Bootcamp Info Sheet

Instructor

Name: *Joy Hopkins*

Bio: *Joy Hopkins (she/they) has more than 15 years experience in education. After an extensive career in the nonprofit sector, they transitioned to tech about 9 years ago. Joy has a deep background in the performing arts which is the foundation for both their communication and project management skills. Their data science expertise and passion lie primarily in data literacy, visualization, and storytelling. Joy has a Bachelor's degree from James Madison University and a Master's degree from American University.*

Image:

Bootcamp Details

Bootcamp Title: *Data Visualization with Python*

Number of Days: *4*

Hours per Day: *3*

Type of Instruction: *Lecture with interactive knowledge checks and coding exercises*

Description: *Creating visualizations is a critical means of exploring data and revealing insights. In this course, learners will use a widely regarded Python package, matplotlib, to prepare data for exploratory analysis and create basic, static visualizations. Learners will generate bar charts, scatter plots, histograms, and other common visualizations to better understand the shape, structure, and features of a sample dataset. Learners will discuss the advantages of adding additional layers of data to a visualization through dynamic elements. Learners will then learn how to connect Plotly to the data transformation library Pandas using Cufflinks. Finally, learners will generate interactive bar charts, box*

plots, scatter plots, and other commonly used formats. In this course, learners will discuss the advantages of interactive visualizations using Bokeh library.

Target Audience: *Learners who are moderately proficient at wrangling data and performing basic data cleaning operations in Python.*

Technologies:

#Python 3.11.4
matplotlib==3.7.1
numpy==1.24.3
pandas==2.0.2
seaborn==0.12.2
statsmodels==0.14.4
plotly==5.14.1
bokeh==3.6.3
ipywidgets==8.0.6
Jinja2==3.1.2
nbformat==5.10.4

Prerequisites: *Learners should be moderately proficient at wrangling data and performing basic data cleaning operations in Python.*

Student References: *Class slides, exercises and exercises with answers, class code.*

Bootcamp Syllabus

Outline – Add or delete days/topics as needed.

Day 1

- Introduction to Data visualization and Exploratory Data Analysis
    - Discuss data visualization and exploratory data analysis
    - Describe chart types by data and form

- Static plots
    - Prepare data for visualization
    - Create histograms, boxplots, and bar charts
    - Define bivariate plots and create scatterplots
    - Construct customized graphs

Day 2

- Static plots
    - Create violin plots
    - Create compound visualizations

- Interactive visualizations with Bokeh

- Introduce Bokeh package for interactive visualizations
- Generate your first figure using Bokeh and add glyphs to it
- Transform and prepare data for maps
- Create simple plots using Bokeh

Day 3

- Interactive visualizations with Bokeh
  - Organize multiple visualization with layouts and configure plot tools
  - Add interactivity and highlight data using labels
  - Integrate widgets to bokeh and plotly graphs

- Interactive visualizations with Plotly
  - Introduce Seaborn plotting library and describe univariate plots in Seaborn
  - Describe bivariate plots and heatmaps and format plots in Seaborn

Day 4

- Interactive visualizations with Plotly
  - Define Plotly Express
  - Describe univariate plots in Plotly Express
  - Describe bivariate plots and multivariate plots in Plotly
  - Build heatmaps and geographic maps using plotly