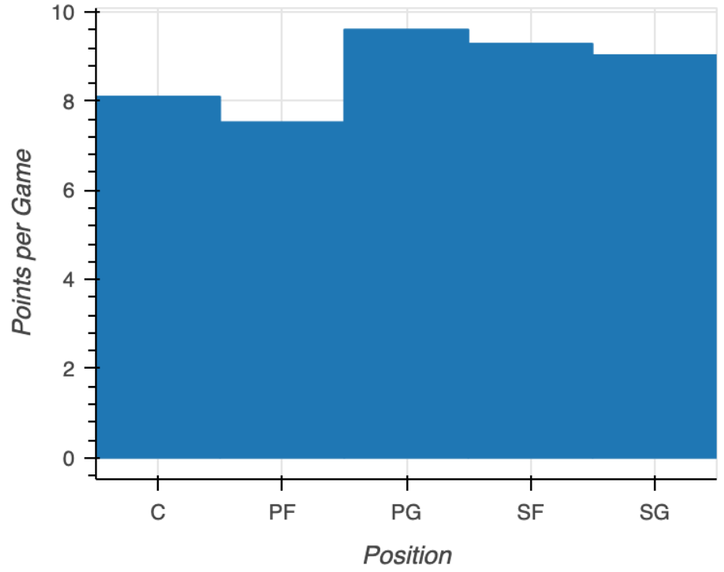
Displaying a line plot

```
fig = figure(x_axis_label="Season", y_axis_label="Points")
fig.line(x=lebron["season"], y=lebron["points"])
output_file(filename="lebron_points_per_season.html")
show(fig)
```



Plotting categorical data

```
positions = nba.groupby("position", as_index=False)["points"].mean()
fig = figure(x_axis_label="Position", y_axis_label="Points per Game",
             x_range=positions["position"])
fig.vbar(x=positions["position"], top=positions["points"])
output_file(filename="nba_points_by_position.html")
show(fig)
```



Let's practice!

INTERACTIVE DATA VISUALIZATION WITH BOKEH

Configuration tools

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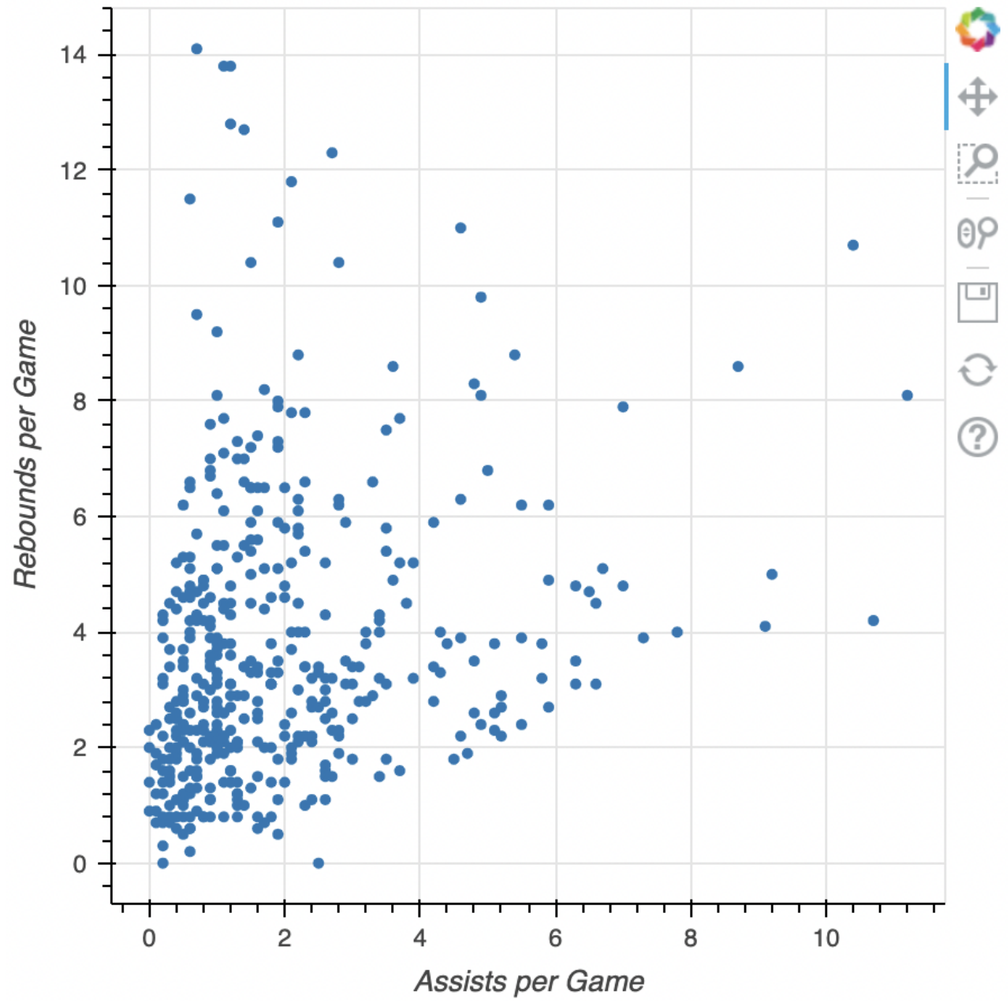
The default toolbar

- PanTool
  - `pan`
- BoxZoomTool
  - `box_zoom`
- WheelZoomTool
  - `wheel_zoom`
- Save
  - `save`
- Reset
  - `reset`



Configuration tools

We will cover:

- Pan/Drag tools
- Click/Tap tools
- Scroll/Pinch tools

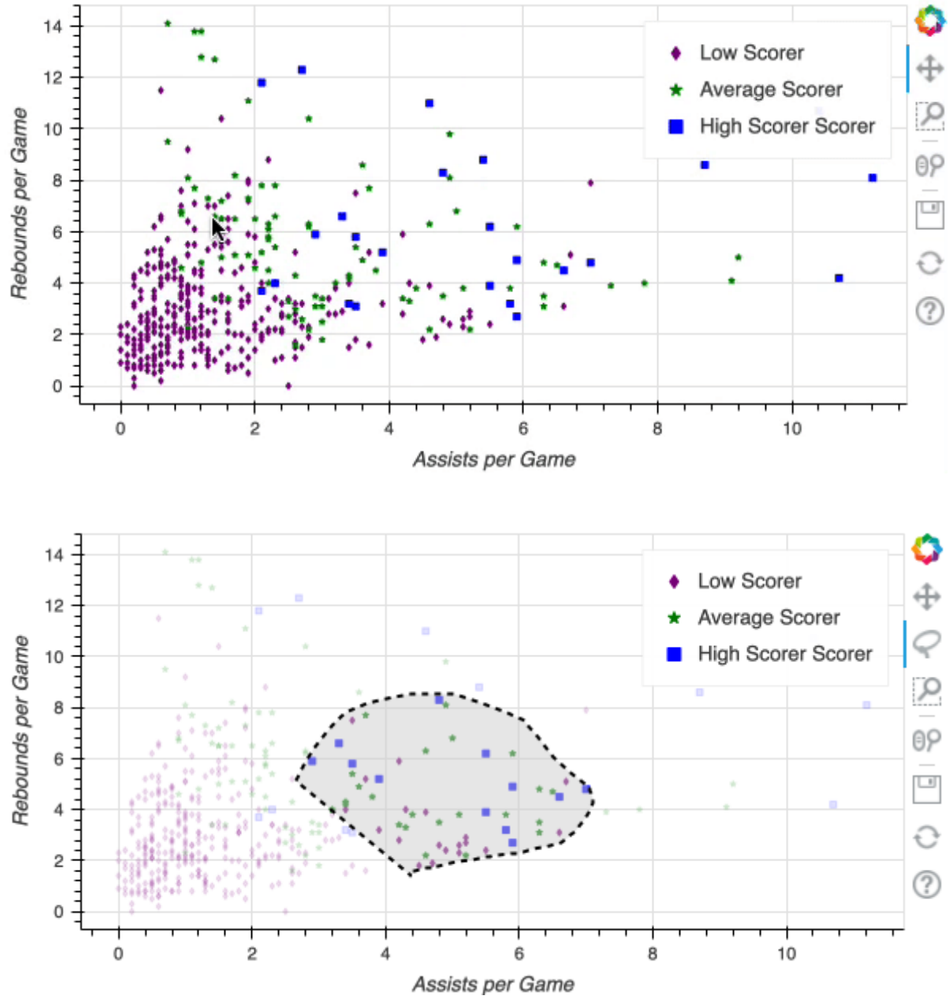
Other tools outside of course scope:

- Actions
- Inspectors
- Edit tools

[1] http://docs.bokeh.org/en/latest/docs/user_guide/tools.html

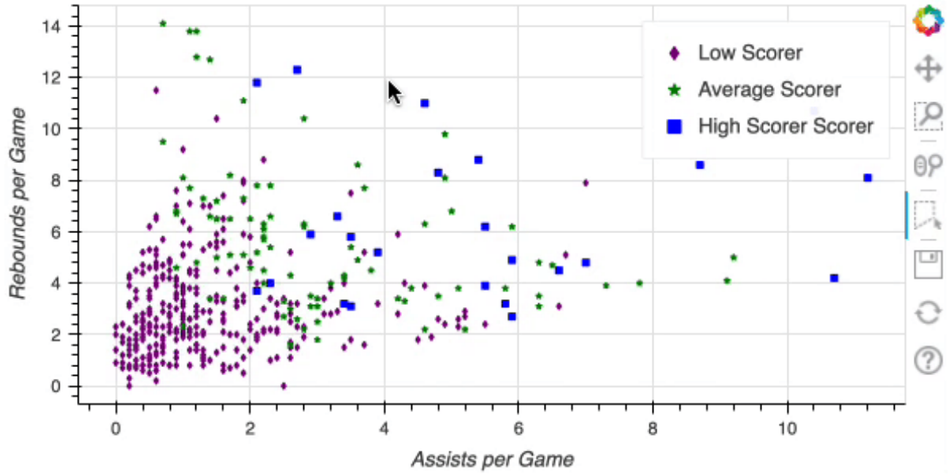
Pan/drag tools

- PanTool
  - `pan`
- BoxSelectTool
  - `box_select`
- BoxZoomTool
  - `box_zoom`
- LassoSelectTool
  - `lasso_select`

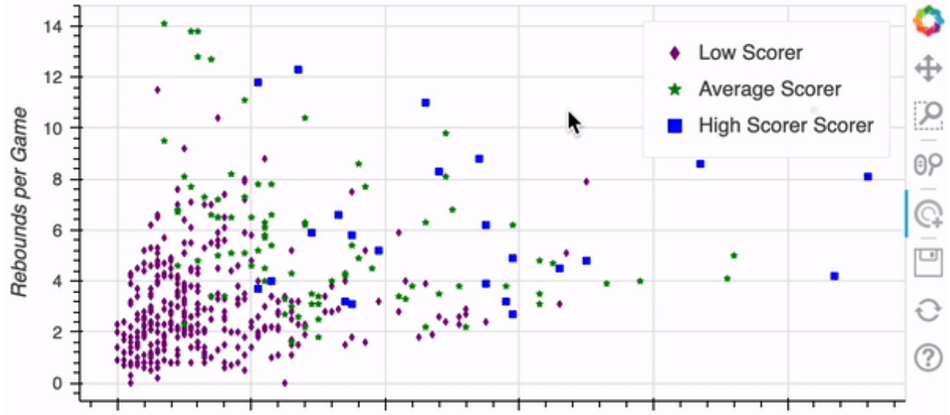


Click/tap tools

- PolySelectTool
  - `poly_select`

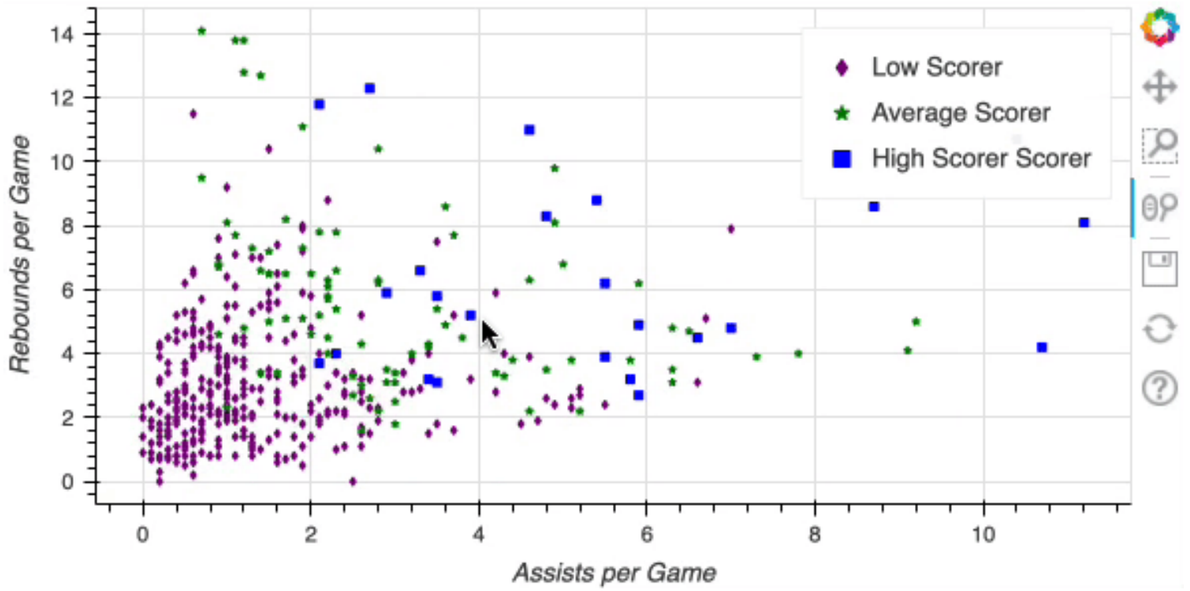


- TapTool
  - `tap`



Scroll/pinch tools

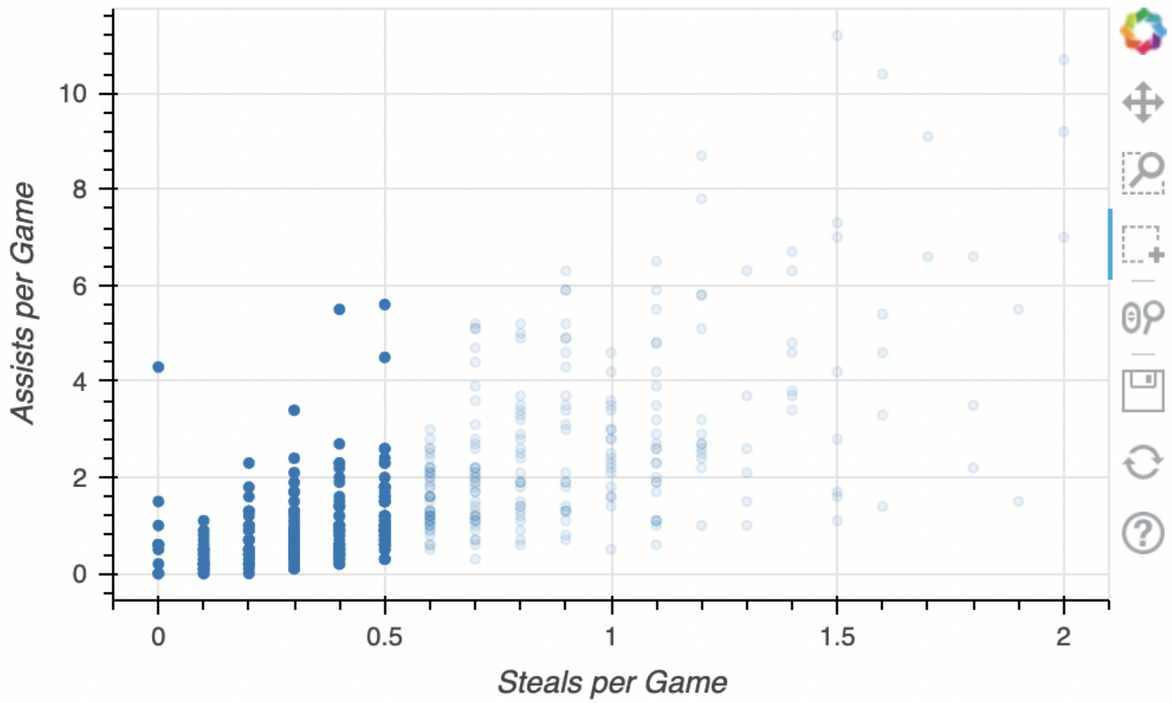
- WheelZoomTool
  - `wheel_zoom`



- WheelPanTool
  - `xwheel_pan`
  - `ywheel_pan`

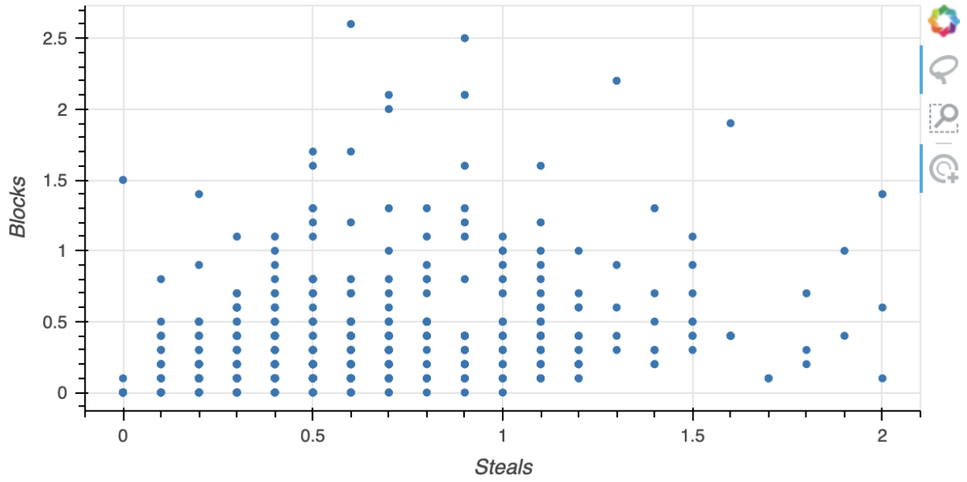
Customizing the toolbar

```
from bokeh.models import BoxSelectTool
fig = figure(x_axis_label="Steals per Game",
             y_axis_label="Assists per Game")
fig.circle(x=nba["steals"], y=nba["assists"])
fig.add_tools(BoxSelectTool())
output_file(filename="adding_box_select.html")
show(fig)
```



Custom list of tools

```
tools = ["lasso_select", "box_zoom", "tap"]
fig = figure(x_axis_label="Steals", y_axis_label="Assists",
             tools=tools)
fig.circle(x=nba["steals"], y=nba["assists"])
output_file(filename="custom_tools.html")
show(fig)
```



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Adding LassoSelectTool

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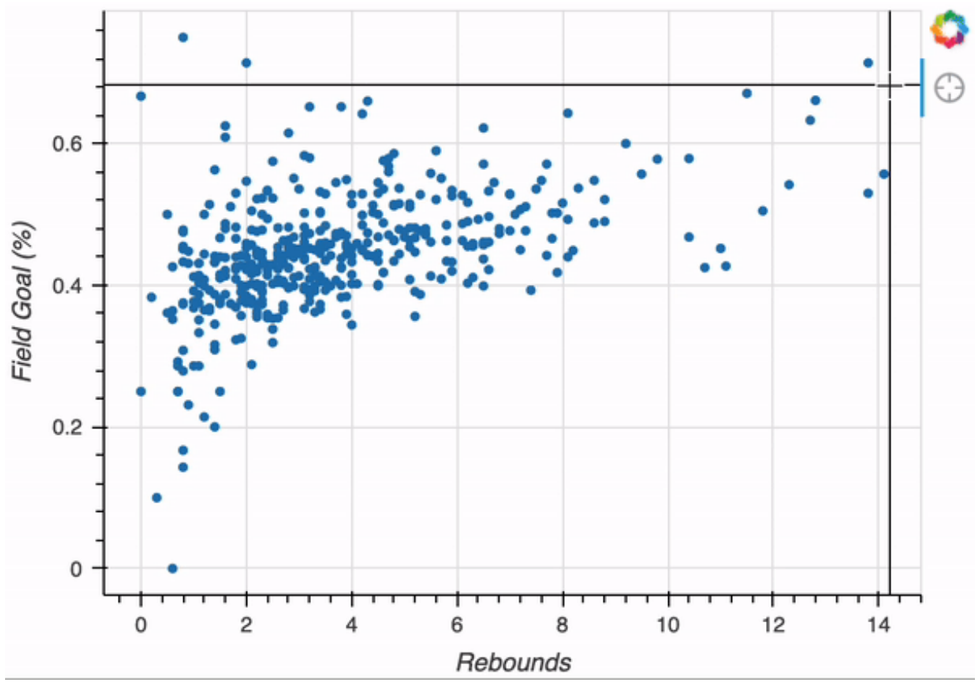
Inspectors

- CrosshairTool
  - `crosshair`

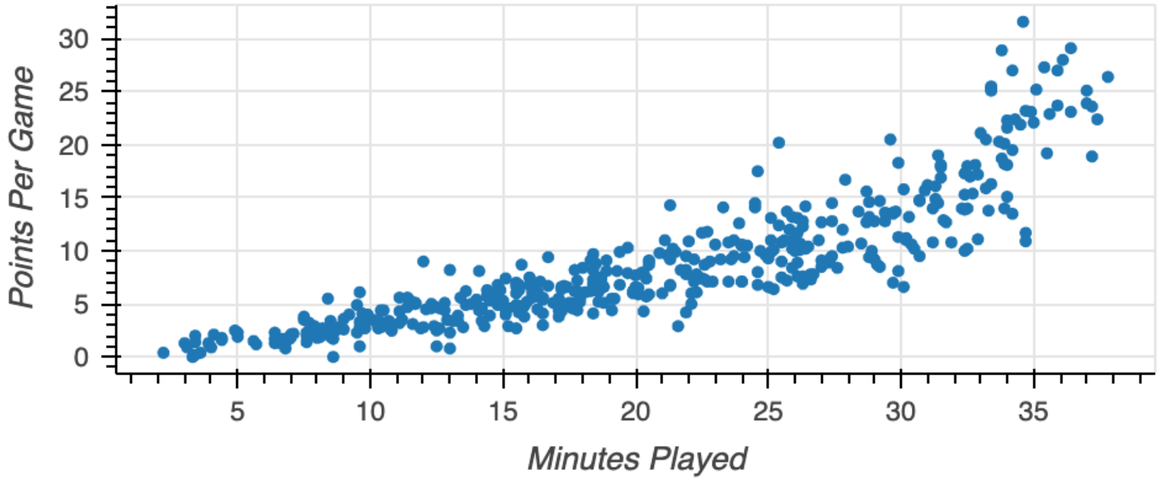


- HoverTool
  - `hover`

[1] https://docs.bokeh.org/en/latest/docs/user_guide/tools.html#userguide-tools-inspectors

Bokeh data source objects

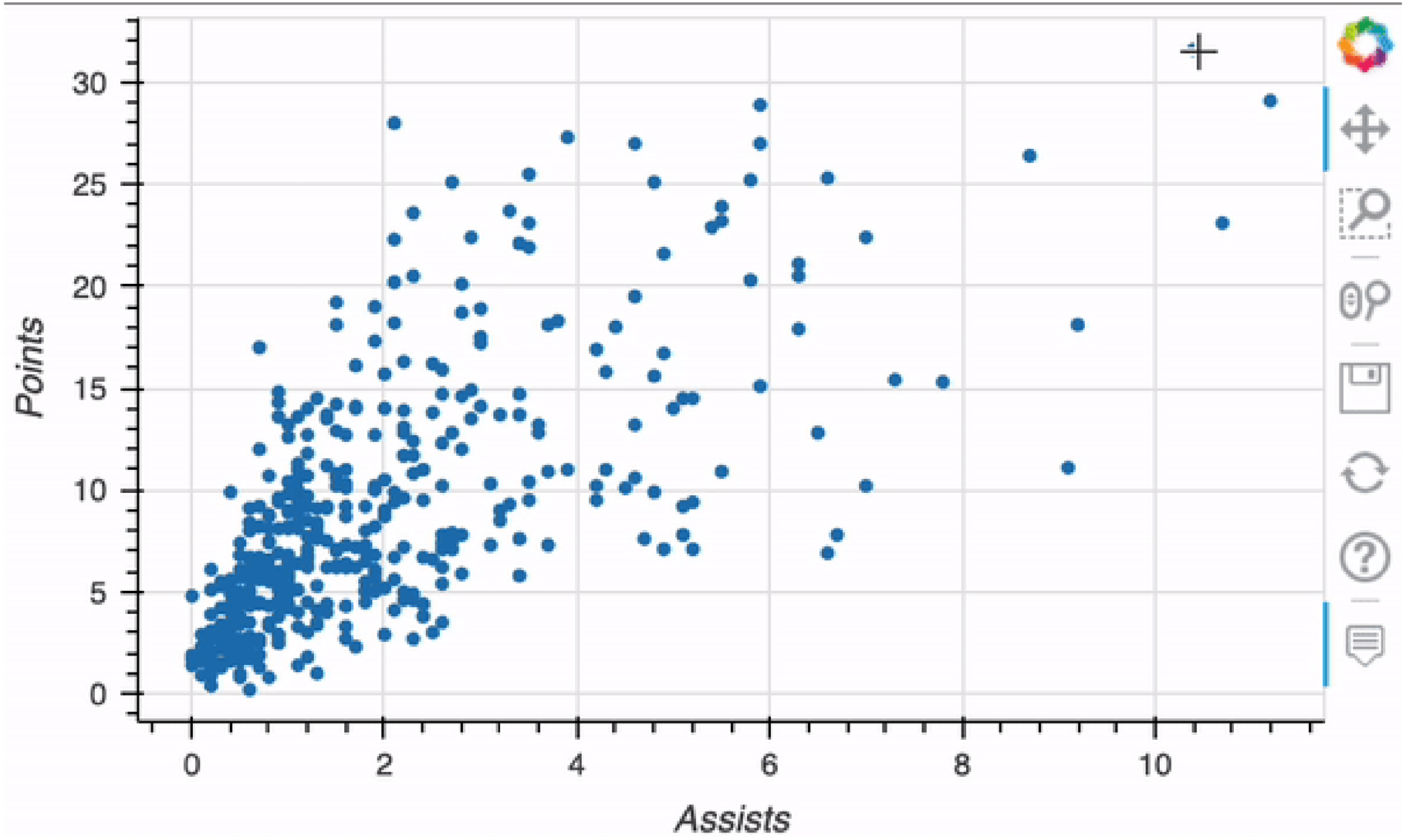
```
from bokeh.models import ColumnDataSource
source = ColumnDataSource(data=nba)
fig = figure(x_axis_label="Minutes Played", y_axis_label="Points Per Game")
fig.circle(x="assists", y="points", source=source)
output_file(filename="ColumnDataSource.html")
show(fig)
```



Setting up the HoverTool

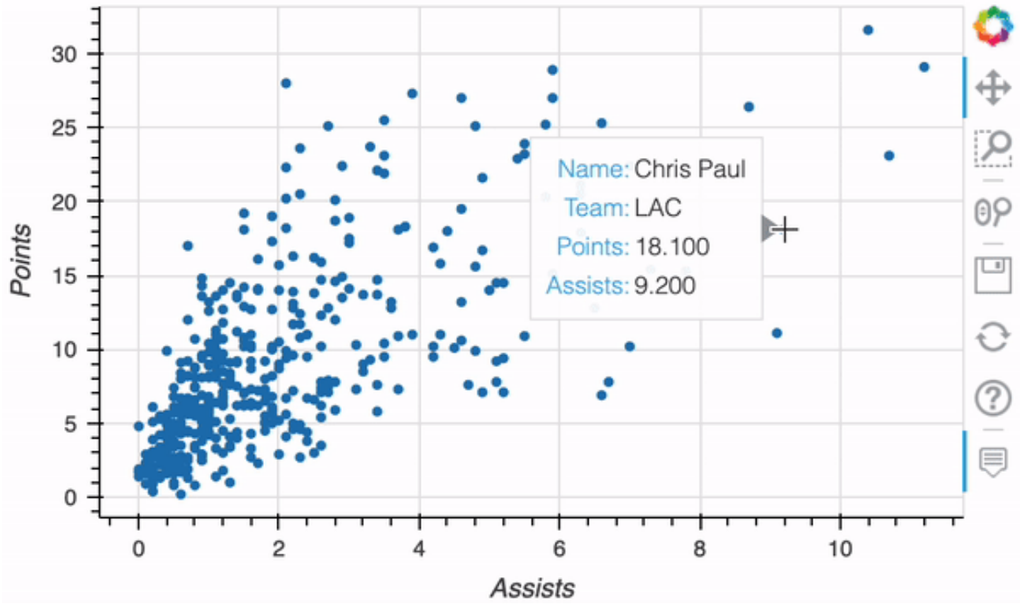
```
from bokeh.models import ColumnDataSource
source = ColumnDataSource(data=nba)
TOOLTIPS = [("Name", "@player"), ("Team", "@team")]
fig = figure(x_axis_label="Assists", y_axis_label="Points",
             tooltips=TOOLTIPS)
fig.circle(x="assists", y="points", source=source)
output_file("name_and_team.html")
show(fig)
```

HoverTool in action



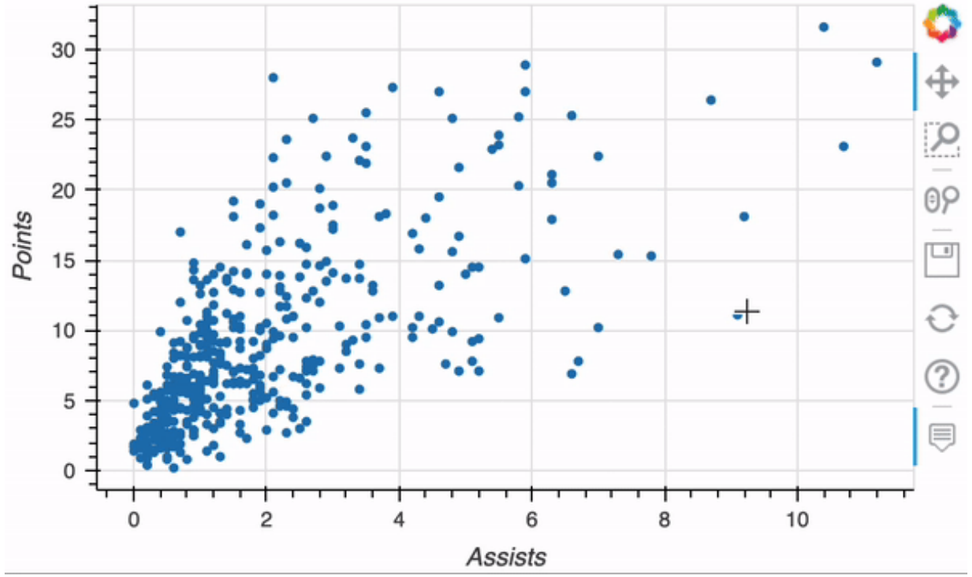
Displaying numeric data

```
TOOLTIPS = [("Name", "@player"), ("Team", "@team"),
            ("Points", "@points"), ("Assists", "@assists")]
fig = figure(x_axis_label="Assists", y_axis_label="Points", tooltips=TOOLTIPS)
fig.circle(x="assists", y="points", source=source)
output_file("hovertool.html")
show(fig)
```



Formatting the HoverTool

```
TOOLTIPS = [("Name", "@player"), ("Team", "@team"),
            ("Points", "@points{0.2f}"), ("Assists", "@assists{0.2f}")]
fig = figure(x_axis_label="Assists", y_axis_label="Points", tooltips=TOOLTIPS)
fig.circle(x="assists", y="points", source=source)
output_file("formatted_hovertool.html")
show(fig)
```



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