

A large blue rectangular box containing the title text. The background of the entire advertisement features a network diagram with nodes and lines, overlaid with icons for a bank, an ATM, and a user profile. A woman in a business suit is visible in the lower-left corner.

# Data Science & AI for BFSI Professionals



-300+ Hiring Partners



-Hybrid Model for Project  
Sessions



-175% Average Salary Hike



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## About The Program



**2cr**

worth  
scholarships  
awarded



**600+**

professionals  
secured jobs  
after a career  
break



**35k+**

Trusted  
Learner  
s

The Data Science & AI Program for BFSI Professionals is perfect for professionals seeking to advance their careers in the fast-paced financial field. It covers financial data analysis, risk management, investment banking, and more. Professionals gain industry knowledge and practical skills, making them ideal candidates for roles in portfolio management, financial analysis, and risk management. Our goal is to provide affordable education that helps India's workforce succeed.



**We exist to provide accessible, reasonable, and industry-relevant education that empowers India's workforce to grow and develop.**



4.79/5



4.66/5



4.8/5



Thousands of student reviews on Switchup,  
Course Report, Google and more



# Program Highlights



## Industry-Relevant & Updated Syllabus

Learn new tools, techniques & trends. Get access to industry-level curriculum.



## 360 Degree Knowledge Building

Develop practical skills through real-world projects and assignments



## 1:1 Dedicated Mentorship

Personalized learning experience from experienced industry professionals.



## Multiple Career Opportunities

Advance finance career with roles like financial analyst, financial planner, etc.

# Program Details

## COURSE PREREQUISITE

Prior knowledge of **programming/coding** is not mandatory. Just the urge to learn programming and basic ideas about advanced math is enough.

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## PROGRAM ELIGIBILITY

- ✔ **Working professionals** having more than 6 months of experience in any domain (Technical/Non-Technical)
- 

## KEY FEATURES

- ✔ Dedicated Placement Cell | 100% Guaranteed Interview calls
  - ✔ Globally Recognised **Certification from IBM & Microsoft**
- 

## JOB ROLES TO TARGET

Get equipped with the industry relevant skills and aim for job roles like Financial Data Analyst, Risk Analyst, Insurance Data Analyst, Fraud Detection Analyst etc.

Click below

[Check Eligibility](#)

# Alumni Spotlight



**Shravanthi A**  
Data Scientist

Learnbay has helped me a lot to learn data science applications in the e-commerce industry. The live class concept was really helpful in receiving proper DS training. Thanks to all my mentors and the placement team.

**Mechanical  
Domain**



**Data Scientist @**



**230%**  
Salary Hike



**Preksha Mishra**  
Lead Data Scientist

The course structure is excellent with emphasis on concept building and tools & software at the same time. The support team is excellent and supportive and quite agile to respond to doubts.

**Telecom  
Domain**



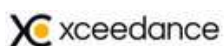
**Data Scientist @**



**140%**  
Salary Hike



**Karan Chawala**



**EXL**

**Data Scientist**



**Jaya Sinha**



**Infosys**

**Senior Analyst**



**Shubham Dev**

publicis  
sapient



**brillio**

**Lead Data Analyst**

# Alumni Spotlight



Mohd. Israr  
Data Scientist

Thanks to the Learnbay data science course & excellent guidance, I was able to ace the TCS interview and secure a job with a 210% pay raise. The real-world time projects helped me develop my concepts as a data scientist.

Mechanical  
Domain



Data Scientist @



**210%**  
Salary Hike



Saurabh Kumar  
Data Scientist

When I joined Learnbay I did not have any knowledge apart from the very basics. I gradually build my concept via various trainers and get trained in data science with strong knowledge/concepts.

Mathematics  
Professor



Data Scientist @ Teleperformance

**135%**  
Salary Hike



Aravind

TheMathCompany



**CATERPILLAR®**

Senior Data Scientist



Ritesh Kumar

unacademy



Capgemini

Data Scientist



Ramki

cognizant



**ANBSYSTEMS**  
energizing solutions

Data Analyst

# Learnbay's ProjectLab

Choose Learnbay for your career journey because we're more than just a training provider. Our Project Innovation Lab lets you apply your skills in real-world scenarios. Get [dual certifications](#) for a competitive edge. Specialize in your desired domain. Discover how Learnbay can boost your career growth. Don't settle for less – choose Learnbay, your path to success!

## 1 Project Innovation Lab



Work in an industry like environment and gain practical hands-on experience of data scientist with dedicated mentors from industry.

## 2 Domain Electives



Enhance career prospects and excellence in your chosen field with our domain electives.

## 3 Dedicated Placement Cell



Experience 100% job assistance with guaranteed interview call from leading MNCs and startups globally.

## 4 Degree & Certification



Gain top-notch skills for a successful career through our degree and certification program



# 1 Project Innovation Lab

Learnbay's Project Innovation Lab replicates industry like environment for real time projects. With our **ProjectLab**, you gain real proof of hands-on experience by having your project certified by the industry.

In our ProjectLab, you work like a data scientist with dedicated project mentors from industry and get certified on capstone project.

<p><b>450+</b> Hiring Partners</p> <p> <b>PUNE</b></p> <p></p>		<p> 1-1 Doubt Session</p> <p> <b>HYDERABAD</b></p>
<p> <b>35k</b> Trusted Learners</p>		<p> <b>Capstone Project Certificate from IBM</b></p> <p></p> <p> <b>DELHI</b></p>
	<p></p> <p> <b>BENGALURU</b></p>	<p><b>Project Innovation Labs Across India</b></p>

# 2 Domain Electives


We offer Domain Electives for various industries including Retail and Supply Chain. This ensures that you gain expertise directly relevant to your current domain.

With our program, you can make your past domain experience relevant and position yourself for a significant salary hike.



## Supplychain, E-com & Retail

Enhancing supply chain visibility and customer experience with data.

Brochure 

# 3 Career Service

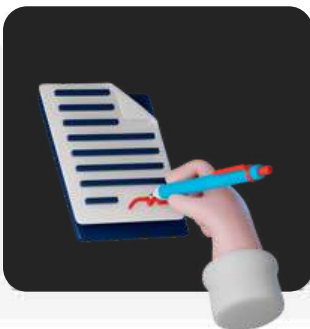


## **Get 1 year of Job and Placement support**

Unleash your career potential with 1 year of unlimited job access, interview support, and profile review.

## **Get 1 mock interviews with industry leaders**

Master the art of HR analytics and stay ahead of the curve with mockups and industry insights

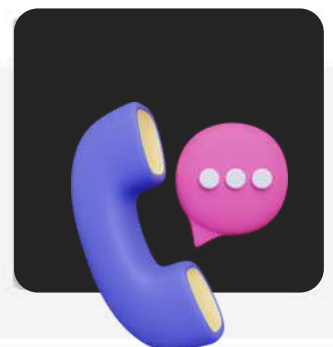


## **Resume build up session**

Craft a powerful resume showcasing your expertise in hr to stand out from the competition.

## **Get 4 interview calls**

Receive 4 interview calls from a diverse pool of interested employers/recruiters.



# 4 Certificates



World's leading certifications



## IBM Course Certificate

Complete your training with the globally recognized certificate.



## Microsoft Course Certificate







Achieve professional growth & increase earning potential with Microsoft certification.



## IBM Capstone Project Certificate

Highlight your skills & boost your project portfolio with capstone project certificate.

# Others Vs Learnbay

Benefits		Learnbay	Others
	Guaranteed Interview Calls	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Industry capstone project certificate from IBM	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Domain specialized programs for professionals	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	100% live interactive sessions with industry experts	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	On-demand video call with industry experts	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Personalised Resume Review Session	<input checked="" type="checkbox"/>	<input type="checkbox"/>



# Program Fee & Financing



## Scholarship



Scholarships are awarded based on profile review. Eligible candidates can avail upto 25% scholarship on desired courses. Click the button below to apply.

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**₹ 6,228/month**

No Cost EMI

 **Razorpay**

  
LIQUILOANS

 **Propelld**

 **ShopSe**

**Program Fee**

**Rs. 95,000/-**

exclusive of GST

# Learning Path



01

**Cohort Orientation +  
Preparatory Classes**

02

**Python Programming  
(Basic + Advance)**

Python, Anaconda, Github, Pandas

03

**Statistics and Machine  
Learning**

Matplotlib, Scikit-Learn, Seaborn

04

**Data Science Tools**

Matplotlib, SQL, MongoDB, Tableau,  
PowerBI, Big Data & Spark Analytics,  
Time Series

05

**AI Tools**

Deep Learning, NLP,  
Deployment (AWS+Azure)

# Program Syllabus

## BFSI

### Introduction to Banking, Financial Services and Insurance (BFSI)

- Overview of BFSI domain and financial institutions and services
- Managing customer data and customer segmentation using real-time and predictive analytics
- Process automation and security measures in BFSI domain
- Fraud detection techniques and their importance in BFSI
- Underwriting and credit scoring techniques in insurance and banking sector
- Risk modeling and management for investment banks
- Data visualization techniques for financial data using tools like Tableau and PowerBI
- Time series analysis for forecasting financial trends and investment opportunities
- Portfolio management and optimization techniques
- Regulatory compliance and reporting requirements in the BFSI sector

### Overview of Domains

- Introduction to BFSI, Marketing, and Sales domains
- Importance of analytics in these domains
- Tools and techniques for process automation
- Current trends and challenges in these domains

**Case studies:** This section includes case studies from various industries and domains to illustrate the application of business analytics in real-world scenarios.

## Preparatory Session

## Module 0 (08 hours)

### Preparatory Session

- A brief introduction to tools related to data
- Learn about particular real-time projects and Capstone projects
- Data and its impact on career opportunities
- Fundamental relevance of projects using data
- Role of data in businesses
- Significance of data in decision-making
- Scope of data in research and development
- Utilizing data, to enhance industrial operations and management
- Data in performance evaluation
- Data in customer segmentation

### Fundamentals of Statistics

- Mean, Median, Mode
- Standard Deviation, Average.
- Probability, permutations, and combinations
- Introduction to Linear Algebra

### Fundamentals of programming

- Types of code editors in python
- Introduction to Anaconda & Jupyter notebook
- Flavors of python
- Introduction to Git, GitHub
- Python Fundamentals
- Source code vs Byte code vs Machine code
- Compiler & Interpreter
- Memory Management in Python

### Tools covered



## Python Programming

## Module 1 (50 hours)

### Programming Basics & Environment Setup

- Installing Anaconda, Anaconda Basics and Introduction
- Get familiar with version control, Git and GitHub.
- Basic Github Commands.
- Introduction to Jupyter Notebook environment. Basics Jupyter notebook Commands.
- Programming language basics

### Strings, Decisions & Loop Control

- Working With Numbers, Booleans
- and Strings, String types and formatting, String operations
- Simple if Statement, if-else Statement
- if-elif Statement.
- Introduction to while Loops, for Loops, Using continue and break

#### Class Hands-on:

- 6 programs/coding exercise on string, loop and conditions in classroom

### Functions And Modules

- Introduction To Functions
- Defining & Calling Functions
- Functions With Multiple Arguments

### Python Programming Overview

- Python Overview
- Python 2.7 vs Python 3
- Writing your First Python Program
- Lines and Indentation, Python Identifiers
- Various Operators and Operators Precedence
- Getting input from User, Comments, Multi line Comments

### Python Data Types

- List, Tuples, Dictionaries
- Python Lists, Tuples, Dictionaries Accessing Values, Basic Operations
- Indexing, Slicing, and Matrixes
- Built-in Functions & Methods
- Exercises on List, Tuples And Dictionary

### Functions And Modules

- Anonymous Functions - Lambda
- Using Built-In Modules, User-Defined Modules, Module Namespaces,
- Iterators And Generators

#### Class Hands-on:

8+ Programs to be covered in class of functions, Lambda, modules, Generators and Packages.



## Python Programming

## Module 1 (50 hours)

### File I/O And Exceptional Handling and Regular Expression

- Opening and Closing Files
- open Function, file Object Attributes
- close() Method, Read, write, seek.
- Exception Handling, try-finally Clause
- Raising an Exceptions, User-Defined Exceptions
- Regular Expression- Search and Replace
- Regular Expression Modifiers
- Regular Expression Patterns

#### Class hands-on :

- 10+ Programs to be covered in class from File IO, Reg-ex and exception handling.

### Data Analysis Using Pandas

- Pandas : Introduction to Pandas
- Importing data into Python
- Pandas Data Frames, Indexing Data Frames ,Basic Operations With Data frame, Renaming Columns, Subsetting and filtering a data frame.

### Data Analysis Using Numpy

- Introduction to Numpy. Array Creation, Printing Arrays, Basic Operation - Indexing, Slicing and Iterating, Shape Manipulation - Changing shape, stacking and splitting of array
- Vector stacking, Broadcasting with Numpy, Numpy for Statistical Operation

#### Assignment 1 (Week 2):

10 Coding exercises on Python Basics - Variables, Operators, Strings, Loops, Control Statement

#### Assignment 2 (Week 3):

10 Python programs and practice set on List, Tuples, Dictionaries & Matrices operations

#### Assignment 3 (Week 4):

10 Coding exercises on Functions, Lambda, Input-Output, File and Regular Expression

### Python Programming

### Module 1 (50 hours)

#### Data Visualization using Matplotlib

- **Matplotlib:** Introduction, plot(), Controlling Line Properties, Subplot with Functional Method, Multiple Plot, Working with Multiple Figures, Histograms

#### Data Visualization using Seaborn

- **Seaborn:** Intro to Seaborn And Visualizing statistical relationships , Import and Prepare data. Plotting with categorical data and Visualizing linear relationships.
- Seaborn Exercise

### CASE STUDY

3 Case Study on Numpy, Pandas, Matplotlib

1 Case Study on Pandas And Seaborn

#### Assessment Test in Python :

- 2 hour of Assesment Test in Python  
(Coding & Objective Questions )

Real time Use cases in Python to be Covered in Class with 5 assignments



## Statistics

### Module 1 (30 hours)

#### Fundamentals of Math and Probability

- Probability distributed function & cumulative distribution function. Conditional Probability, Baye's Theorem
- Problem solving for probability assignments
- Random Experiments, Mutually Exclusive Events, Joint Events, Dependent & Independent Events

#### Introduction to Statistics, Statistical Thinking

- Variable and its types
- Quantitative, Categorical, Discrete, Continuous,
- \*all with examples

#### Five Point Summary and Box Plot

- Outliers, Causes of Outliers, How to treat Outliers, I-QR Method and Z-Score Method

#### Inferential Statistics

- Central Limit Theorem
- Point estimate and Interval estimate
- Creating confidence interval for population parameter

#### All about Population & Sample

- Population vs Sample, Sample Size
- Simple Random Sampling, Systematic Sampling, Cluster Sampling, Stratified Sampling, Convenience Sampling, Quota Sampling, Snowball Sampling and Judgement Sampling

#### Descriptive Statistics

- Measures of Central Tendency – Mean, Median and Mode
- Measures of Dispersion – Standard Deviation, Variance, Range, IQR (Inter-Quartile Range)
- Measure of Symmetry/ Shape – Skewness and Kurtosis

#### Inferential Statistics

- Characteristics of Z-distribution and T-Distribution.
- Type of test and rejection region.
- Type of errors in Hypothesis Testing

### Statistics

### Module 1 (30 hours)

#### Hypothesis Testing

- Type of test and Rejection Region
- Type o errors-Type 1 Errors, Type 2 Errors. P value method, Z score Method. The Chi-Square Test of Independence.
- Regression. Factorial Analysis of Variance. Pearson Correlation Coefficients in Depth. Statistical Significance
- Null and Alternative Hypothesis One-tailed and Two-tailed Tests, Critical Value, Rejection region, Inference based on Critical Value
- **Binomial Distribution:** Assumptions of Binomial Distribution, Normal Distribution, Properties of Normal Distribution, Z table, Empirical Rule of Normal Distribution & Central Limit Theorem and its Applications

#### Data Processing & Exploratory Data Analysis

- What is Data Wrangling
- Data Pre-processing and cleaning?
- How to Restructure the data?
- What is Data Integration and Transformation

#### Linear Algebra

- Dot Product, Projecting Point on Axis.
- Matrices in Python, Element Indexing, Square Matrix, Triangular Matrix, Diagonal Matrix, Identity Matrix, Addition of Matrices, Scalar Multiplication, Matrix Multiplication, Matrix Transpose, Determinant, Trace
- T-Test, Analysis of variance (ANOVA), and Analysis of Covariance (ANCOVA) Regression analysis in ANOVA

#### Class Hands-on:

- Problem solving for C.L.T Problem solving Hypothesis Testing Problem solving for T-test, Z-score test Case study and model run for ANOVA, ANCOVA

### Statistics

### Module 1 (30 hours)

#### EDA

- Finding and Dealing with Missing Values.
- What are Outliers?
- Using Z-scores to Find Outliers.
- Bivariate Analysis, Scatter Plots and Heatmaps.
- Introduction to Multivariate Analysis

Note: Problem-Solving Techniques and Case Studies using Statistics will be covered in class from week 2

**Statistics Assignments : Total 4 practice set and Assignments from Statistics**



## Machine Learning

## Module 2 (40 hours)

### Machine Learning Introduction

- Definition, Examples, Importance of Machine Learning
- Definition of ML Elements: Algorithm, Model, Predictor Variable, Response Variable, Training - Test Split, Steps in Machine Learning,
- ML Models Type: Supervised Learning, Unsupervised Learning and Reinforcement Learning

### Data Preprocessing

- Encoding the data: Definition, Methods: OneHot Encoding, Mean Encoding, Label Encoding, Target Guided Ordinal Encoding

### Evaluation Metrics for Classification model

- Confusion Matrix, Accuracy, Misclassification, TPR, FPR, TNR, Precision, Recall, F1 Score, ROC Curve, and AUC. Using Python library Sklearn to create the Logistic Regression Model and evaluate the model created

### Data Preprocessing

- Types of Missing values (MCAR, MAR, MNAR) , Methods to handle missing values
- Outliers, Methods to handle outliers: IQR Method, Z Method
- Feature Scaling: Definition , Methods: Absolute Maximum Scaling, Min-Max Scaler , Normalization, Standardization, Robust Scaling

### Logistic Regression Model

- Definition. Why is it called the "Regression model"?
- Sigmoid Function, Transformation & Graph of Sigmoid Function

### K Nearest Neighbours Model

- Definition, Steps in KNN Model, Types of Distance: Manhattan Distance, Euclidean Distance, 'Lazy Learner Model'.
- Confusion Matrix of Multi Class Classification
- Using Python library Sklearn to create the K Nearest Neighbours Model and evaluate the model

## Machine Learning

### Module 2 (40 hours)

#### Decision Tree Model

- Definition, Basic Terminologies, Tree Splitting Constraints, Splitting Algorithms:
- CART, C4.5, ID3, CHAID
- Splitting Methods:
- GINI, Entropy, Chi-Square, and Reduction in Variance
- Using Python library Sklearn to create the Decision Tree Model and evaluate the model created

#### Hyperparameter Tuning

- GridSearchCV, Variable Importance.
- Using Python library Sklearn to create the Random Forest Model and evaluate the model created.
- Use cases

#### Random Forest Model

- Ensemble Techniques: Bagging/bootstrapping & Boosting.
- Definition of Random Forest, OOB Score
- K-Fold Cross-Validation

#### Naive Baye's Model

- Definition, Advantages, Baye's Theorem Applicability, Disadvantages of Naive Baye's Model, Laplace's Correction, Types of Classifiers: Gaussian, Multinomial and Bernoulli
- Using Python library Sklearn to create the Naive Baye's Model and evaluate the model created

## CASE STUDY

- **Business Case Study for Kart Model**
- **Business Case Study for Random Forest**
- **Business Case Study for SVM**
- **To classify an email as spam or not spam using logistic Regression.**
- **Application of Linear Regression for Housing Price Prediction**

## Machine Learning

### Module 2 (40 hours)

#### **K Means and Hierarchical Clustering**

- Definition of Clustering, Use cases of Clustering
- K Means Clustering Algorithm, Assumptions of K Means Clustering
- Sum of Squares Curve or Elbow Curve

#### **Hierarchical Clustering**

- Dendrogram, Agglomerative Clustering, Divisive Clustering, Comparison of K Means Clustering and Hierarchical Clustering
- Using Python library Sklearn to create and evaluate the clustering model

#### **Principal Component Analysis(PCA)**

- Definition, Curse of Dimensionality, Dimensionality Reduction Technique, When to use PCA,
- Use Cases
- Steps in PCA, EigenValues and EigenVectors, Scree Plot.
- Using Python library Sklearn to create Principal Components

#### **Support Vector Machine(SVM)**

- Model: Definition, Use Cases, Kernel Function, Aim of Support Vectors, Hyperplane, Gamma Value, Regularization Parameter
- Using Python library Sklearn to create and evaluate the SVM Model

#### **Summary of all Machine Learning Models and Discussion about the Capstone Project**

Note : All Machine Learning Algorithms are covered in depth with real time case studies for each algorithm. Once 60% of ML is completed, Capstone Project will be released for the batch.

### CASE STUDY

### Module 2 (40 hours)

- Recommendation Engine for e-commerce/retail chain
- Twitter data analysis using NLP



## SQL

### Module 1 (14 hours)

#### SQL and RDBMS

- RDBMS And SQL Operations.
- Single Table Queries - SELECT, WHERE,
- ORDER BY, Distinct, And, OR
- Multiple Table Queries: INNER, SELF,
- CROSS, and OUTER, Join, Left Join, Right
- Join, Full Join, Union

#### NoSQL, HBase & MongoDB

- NoSQL Databases
- Introduction to HBase
- HBase Architecture, HBase
- Components, Storage Model of HBase
- HBase vs RDBMS
- Introduction to Mongo DB, CRUD
- Advantages of MongoDB over RDBMS

#### Programming with SQL

- Mathematical Functions
- Variables
- Conditional Logic
- Loops
- Custom Functions
- Grouping and Ordering

#### Advance SQL

- Advance SQL Operations
- Data Aggregations and summarizing the data
- Ranking Functions: Top-N Analysis
- Advanced SQL Queries for Analytics

#### JSON Data & CRUD

- Basics and CRUD Operation
- Databases, Collection & Documents
- Shell & MongoDB drivers
- What is JSON Data
- Create, Read, Update, Delete
- Finding, Deleting, Updating, Inserting Elements
- Working with Arrays
- Understanding Schemas and Relations

#### Programming with SQL

- Partitioning
- Filtering Data
- Subqueries



## SQL

### Module 1 (14 hours)

#### Assignments

- Working with multiple tables
- Practice Joins, Grouping and Subqueries
- Using GROUP BY and HAVING Clauses
- Practice Aggregation Queries

## MongoDB

## Module 2 (14 hours)

### Introduction to MongoDB

- What is MongoDB
- Characteristics and Features
- MongoDB Ecosystem
- Installation process
- Connecting to MongoDB database
- Introduction to NoSQL
- Introduction of MongoDB module
- What are Object Ids in MongoDB

### Assignment

- Obtain the data in the format you want by formulating queries that are both effective and high-performing.

### MongoDB (Advance)

- MongoDB Use cases
- MongoDB Structures
- MongoDB Shell vs MongoDB Server
- Data Formats in MongoDB
- MongoDB Aggregation Framework
- Aggregating Documents
- Working with MongoDB Compass & exploring data visually
- Understanding Create, Read, Update, Delete
- Schemas & Relations
- Document Structure
- Working with Numeric Data
- Working on Scheme Designing

### Tools covered



## Tableau

## Module 3 (14 hours)

### Introduction to Tableau

- Connecting to data source
- Creating dashboard pages
- How to create calculated columns
- Different charts

### Dashboard and Stories

- Working in Views with Dashboards and Stories
- Working with Sheets
- Fitting Sheets
- Legends and Quick Filters
- Tiled and Floating Layouts, Floating Objects

### Hands-on Assignments

- Connecting data source and data cleansing
- Working with various charts
- Deployment of Predictive model in visualization

### Visual Analytics

- Getting Started With Visual
- Analytics Sorting and grouping
- Working with sets, set action
- Filters: Ways to filter, Interactive Filters
- Forecasting and Clustering

### Tableau (Advance)

- Mapping
- Coordinate points
- Plotting Latitude and Longitude
- Custom Geocoding
- Polygon Maps
- WMS and Background Image

### Tools covered



## Power BI

### Module 4 (14 hours)

#### Getting Started With Power BI

- Installing Power BI Desktop and Connecting to Data
- Overview of the Workflow in Power BI Desktop
- Introducing the Different Views of the Data Mode
- Query Editor Interface
- Working on Data Model

#### Assignments

- Create Bar charts
- Create Pie charts
- Create Tree maps
- Create Donut Charts
- Create Waterfall Diagrams
- Creating Table Calculations for Gender

#### Programming with Power BI

- Working with Time Series
- Understanding aggregation and granularity
- Filters and Slicers in Power BI Maps
- Scatterplots and BI Reports
- Connecting Dataset with Power BI  
Creating a Customer Segmentation Dashboard  
Analyzing the Customer Segmentation Dashboard

#### Tools covered



## Big Data & Sparks Analytics

### Module 5 (16 hours)

#### Introduction To Hadoop & Big Data

- Distributed Architecture - A Brief Overview. Understanding Big Data
- Introduction To Hadoop, Hadoop Architecture
- HDFS, Overview of MapReduce Framework
- Hadoop Master: Slave Architecture
- MapReduce Architecture
- Use cases of MapReduce

#### Hands-on

- Map reduce Use Case 1: Youtube data analysis
- Map reduce Use Case 2: Uber data analytics
- Spark RDD programming
- Spark SQL and Data frame programming

#### What is Spark

- Introduction to Spark RDD
- Introduction to Spark SQL and Data frames
- Using R-Spark for machine learning
- Hands-on:
- Installation and configuration of Spark
- Using R-Spark for machine learning programming

#### Tools covered





## Time Series

## Module 6 (14 hours)

### Introduction to Time Series Forecasting

- Basics of Time Series Analysis and Forecasting
- Method Selection in Forecasting
- Moving Average (MA) Forecast Example
- Different Components of Time Series Data
- Log Based Differencing, Linear Regression for Detrending

### Introduction to ARIMA Models

- ARIMA Model Calculations, Manual ARIMA Parameter Selection
- ARIMA with Explanatory Variables
- Understanding Multivariate Time Series and their Structure
- Checking for Stationarity and Differencing the MTS

### CASE STUDY

- Time series classification of smartphone data to predict user behavior
- Performing Time Series Analysis on Stock Prices
- Time series forecasting of sales data

Note: All the assignments and case studies will be covered in-depth with real-time examples

**Deep Learning Using Tensorflow****Module 1 (20 hours)****Introduction to Deep Learning And TensorFlow**

- Neural Network
- Understanding Neural Network Model
- Installing TensorFlow
- Simple Computation, Constants, and Variables
- Types of file formats in TensorFlow
- Creating A Graph – Graph Visualization
- Creating a Model – Logistic Regression
- Model Building using tensor flow

**Understanding Neural Networks With TensorFlow**

- Basic Neural Network
- Single Hidden Layer Model
- Multiple Hidden Layer Model
- Backpropagation – Learning Algorithm and visual representation
- Understand Backpropagation – Using Neural Network Example
- TensorBoard

**TensorFlow Classification Examples**

- Introduction to TensorFlow
- Installing TensorFlow
- Simple Computation, Contents and Variables
- Types of file formats in TensorFlow
- Creating A Graph - Graph Visualization
- Creating a Model - Logistic Regression Model Building
- TensorFlow Classification Examples

**Convolutional Neural Network (CNN)**

- Convolutional Layer Motivation
- Convolutional Layer Application
- The architecture of a CNN
- Pooling Layer Application
- Deep CNN
- Understanding and Visualizing a CNN

**Project**

- Building a CNN for Image Classification
- Project on backpropagation using Neural Networks with Tensor Flow

## Natural Language Processing

## Module 2 (24 hours)

### Natural Language Processing

- Text Analytics
- Introduction to NLP
- Use cases of NLP algorithms
- NLP Libraries
- Need for Textual Analytics
- Applications of NLP
- Word Frequency Algorithms for NLP
- Sentiment Analysis

### Important

- Applications of Levenshtein distance
- LCS(Longest Common Sequence )
- Problems and solutions, LCS Algorithms

### Use cases on NLP

- Sentiment analysis for marketing
- Toxic comments classification
- Language identification
- Generating research papers titles
- Application to translate and summarize the news
- RESTful API for similarity check

### Text Analysis

- Distance Algorithms used in Text Analytics
- String Similarity
- Cosine Similarity Mechanism -
- The similarity between two text documents
- Levenshtein distance - measuring the difference between two sequences

### KNN

- Information Retrieval Systems
- Information Retrieval - Precision, Recall, F- score TF-IDF
- KNN for document retrieval
- K-Means for document retrieval
- Clustering for document retrieval

**Deployment AWS+Azure****Module 3 (10 hours)****Introduction to AWS and Azure Machine Learning Services**

- Overview of AWS SageMaker and Azure Machine Learning
- Key features and benefits of using these platforms
- Understanding different types of machine learning algorithms and use cases

**Data Preparation and Feature Engineering**

- Understanding the data requirements for machine learning models (e.g. structured vs unstructured data, data size, data quality)
- Data cleaning and preprocessing techniques (e.g. missing value imputation, feature scaling, encoding categorical variables)
- Feature selection and engineering techniques (e.g. PCA, feature importance)

**Setting up the Environment**

- Creating AWS and Azure accounts
- Configuring the required tools and SDKs (e.g. AWS CLI, Azure CLI, Azure PowerShell)
- Understanding the infrastructure requirements for training and deploying models (e.g. EC2 instances, GPU instances, Azure ML Compute)

**Model Training and Evaluation**

- Choosing the right machine learning algorithm and model (e.g. regression, classification, clustering)
- Training models using AWS SageMaker and Azure Machine Learning (e.g. using built-in algorithms, custom code)
- Evaluating model performance and tuning hyperparameters (e.g. cross-validation, hyperparameter optimization)

## Deployment AWS+Azure

## Module 3 (10 hours)

### Model Deployment and Management

- Deploying trained models on AWS SageMaker and Azure Machine Learning (e.g. creating endpoints, batch inference)
- Monitoring model performance and managing versions (e.g. model drift, A/B testing)
- Integration with other services and applications (e.g. AWS Lambda, Azure Functions) techniques (e.g. PCA, feature importance)

### Advanced Topics in Machine Learning on AWS and Azure

- Deep learning techniques and architectures (e.g. neural networks, convolutional neural networks, recurrent neural networks)
- Natural Language Processing (NLP) use cases (e.g. text classification, sentiment analysis, language translation)
- Understanding the costs and pricing models for machine learning on AWS and Azure (e.g. instance pricing, storage pricing, model deployment pricing)

## AI Generative Tools and Future Trends



### Emerging Trends in AI and Generative Modeling

- Exploring other AI generative tools beyond [ChatGPT](#) and [DALL·E](#)
- Overview of Midjourney
- Discussion on future trends and advancements in AI generative tools
- Open-ended project and/or presentation on a selected topic, incorporating learned concepts

### Natural Language Processing and ChatGPT

- Introduction to natural language processing techniques
- Understanding ChatGPT and its architecture  
Hands-on exercises using ChatGPT for text generation
- [Fine-tuning ChatGPT for specific applications](#)



Midjourney



Bing



ChatGPT



DALL·E



Bard

### DALL·E: Image Generation with AI

Exploring image generation using DALL·E

- [Hands-on exercises for creating unique images with DALL·E](#)
- Ethical considerations and limitations of AI-generated images

### Graph Neural Networks (GNN) for Data Analysis

- Overview of [Graph Neural Networks \(GNN\)](#) and their applications
- Hands-on exercises using GNN for tasks such as node classification and link prediction
- Case studies on real-world applications of GNN in data science



## Python Bootcamp for AI

- Python Essentials: Syntax, Data Types, and
- Variables Flow Control: Conditionals and Loops

## Build Your Interview Assistant

- Project Overview: Interview Automation Bot
- Components & Architecture
- Natural Language Models (LLMs): Introduction and Uses

## Large Language Models (LLM)

- Historical Overview of NLP: From Rule-Based Systems to Machine Learning.
- Evolution of Neural Network Architectures in NLP.

## Visual AI for eCommerce

- Introduction: Digital Transformation for Offline Businesses
- Multimodal Models: DALL-E and Beyond
- Style & Photography Principles for Visual AI

## Intelligent News Aggregator

- Project Outline: Personalized News Recommendation
- GPT-3 & Copilot for Code Automation

## Customer Support Bot - HelpMate Pro

- Project Introduction and Components
- Embeddings vs Fine-Tuning: When and How
- Semantic Search in Customer Service

## Knowledge Discovery Bot

- Project Overview and
- Architecture LangChain Tools and Concepts

## Azure OpenAI Integration

- OpenAI on Azure: Services and Scalability
- Revisiting HelpMate Pro: Scaling Strategy

## The Future & Ethics of Generative AI

- Responsible AI: Bias and Fairness
- Future Trends: Multimodal Models and RLHF
- Closing Remarks
- Assessment: MCQ

## Capstone Project (3 Weeks)

- Building an Integrated Prompt Engineering Solution
- Project Submission and Peer Review



The **IBM** exam will be conducted for all the modules after completion of the course

# Real-time Projects

J.P.Morgan

13 hours

## Fraud Detection

Develop a fraud detection system that uses machine learning algorithms to identify potential fraud in financial transactions



AMERICAN EXPRESS

17 hours

## Risk Management

Develop a risk management system that uses predictive analytics to identify and assess risks in the financial sector.



citibank

21 hours

## Customer Segmentation

Develop a customer segmentation system that uses data analytics to segment customers based on demographics and financial behavior

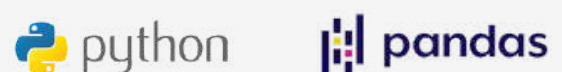


HSBC

15 hours

## Anti-Money Laundering

Develop an anti-money laundering system that uses predictive analytics to detect and prevent money laundering



# Real-time Projects

**WELLS FARGO**

13 hours

## Loan Origination

Develop a loan origination system that uses machine learning to automate the loan application process and determine creditworthiness.



**Goldman Sachs**

17 hours

## Trading Analytics

Develop a trading analytics system that uses big data analytics to analyze financial data and improve trading strategies



**BLACKROCK**

21 hours

## Portfolio Management

Develop a portfolio management system that uses data analytics to optimize investment portfolios and maximize returns.



**Morgan Stanley**

15 hours

## Regulatory Compliance

Develop a regulatory compliance system that uses data analytics to ensure compliance with financial regulations.



# Contact Us



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