WOMEN WHO CODE PYTHON

✨Python Libraries 101✨
Session 7

Hi, we are

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WOMEN WHO CODE PYTHON

Our Mission

Inspiring women to excel in technology careers.

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Our Vision

A world where diverse women are better represented as engineers and tech leaders

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Our Target

Engineers with two or more years of experience looking for support and resources to strengthen their influence and levelup in their careers.

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Code of Conduct

WWCode is an inclusive community, dedicated to providing an empowering experience for everyone who participates in or supports our community, regardless of gender, gender identity and expression, sexual orientation, ability, physical appearance, body size, race, ethnicity, age, religion, socioeconomic status, caste, creed, political affiliation, or preferred programming language(s).

Our events are intended to inspire women to excel in technology careers, and anyone who is there for this purpose is welcome. We do not tolerate harassment of members in any form. Our Code of Conduct applies to all WWCode events and online communities.

Read the full version and access our incident report form at
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Karen Wong

Programmer at R&D Company
Lead at Women Who Code Python

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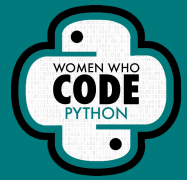
Today's Agenda

1. What is Data Visualization?
2. Matplotlib
   a. Introduction to Matplotlib
   b. Matplotlib Functions
3. Seaborn
   a. Introduction to Seaborn
   b. Seaborn Functions
4. Plotly
   a. Introduction to Plotly
   b. Plotly Functions
5. QnA
6. Let's Code!



Data Visualization

What is Data Visualization?

- Data visualization is the representation of data or information in a graph, chart, or other visual format.
- It communicates relationships of the data with images.

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Matplotlib

What is Matplotlib?

- Matplotlib is a comprehensive library for creating static, animated, and interactive visualizations in Python.
- Matplotlib is the most popular Python plotting library.
- *Installation:*

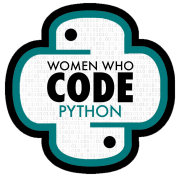
  pip install matplotlib

What is Pyplot?

- The most used module of Matplotlib is Pyplot, its plotting framework.
- Each pyplot function can be used to modify the figure,

  For example; creates a figure, creates a plotting area within figure, plots lines in the plotting area, and decorates the plot with labels.

  import matplotlib.pyplot as plt



Pyplot Functions

- **plt.scatter(x,y)**
  - Creates a scatter plot; uses dots to represent values
  - Used to observe relationship between variables
- **plt.plot(x,y)**
  - Creates a line graph
- **plt.hist(x[n,], intervals)**
  - Creates a histogram
  - X[n,] can be a single array or a sequence of arrays (can be of diff lengths)

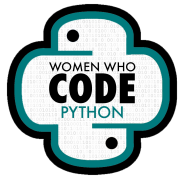
Pyplot Functions

- **plt.bar(categorical_variables, values, color)**
  - Creates a bar graph
- **plt.pie(x,explode,labels,colors,autopct)**
  - Creates a pie chart
- **plt.show()**
  - Displays the graph.
  - Required if the script is run in the terminal/IDEs.
  - Isn’t required for notebooks such as Jupyter or Colab

Seaborn

What is Seaborn?

- Seaborn is a Python data visualization library built on matplotlib.
- Matplotlib is mainly used for basic plotting and generally consists of bars, pies, lines, scatter plots and so on.
- Seaborn, on the other hand, provides a variety of visualization patterns. It uses fewer syntax and has easily interesting default themes.



Seaborn

pip install seaborn
import seaborn as sns

- **sns.scatterplot(x,y)**
- **sns.heatmap()**
  - a graphical representation of data using colors to visualize the value of the matrix

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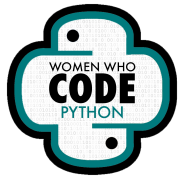
Plotly

What is Plotly?

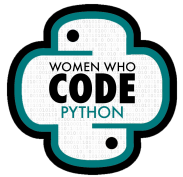
- Plotly provides online graphing, analytics, and statistics tools for individuals and collaboration
- Plotly is an open-source data visualization library for Python and R written in JavaScript, making graphs inherently interactive.
- Plotly, is a more sophisticated data visualization tool that is better suited for creating elaborate plots more efficiently.

pip install plotly



Graphs with Plotly

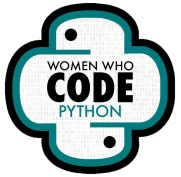
- **plotly.express for simple, quick plots (imported as px)**
  - Specify a DataFrame and its columns as arguments.
  - Quick and nice but less customization
- **plotly.graph_objects (imported as go) for customization**
  - go.X methods like go.Bar() and go.Scatter() allow many more customization options
  - Requires more code
- **With plotly.figure_factory for specific, advanced figures.**



Graphs with Plotly

- **px.scatter(), px.line(), px.bar()**
- **px.funnel() -** each row of the DataFrame is represented as a stage of the funnel
- **px.area() -** creates a stacked area plot

- **Basics**: scatter, line, area, bar, funnel, timeline
- **Part-of-Whole**: pie, sunburst, treemap, icicle, funnel_area
- **1D Distributions**: histogram, box, violin, strip, ecdf
- **2D Distributions**: density_heatmap, density_contour
- **Matrix or Image Input**: imshow
- **3-Dimensional**: scatter_3d, line_3d
- **Multidimensional**: scatter_matrix, parallel_coordinates, parallel_categories
- **Tile Maps**: scatter_mapbox, line_mapbox, choropleth_mapbox, density_mapbox
- **Outline Maps**: scatter_geo, line_geo, choropleth
- **Polar Charts**: scatter_polar, line_polar, bar_polar
- **Ternary Charts**: scatter_ternary, line_ternary



QnA Time!

Let's Code!

References

- https://towardsdatascience.com/14-data-visualization-plots-of-seaborn-14a7bdd16cd7
- https://medium.com/swlh/plotly-beautiful-data-visualization-made-easy-3f7e48864706
- https://plotly.com/python/basic-charts/
- https://dphi.tech/community/
- Our Github Repo: https://github.com/WomenWhoCode/WWCodePython/tree/master/Python%20Libraries%20Series

Upcoming Events

SAT 02 OCT	Python Libraries 101 *Featured, Recurring* Online | Python | 7:30 PM - 8:30 PM IST (UTC+0530)	Register
FRI 08 OCT	LeetCode Series Study Group *Featured, Recurring* Online | Python | 5:30 AM - 7:00 AM IST (UTC+0530)	Register
SAT 09 OCT	Python Libraries 101 *Featured, Recurring* Online | Python | 7:30 PM - 8:30 PM IST (UTC+0530)	Register

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Thank you!

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