THE DATALOGY

Empowering Minds With Future Tech

90 HOURS - 45 CLASSES - 16 WEEKS

DATA SCIENCE BOOT CAMP

PYTHON | OPEN AI | MACHINE LEARNING | DEEP LEARNING | NLP | LANGCHAIN | REST API | HUGGINGFACE

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PYTHON
PROGRAM OUTLINE
18 HOURS – 9 CLASSES – 3 WEEKS

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PROGRAM OUTLINE

Course Welcome and Setup

- Course Overview
- Python Overview
- Anaconda Distribution Installation
- Jupyter Notebook 101
- Jupyter Notebook – Adding Comments in Cells

OBJECTS, VARIABLES & DATA TYPES

- Objects and Variables Overview
- Numbers
- Strings
- String Operations
- String Methods and Properties
- String Concatenation and Formatting
- Lists
- Dictionaries
- Tuples and Sets
- Booleans

PROGRAM OUTLINE

CONTROL, FLOW & LOOPS

- Python Operators
- Control Flow
- For Loops
- For Loops (continued)
- While Loops
- Break, Continue and Pass Statements
- List Comprehension
- IN and NOT IN

FUNCTIONS

- Built-In Functions
- User Defined Functions
- User Defined Functions – Examples
- Arguments and Keyword Arguments
- Map and Filter
- Lambda Functions
- Errors and Exception Handling

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PROGRAM OUTLINE

PANDAS (DATA ANALYSIS & MANIPULATION)

- Pandas Overview
- Introduction to Series
- Introduction to DataFrames
- Selecting Data
- Selecting Data 2
- Data Manipulation 1
- Data Manipulation 2
- Data Aggregation and Grouping
- Data Cleansing
- Combining DataFrames
- Windowing Operations

Working with Dates and Times

- Date and Time Data Types and Operations
- Resampling and Time Series Analysis
- Date Functionality in Pandas

PROGRAM OUTLINE

CONNECTING TO DATA SOURCES

- Excel and CSV
- HTML
- Databases
- Pandas Input and Output Methods

MATPLOTLIB (DATA VISUALIZATION)

- Matplotlib Overview
- Choosing the Right Chart Type
- Creating a Plot Area 1
- Creating a Plot Area 2
- Bar Plots
- Line Plots
- Scatter Plots
- Histograms
- Box Plots and Violin Plots
- Style and Presentation
- Additional Resources and Cheat Sheets

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PROGRAM OUTLINE

SEABORN (STATICAL DATA VISUALIZATION)

- Seaborn Overview
- Categorical Plots
- Relational Plots
- Distribution Plots
- Regression Plots
- Matrix Plots
- Multi Plot Grids
- Style and Presentation

AUTOMATING EXCEL OPERATIONS

- Working with Excel files using Pandas and OpenPyXL
- Creating Excel Charts and Pivot Tables Programmatically
- Automating Data Extraction and Formatting
- Using XlsxWriter for Advanced Formatting

PROGRAM OUTLINE

WEB SCRAPPING & DATA COLLECTION

- Basics of Web Scraping with BeautifulSoup
- Automating web Data Collection using Requests and Selenium
- Data Storage and Preprocessing after Scraping

Automating Data Import/Export

- Reading and writing CSV, Excel, JSON, and SQL files
- Automating connections to databases using SQLAlchemy
- Exporting Data to different Formats

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MACHINE LEARNING

PROGRAM OUTLINE

24 HOURS – 12 CLASSES – 4 WEEKS

PROGRAM OUTLINE

File Handling & Debugging

- Reading and writing files
- Debugging techniques and error handling

Data Science Methodologies

- Data collection and exploration
- Data preprocessing and cleaning

Introduction to Machine Learning

- Supervised vs. Unsupervised learning
- Overview of ML algorithms

PROGRAM OUTLINE

Regression Models

- Linear regression
- Multiple and polynomial regression

Classification Techniques

- Logistic regression
- K-Nearest Neighbors (KNN)

Support Vector Machines & Decision Trees

- Support Vector Machines (SVM)
- Decision trees and random forests

PROGRAM OUTLINE

Clustering Techniques

- K-Means clustering
- Hierarchical clustering

Model Evaluation & Feature Engineering

- Model evaluation metrics
- Feature selection and engineering

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DEEP LEARNING

PROGRAM OUTLINE

24 HOURS – 12 CLASSES – 4 WEEKS

PROGRAM OUTLINE

Introduction to Neural Networks

- Understanding Artificial Neural Networks (ANN)
- Activation functions and backpropagation

Training Deep Learning Models

- Optimizers and loss functions
- Regularization techniques

Convolutional Neural Networks (CNNs)

- CNN architecture and applications
- Training CNNs and data augmentation

PROGRAM OUTLINE

Recurrent Neural Networks (RNNs)

- Sequence modeling and RNNs
- Long Short-Term Memory (LSTM) and Gated Recurrent Units (GRUs)

Introduction to Transformers

- Understanding the Transformer architecture
- Self-attention and positional encoding

Transfer Learning & YOLO

- Implementing pre-trained models
- Introduction to YOLO for object detection

PROGRAM OUTLINE

Natural Language Processing (NLP)

- Tokenization, embeddings, and text preprocessing
- NLP applications and sentiment analysis

Hugging Face & Pre-trained Models

- Working with Hugging Face library
- Using transformer-based pre-trained models

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GENERATIVE AI & CAPSTONE PROJECT

PROGRAM OUTLINE

24 HOURS – 12 CLASSES – 4 WEEKS

PROGRAM OUTLINE

Introduction to Generative AI

- Overview of generative models
- Applications in text and image generation

Retrieval-Augmented Generation (RAG) & LangChain

- Understanding RAG and its applications
- Introduction to LangChain for modular AI applications

PROGRAM OUTLINE

Building AI-Powered Chatbots

- Chatbot development using LangChain and LLMs
- Prompt engineering for optimized responses

Capstone Project - Building a Functional AI Chatbot

- End-to-end chatbot development
- Deploying the chatbot and final presentations

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