FOUNDATIONS OF DATA SCIENCE SYLLABUS

Module 1: Data Science Context

- Need for Data Science
- What is Data Science
- Data Science Process
- Business Intelligence and Data Science
- Prerequisites for a Data Scientist
- Tools and Skills Required

Module 2: Databases for Data Science

- Structured Query Language (SQL)
    - Basic Statistics
    - Data Munging
    - Filtering
    - Joins
    - Aggregation
    - Window Functions
    - Ordered Data
- Preparing No-SQL Databases
    - Document Databases
    - Wide-column Databases
    - Graphical Databases

Module 3: Data Science Methodology

- Analytics for Data Science
- Examples of Data Analytics
- Data Analytics Lifecycle
    - Data Discovery
    - Data Preparation
    - Model Planning
    - Model Building
    - Communicating Results

Module 4: Data Analytics on Text

- Major Text Mining Areas
- Information Retrieval
- Data Mining
- Natural Language Processing (NLP)
    - Text Analytics Tasks
        - Cleaning and Parsing
        - Searching
        - Retrieval
        - Text Mining
        - Part-of-Speech Tagging
        - Stemming
        - Text Analytics Pipeline
    - Major Components of NLP
    - Stages of NLP
    - NLP Applications

Module 5: Platform for Data Science

- Python for Data Science
    - Python Libraries
    - Data Frame Manipulation with `numpy` and `pandas`
    - Exploratory Data Analysis
    - Time Series Dataset
    - Clustering with Python
    - Dimensionality Reduction
- Python Integrated Development Environments (IDEs) for Data Science

Module 6: GNU Octave for Mathematical Operations

- Handling Vectors and Matrices
    - Multiplication
    - Transpose
    - Random Matrix Creation
    - Eigen Vectors and Eigen Values
    - Determinants
- Arithmetic Operations

- Set Operations
- Plotting Data

Module 7: Tableau

- Tableau Introduction
- Dimensions and Measures
- Descriptive Statistics
- Basic Charts
- Dashboard Design Principles
- Special Chart Types
- Integrating Tableau with Google Sheets
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