CAP792:ADVANCE DATA VISUALIZATION

Course Outcomes: Through this course students should be able to

CO1 :: Define data visualizations in order to provide new insights into a research question or communicate information to the viewer.

CO2 :: Understand how Cultures of Practice influence the way data may be collected, described, or formatted.

CO3 :: Determine the basics of colors, views, and other popular and important visualization-based issues.

CO4 :: Analyze existing visualizations based on data visualization theory and principles.

CO5 :: Evaluate a visualization solution based on quantitative metrics such as time, error and qualitative metrics.

CO6 :: Construct and understand data prep flows that address common scenarios encountered in data preparation.

Unit I

Introduction to visualization of data : definition, methodology, visualization design objectives, key factors – purpose, visualization function and tone, data representation, data presentation, seven stages of data visualization, widgets, data visualization tools

Unit II

Visualizing data methods : mapping time series, scatterplot maps - trees, hierarchies and recursion, networks and graphs, info graphics, connections and correlations

Unit III

Visualizing data process : acquiring data, where to find data, tools for acquiring data from the internet, locating files for use with processing, loading text data, dealing with files and folders, listing files in a folder

Unit IV

Advanced Web Techniques : using a database, dealing with a large number of files, parsing data - levels of effort, tools for gathering clues, vectors and geometry, powerful tools- infogram, power BI, Google chart

Unit V

Interactive data visualization : drawing with data, scales, axes, updates, transition and motion, interactivity, layouts, geomapping, D3.js framework, tableau

Unit VI

Security data visualization : port scan visualization, vulnerability assessment and exploitation, firewall log visualization, intrusion detection log visualization -attacking and defending visualization systems, creating security visualization system.

Text Books:

1. DESIGNING DATA VISUALIZATIONS: REPRESENTING INFORMATIONAL RELATIONSHIPS by JULIE STEELE, NOAH ILIINSKY, O'REILLY

References:

1. DATA VISUALIZATION: INTRODUCTION TO DATA VISUALIZATION WITH PYTHON, R AND TABLEAU by ROBERT COLLINS, CREATESPACE INDEPENDENT PUBLISHING PLATFORM