

Statistics

Week

February

Month

March

Year

April



THE DATALOGY
Empowering Minds With Future Tech

72 HOURS - 36 CLASSES - 12 WEEKS

GENERATIVE AI BOOT CAMP



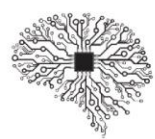
PYTHON



OPEN AI



**MACHINE
LEARNING**



**DEEP
LEARNING**



NLP



LANGCHAIN



**REST
API**



HUGGINGFACE



THE DATALOGY
Empowering Minds With Future Tech

PYTHON PROGRAM OUTLINE

18 HOURS – 9 CLASSES – 3 WEEKS





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





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





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

18 HOURS – 09 CLASSES – 3 WEEK



PROGRAM OUTLINE

Machine Learning Essentials

- Introduction to Machine Learning, Supervised vs Unsupervised Learning
- Learn the differences between supervised and unsupervised learning, and the fundamentals of Scikit-learn.
- Linear & Logistic Regression
- Introduction to regression algorithms for predicting continuous values (Linear Regression) and categorical values (Logistic Regression).
- Model Evaluation: Accuracy, Precision, Recall, Confusion Matrix
- Understand metrics for evaluating models, including accuracy, precision, recall, and confusion matrix.





PROGRAM OUTLINE

Machine Learning Essentials

- K-Nearest Neighbors (KNN) Algorithm
- Learn about the KNN algorithm for classification and regression tasks.
- Decision Trees and Random Forests
- Study decision trees and ensemble methods like Random Forest for classification tasks.
- Model Tuning and Cross-Validation
- Understand hyperparameter tuning, grid search, and cross-validation to improve model performance.



PROGRAM OUTLINE

Machine Learning Essentials

- K-Means Clustering Algorithm
- Learn about K-Means for unsupervised learning and clustering data points into groups.
- Dimensionality Reduction with PCA
- Introduction to Principal Component Analysis (PCA) to reduce data complexity.
- Naive Bayes Classifier
- Explore the Naive Bayes classifier for text classification and other applications.





PROGRAM OUTLINE

Machine Learning Essentials

- Model Selection and Hyperparameter Tuning
- Learn strategies for selecting the best model and fine-tuning hyperparameters.
- Day 23 (Saturday): Cross-Validation and Pipelines
- Understand the concept of cross-validation and how to streamline the machine learning pipeline.
- Day 24 (Sunday): Hands-On Machine Learning Project
- Complete a mini project using a real dataset and applying the learned ML techniques.



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DEEP LEARNING

PROGRAM OUTLINE

18 HOURS – 09 CLASSES – 3 WEEK





PROGRAM OUTLINE

Deep Learning Fundamentals

- Introduction to Neural Networks
- Learn the basics of neural networks, how they work, and how to implement them.
- Day 26 (Saturday): Activation Functions
- Understand activation functions like ReLU, sigmoid, and tanh.
- Day 27 (Sunday): Forward/Backward Propagation and Loss Functions
- Study the forward and backward propagation techniques, and learn how loss functions help train a network.



PROGRAM OUTLINE

Deep Learning Fundamentals

- Introduction to TensorFlow and Keras
- Introduction to TensorFlow, the popular deep learning framework, and Keras for building models.
- Building Simple Neural Networks with Keras
- Hands-on class where students build and train simple neural networks using Keras.
- Introduction to Convolutional Neural Networks (CNNs)
- Learn about CNNs, which are widely used for image recognition and processing.



PROGRAM OUTLINE

Deep Learning Fundamentals

- Recurrent Neural Networks (RNNs)
- Introduction to RNNs and their applications in time series forecasting and natural language processing.
- Long Short-Term Memory (LSTM) Networks
- Dive deeper into LSTMs, a specific type of RNN used for sequence prediction.
- Hands-On Deep Learning Project
- Apply deep learning techniques to build an image or text classification model.





PROGRAM OUTLINE

Deep Learning Fundamentals

- Transfer Learning and Fine-Tuning Pre-Trained Models
- Learn how to use pre-trained models and fine-tune them for specific tasks.
- Introduction to Generative AI Models
- Learn about generative models like GANs and autoencoders for creating new data.
- Deep Learning Project and Presentation
- Work on and present a deep learning project using the techniques learned.





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GENERATIVE AI

PROGRAM OUTLINE

18 HOURS – 09 CLASSES – 3 WEEK





PROGRAM OUTLINE

Generative AI

- Introduction to Generative AI
- Learn about the fundamentals of generative models, including GANs, VAEs, and transformers.
- Introduction to Text Generation (GPT, BERT)
- Study the basics of GPT and BERT models for natural language processing and text generation.
- Tools for Text Generation: OpenAI GPT-3
- Hands-on session with OpenAI's GPT-3 for generating human-like text.



PROGRAM OUTLINE

Generative AI

- Image Generation with Diffusion Models (DALL·E, Stable Diffusion)
- Learn how diffusion models work and how to generate images with tools like DALL·E and Stable Diffusion.
- Hands-On: Generating Images via Hugging Face and Stable Diffusion
- Create images with Stable Diffusion, using pre-trained models available on Hugging Face.
- Customizing Image Generation (Prompts & Parameters)
- Learn how to fine-tune prompts and adjust parameters to create unique and specific images.



PROGRAM OUTLINE

Generative AI

- Image Generation with Diffusion Models (DALL·E, Stable Diffusion)
- Music and Audio Generation with Magenta
- Introduction to Magenta, a tool by Google for generating music and audio using AI.
- Hands-On: Creating Music with Magenta
- Generate simple AI-created music tracks using Magenta.
- Advanced Music Generation and Final Project Preparation
- Experiment with advanced techniques in music generation and start planning your final project.



PROGRAM OUTLINE

Generative AI

- Final Project – Implementation & Refinement
- Work on implementing your final capstone project using the skills learned throughout the course.
- Final Project – Testing and Optimization
- Test, optimize, and refine your project based on feedback and evaluation.
- Final Project Showcase, Presentations & Certificate Distribution
- Present your final project, followed by a course recap and certificate distribution.



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