S.No. : 426 NITBC4101

No. of Printed Pages : 04

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 44002 Roll No.

B. Tech Examination 2024-25

(Odd Semester)

DATA VISUALIZATION WITH PYTHON

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION–A

1. Attempt all parts of the following : $1 \times 8 = 8$

   (a) How to calculate factorial in python?

   (b) What is matplotlib used for?

   (c) How to create a bubble chart in python?

   (d) What s central tendency?

   (e) How to create subplots in python?

   (f) What does Seaborn's implot do?

[P. T. O.

(g) What is a choropleth map?

(h) How to create a heatmap in seaborn?

SECTION – B

2. Attempt any two parts of the following : $6 \times 2 = 12$

(a) What is the significance of loops in python? Write a script demonstrating loops with a practical example.

(b) Describe how to create and customize different types of plots in matplotlib(e. g., line, bar, scatter). Provide examples.

(c) What are the advantages of using folium for geospatial data visualization? Provide an example of creating a map with markers.

(d) Describe the different type of relational plots available in seaborn. When should each type be used?

SECTION – C

Note:- Attempt *any two parts of the following. Each part carry equal marks.* $8 \times 5 = 40$

3. (a) Explain the concept of data visualization. How does matplotlib's architecture support it?

(b) Discuss the role of central tendency and dispersion in data analysis. How can they be calculated in python.

(c) Explain probability concepts like normal distribution and the central limit theorem with examples.

4. (a) How do polar charts and contour plots enhance data visualization?Explain with examples in matplotlib.

(b) Discuss how to create multiple subplots in matplotlib, including adding a main title and disabling individual subplot axes.

(c) Explain the use of color maps and legends in matplotlib. How can they be added to visualize a 2D array?

5. (a) Explain how to create choropleth maps with folium? What are the key steps involved?

(b) Discuss the process of exporting geospatial visualizations to PNG or PDF formats using python.

(c) How can interactive features like tooltips and popups enhance map visualizations in folium? Provide examples.

6. (a) How can seaborn's matrix polts, such as heatmaps and cluster maps, be used to analyze data? Provide examples?

(b) Discuss the role of style and color themes in seaborn. How can they be customized for better visualzation?

(c) Explain the concept of regression plot in seaborn. Provide examples of customizing the plot with additional parameters like hue and markers.

⌘⌘⌘