M.M. INSTITUTE OF COMPUTER TECHNOLOGY & BUSINESS MANAGEMENT
MAHARISHI MARKANDESHWAR (DEEMED TO BE UNIVERSITY)
MULLANA–AMBALA, HARYANA (INDIA) - 133207

(Established under Section 3 of the UGC Act, 1956)

(Accredited by NAAC with Grade 'A++')

Session: 2025-26
Paper Code: BCA-609

Class/Semester/Section: BCA 6th DS
Paper: Data Visualization Lab

Course Objective: Able to recall fundamental concepts and historical milestones in data visualization. Apply time-series visualization techniques in real-world contexts, such as financial analysis, economic forecasting, or environmental monitoring. Analyze time-series data to draw meaningful insights and identify trends, seasonality, and anomalies. Evaluate different security solutions and tools available for securing Data visualizations, for different scenarios.

Course Outcome:

1. Understand basic data visualization techniques to real-world datasets.
2. Apply design principles such as color theory, layout, and typography to enhance the effectiveness of visualizations.
3. Analyze and interpret time-series visualizations to draw meaningful insights.
4. Analyze data visualizations to identify potential security vulnerabilities.
5. Evaluate the effectiveness of security measures in data visualizations.

Listing of Practical Experiments

Section	Sr. No.	Experiment	CO	PO
A	1.	Create a simple bar chart using student marks or sales data and explain what it shows.	CO1	PO1
	2.	Draw a line chart to represent time-based data (e.g., monthly attendance or sales).	CO2	PO1
	3.	Perform data representation vs data presentation for the same dataset using at least two different chart types.	CO2	PO1
	4.	Identify the purpose of data visualization for a given dataset and use a donut chart.	CO2	PO3
	5.	Explain the seven stages of data visualization using a simple example.	CO2	PO5
	6.	Create one basic visualization using any data visualization tool (Excel / Google Sheets / Tableau / Power BI).	CO5	PO2
B	7.	Create an area chart for time-series data such as yearly profit or rainfall data.	CO4	PO3
	8.	Draw a scatter plot to show the relationship between two variables (e.g., study hours vs marks).	CO3	PO3
	9.	Create a pivot table and a pivot chart using a simple dataset.	CO3	PO3
	10.	Design a tree map to represent category-wise data (e.g., department-wise student count).	CO3	PO3
	11.	Draw a simple node-link diagram to show relationships (e.g., friends in a class).	CO2	PO5
	12.	Visualize the correlation between different numeric variables in a dataset using a color-coded matrix (heatmap).	CO4	PO3
C	13.	Create a time-series visualization with multiple variables and analyze the observed patterns.	CO3	PO3
	14.	Perform text visualization by counting word frequency from a paragraph and plotting it.	CO3	PO3
	15.	Create a simple multivariate chart using more than two variables (e.g., marks in three subjects).	CO3	PO3
	16.	Study a small case example where visualization helps in understanding data easily.	CO3	PO4
	17.	Create a live-like data visualization using continuously updated values (manual update is allowed).	CO3	PO3
	18.	Write basic rules or best practices for creating good visualizations with examples.	CO2	PO3
D	19.	Create a basic chart to show open and closed ports from given data.	CO3	PO3
	20	Create a firewall log visualization to identify suspicious traffic patterns.	CO4	PO4
	21.	Design an intrusion detection log visualization and highlight possible attacks.	CO4	PO3
	22.	Write a program to implement sentiment analysis on the live tweet data using Python libraries.	CO3	PO5
	23.	Write a program to create interactive visualizations to monitor device activity for Pre-processed simulated IoT data streams in real-time.	CO2	PO3
	24.	Design a secured data visualization system architecture and explain the security measures used.	CO3	PO5

Teaching and Examination Scheme

Teaching Hours	Credits	Examinational Marks			Internal Break-up					
		Internal	Practical	Total	Attendance	File	Viva- Voce 1	Viva-Voce 2	Quiz 1	Quiz 2
02	1.0	60	40	100	10*	10	10	10	10	10

*** In proportion to the percentage of classes attended**

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