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**Presidency University**

**Bengaluru**

**School Of Computer Science and Engineering & Information Science**

**Summer Term End-Term Examinations, August 2024**

**Date**: 05-08-2024

**Time**: 1:00 pm-4:00 pm

**Max Marks**: 100

**Weightage**: 50%

**Odd Semester**: 2023 - 24

**Course Code**: CSE2026

**Course Name**: Data Handling and Visualization

**Department: Computer Science and Engineering**

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Do not write any matter on the question paper other than roll number.*

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| **Q.No** | **Questions** | **Marks** | **CO** | **RBT** |
| 1 | 1. Define data visualization. What are its main objectives? | 4 | CO1 | L1 |
| 1. Discuss the role of data visualization in location-based data contexts, providing an appropriate example. | 6 | CO1 | L2 |
| 1. Describe the process of preparing data prior to visualization, highlighting the benefits this preparation brings. Justify your response with a relevant scenario-based example. | 10 | CO1 | L3 |
| OR | | | | |
| 2 | 1. Explain the necessity of performing "Data Cleaning" before engaging in data visualization. Provide an example to illustrate your answer. | 4 | CO1 | L1 |
| 1. Analyze a weather forecasting scenario and discuss the potential applications of data visualization, including supporting diagrams. | 6 | CO1 | L2 |
| 1. Examine the matplotlib package for data visualization: a) State the purpose of matplotlib. b) Demonstrate how to create a simple line plot using matplotlib. | 10 | CO1 | L3 |

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| 3 | 1. Describe how altering the view (such as zooming or rotating) can enhance the comprehensibility of visualizations. | 4 | CO2 | L1 |
| 1. Discuss vector visualization techniques and their application in predicting natural disasters. | 6 | CO2 | L2 |
| 1. Explain the process of using matrix visualization techniques for data representation. Provide an example of a correlation matrix and describe how it can be interpreted | 10 | CO2 | L3 |

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| 4 | 1. Explain how size can be used as a visual variable in tree visualizations. | 4 | CO2 | L1 |
| 1. Outline the steps involved in creating a heat map for spatial data analysis and discuss why color choice is crucial for accurately conveying information. | 6 | CO2 | L2 |
| 1. Explain the importance of visual variables in improving the clarity of tree structures. How can designers use these variables to effectively communicate hierarchical information? | 10 | CO2 | L3 |

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| 5 | 1. Define multivariate data visualization and explain its significance. | 4 | CO3 | L1 |
| 1. Give an example of how data visualization can be utilized by marketing professionals to understand consumer behavior. | 6 | CO3 | L2 |
| 1. Provide a comparative analysis of data visualization usage in the healthcare and finance sectors. Highlight specific visualizations that have led to significant insights or improvements in each sector, the unique data challenges they face, and emerging trends that could influence their future development. | 10 | CO3 | L3 |

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| 6 | 1. Identify and describe a common challenge encountered when visualizing spatial data | 4 | CO3 | L1 |
| 1. Examine how text data visualization can aid in sentiment analysis. Use a detailed example, including types of visualizations that could represent data from social media feeds. | 6 | CO3 | L2 |
| 1. Discuss the essential considerations and techniques for visualizing streaming data from social media platforms during live events. Explain how these visualizations can impact real-time decision-making processes. | 10 | CO3 | L3 |

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| 7 | 1. Discuss how the choice of visualization type can influence the effectiveness of presenting streaming data. | 4 | CO4 | L1 |
| 1. Provide a thorough analysis of the steps involved in preparing streaming data for visualization. This should include data collection, data cleaning, and data aggregation, with a focus on the importance and challenges of each step, especially in the context of stock market data. | 6 | CO4 | L2 |
| 1. Explore the best practices for processing and visualizing streaming data for weather forecasting. Address the necessary technological infrastructure, the data types involved, the challenges encountered, and the impact of effective visualization on timely weather updates and public safety. | 10 | CO4 | L3 |

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| 8 | 1. Outline a specific technique used in streaming visualization and describe its advantages. | 4 | CO4 | L1 |
| 1. Evaluate different streaming visualization techniques and their applications in network traffic monitoring. Discuss the pros and cons of each technique concerning scalability and real-time performance. | 6 | CO4 | L2 |
| 1. Conduct a detailed discussion on the best practices and common mistakes in data visualization, using election result reporting as a case study. Analyze how these practices influence public understanding and perception of the results, and propose enhancements using the latest advancements in visualization technology | 10 | CO4 | L3 |

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| 9 | 1. Discuss why scaling is important in time-oriented data visualization. | 4 | CO1 | L1 |
| 1. Assess the impact of spatial data visualization on urban planning. Explain how the integration of GIS (Geographic Information Systems) with spatial data visualization assists urban planners in making informed decisions. | 6 | CO1 | L2 |
| 1. Evaluate the effectiveness of current visualization techniques for streaming data in high-frequency trading systems. Discuss ways to improve these techniques to provide traders with real-time insights, leading to better decision-making, and consider potential future advancements in streaming visualization technologies. | 10 | CO1 | L3 |

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| 10 | 1. Identify and explain a method used for analyzing streaming data. | 4 | CO2 | L1 |
| 1. Discuss best practices for managing and visualizing streaming data in a cybersecurity operations center. Consider the impact of real-time data visualization on threat detection and response strategies | 6 | CO2 | L2 |
| 1. Analyze how spatial data visualization can enhance decision-making processes in environmental science, especially in monitoring climate change effects. Discuss the role of satellite imagery and GIS data integration, the types of visualizations that can be generated, and their significance for policy-making and public awareness | 10 | CO2 | L3 |