CLOUD VISION TECHNOLOGIES

Course Curriculum

Data Analytics

The Best Training Institute in Hyderabad

1. Introduction to Data Analysis

- Overview of Data Analysis
- What is Data Analysis?
- Importance of Data-Driven Decision Making
- Applications in Different Industries

2. Statistics for Data Analysis

Descriptive Statistics

- Measures of Central Tendency (Mean, Median, Mode)
- Measures of Dispersion (Range, Variance, Standard Deviation)
- Data Visualization (Histograms, Box Plots)

Inferential Statistics

- Sampling Methods
- T-Tests, ANOVA
- Chi-Square Tests
- Correlation and Regression

3. Python for Data Analysis

Introduction to Python

- Python Basics (Variables, Data Types, Loops, Conditionals)
- Python Libraries Overview
- Loading, Cleaning, and Manipulating Data
- Handling Missing Values
- Data Aggregation and Grouping
- Merging and Joining Datasets
- Matplotlib and Seaborn Basics
- Creating Line, Bar, Scatter, and Box Plots
- Customizing Plots for Better Insights
- Arrays, Indexing, and Broadcasting
- Mathematical and Statistical Functions

4. SQL for Data Analysis

Introduction to SQL

- SQL Syntax, SELECT Statements
- Filtering Data (WHERE, AND, OR, NOT) Data Querying

Data Querying

- Aggregate Functions (SUM, AVG, COUNT, MAX, MIN)
- GROUP BY, HAVING, and ORDER BY Clauses
- Joining Tables (INNER, LEFT, RIGHT, FULL JOINS)

Advanced SQL Concepts

- Sub queries and Nested Queries
- Common Table Expressions (CTE)
- Window Functions (ROW_NUMBER, RANK)

SQL Data Types

- Numeric types (INT, FLOAT, DECIMAL)
- Character types (CHAR, VARCHAR, TEXT)
- Date and time types (DATE, TIME, TIMESTAMP)
- Boolean types
- BLOB (Binary Large Object)

Basic SQL Queries

- SELECT statement
- WHERE clause and logical operators (AND, OR, NOT)

- ORDER BY clause
- LIMIT and OFFSET clauses
- DISTINCT keyword

SQL Functions

- Aggregate functions (COUNT, SUM, AVG, MIN, MAX)
- Scalar functions (UPPER, LOWER, LENGTH, ROUND)
- Date functions (NOW, CURDATE, DATE_ADD, DATE_SUB)

Subqueries and Nested Queries

- Single-row subqueries
- Multi-row subqueries
- Correlated subqueries
- EXISTS and NOT EXISTS clauses

Data Manipulation Language (DML)

- CREATE TABLE
- ALTER TABLE (add, modify, drop columns)
- DROP TABLE
- CREATE VIEW, DROP VIEW

Indexes in SQL

- Purpose of indexes
- Types of indexes (single-column, multi-column)
- Unique and non-unique indexes
- Full-text index
- Index performance considerations

5.Data Visualization with Tableau

- Introduction to Tableau
- Tableau Interface and Workflow
- Connecting to Different Data Sources
- Basic Visualizations in Tableau
- Creating Bar, Line, and Pie Charts
- Filters, Slicers, and Sorting
- Designing Dashboards and Stories

Advanced Tableau Features

- Calculated Fields, Table Calculations
- Dual-Axis Charts, Heatmaps, and Treemaps
- Using Parameters in Visualizations

6. Machine Learning with Python

Introduction to Machine Learning

- Supervised vs Unsupervised Learning
- ML Workflow and Algorithms Overview

Supervised Learning

- Linear Regression, Logistic Regression
- Decision Trees, Random Forests
- Evaluation Metrics (Accuracy, Precision, Recall, F1-Score)

Unsupervised Learning

- Clustering (K-Means, Hierarchical)
- Dimensionality Reduction (PCA)
- Model Selection and Tuning
- Cross-Validation Techniques

7. Excel

Module 1: Advanced Data Handling

Data Cleaning and Transformation

- Removing duplicates
- Handling blank cells and errors
- Advanced filtering and sorting techniques
- Text-to-Columns, Flash Fill, and Data Validation

Advanced Functions and Formulas

- Nested IF statements
- LOOKUP functions (VLOOKUP, HLOOKUP, INDEX & MATCH)
- Using XLOOKUP for flexible data searching
- Statistical functions (AVERAGEIF, COUNTIF, SUMIF, etc.)
- Array formulas and dynamic arrays

Error Handling in Formulas

- IFERROR, IFNA
- Detecting and managing formula errors effectively

Module 2: Data Analysis and Visualization

Pivot Tables and Pivot Charts

- Creating and customizing Pivot Tables
- Calculated fields and items
- Grouping data within Pivot Tables
- Slicers and timelines for dynamic filtering
- Using Pivot Charts for visualization

Advanced Charting Techniques

- Combination charts (e.g., line and bar charts)
- Dynamic and interactive charts (using slicers)
- Creating Waterfall, Pareto, and Funnel charts
- Heat maps, sparklines, and data bars for quick analysis

Data Modeling with Power Query

- Data extraction, transformation, and loading (ETL)
- Merging, appending, and unpivoting data tables
- Custom columns and conditional columns
- Creating automated data transformation pipelines

Module 3: Excel Automation with VBA

Introduction to VBA (Visual Basic for Applications)

- Recording macros and basic VBA concepts
- Writing and running simple VBA code

Advanced VBA for Automation

- Working with loops and conditional statements
- Automating repetitive tasks (e.g., data cleaning, reporting)
- Creating user-defined functions (UDFs)
- Error handling and debugging in VBA

Building User Forms and Dashboards with VBA

- Creating interactive user forms
- Using form controls and event-driven programming
- Automating dashboards with VBA

Module 4: Power Pivot and Data Modeling

Data Models and Power Pivot

- Creating and managing data models
- Building relationships between tables

DAX (Data Analysis Expressions) for Advanced Calculations

- Basic DAX functions (SUMX, CALCULATE, FILTER)
- Advanced DAX (Time intelligence, ranking, cumulative totals)
- Calculated columns and measures

Using Power Pivot in Dashboards and Reports

- Integrating Power Pivot data models with Pivot Tables
- Building interactive dashboards with Power Pivot

Module 5: Advanced Excel Techniques for Data Reporting

Advanced Conditional Formatting

- Custom formulas for conditional formatting
- Formatting based on multiple criteria
- Using icons and color scales for data representation

What-If Analysis and Scenario Planning

- Goal Seek, Data Tables, and Scenario Manager
- Solver for optimization problems

Connecting Excel with External Data Sources

- Importing data from databases, websites, and other files
- Automating data refresh and updating reports

Module 6: Excel for Business Intelligence

Introduction to Power BI Integration

- Connecting Excel data to Power BI
- Creating Excel Power BI dashboards

Case Studies and Practical Applications

- Financial analysis
- reporting and forecasting
- Resource and project management

8. Power BI

Module 1: Introduction to Power BI

Overview of Power BI

- Understanding the Power BI ecosystem: Desktop, Service, and Mobile
- Use cases and applications in business intelligence

Power BI Interface and Basic Operations

- Navigating the Power BI Desktop interface
- Importing and connecting to data sources (Excel, CSV, SQL, Web data)
- Data refresh and scheduled updates

First Steps with Data Visualization

- Creating basic visualizations (bar charts, line charts, tables)
- Adding visualizations to the report canvas
- Customizing and formatting visual elements

Module 2: Data Preparation with Power Query

Data Cleaning and Transformation

- Data cleansing techniques (remove duplicates, fill missing values, etc.)
- Transforming data with Power Query Editor
- Merging and appending queries

Data Shaping and Structuring

- Unpivoting data for better analysis
- Creating calculated columns and conditional columns
- Using Power Query for ETL (Extract, Transform, Load)

Creating Parameters and Custom Functions

- Building parameters for dynamic queries
- Writing M code for advanced transformations

Module 3: Data Modeling in Power BI

Data Modeling Fundamentals

- Understanding relationships and data cardinality
- Building relationships between tables (one-to-one, one-to-many)
- Star schema and snowflake schema design

Calculated Columns and Measures with DAX

- Introduction to DAX (Data Analysis Expressions)
- Creating calculated columns and measures
- Basic DAX functions (SUM, AVERAGE, COUNT)

Advanced DAX for Business Logic

- Time intelligence functions (e.g., year-to-date, month-over-month)
- Creating dynamic calculations with DAX
- Filtering and row context for custom calculations

Module 4: Data Visualization and Reporting

Advanced Visualizations

- Using Power BI's built-in visualizations effectively
- Custom visuals from the Power BI marketplace
- Drillthrough, bookmarks, and tooltips for interactivity

Creating Interactive Reports and Dashboards

- Designing intuitive and user-friendly dashboards
- Setting up slicers and filters for dynamic reporting
- Using themes and templates for visual consistency

Maps and Geospatial Analysis

- Creating map visualizations with geographic data
- Using ArcGIS Maps and filled maps for spatial insights

Module 5: Power BI Service and Sharing

Publishing to Power BI Service

- Uploading reports to Power BI Service
- Managing workspace and content distribution

Creating and Managing Dashboards

- Pinning visuals to dashboards
- Setting up real-time dashboards with streaming data
- Data refresh and schedule management

Collaborating and Sharing

- Creating and managing shared workspaces
- Embedding Power BI reports into other applications (Teams, SharePoint)
- Managing permissions and access

Module 6: Advanced Analytics and AI in Power BI

Using AI Visuals in Power BI

- Uploading reports to Power BI Service
- Managing workspace and content distribution

Power BI and R/Python Integration

- Using R and Python scripts for custom visualizations
- Data cleansing and advanced analytics with Python or R

Time Series and Forecasting

- Creating and visualizing forecast models
- Applying what-if parameters for scenario analysis

Module 7: Power BI Administration and Best Practices

Power BI Administration

- Admin roles and responsibilities in Power BI
- Managing Power BI licenses and user accounts

Performance Optimization

- Optimizing DAX calculations and queries
- Best practices for data model optimization

Security and Compliance

- Row-level security for controlled data access
- Data governance and compliance in Power BI

Module 8: Capstone Project and Case Studies

Building End-to-End BI Solutions

- Hands-on project: creating a complete BI solution
- Defining business requirements and KPIs

- Designing and building a data model, reports, and dashboard

Case Studies and Industry-Specific Applications

- Financial analysis, sales and marketing insights, HR analytics
- Applying Power BI solutions to real-world business scenarios

9. R for Data Analysis

Introduction to R (2 hours)

- R Basics (Variables, Data Structures)
- RStudio Overview
- Filtering and Selecting Data
- Summarizing and Grouping Data
- Handling Missing Data
- Basic Plotting with ggplot2
- Advanced Visualizations (Faceting, Themes)
- Exporting Plots for Reports

- Performing t-tests, ANOVA, and Correlation in R
- Running Regression Models in R

10. Capstone Project (6 hours)

- Capstone Project Overview (2 hours)
- Real-World Data Analysis Project
- Problem Definition, Data Gathering, and Processing
- Implementing the Data Analysis Process
- Presenting Insights, Visualizations, and Recommendations

CLOUD VISION TECHNOLOGIES

OUR HIGHLIGHTS

- Industry Expert Trainers
- Per Batch 10 Students (Offline & Online)
- Weekdays & Weekend Classes
- State - Of - The Art - Infrastructure
- Practice Test & Mock Interviews
- 100% Placement Assistance*
- Course Completion Certificate

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