

Machine Learning Bootcamp Tech Neuron

Instructors:

krish naik:

Having 10+ years of experience in Data Science and Analytics with product architecture design and delivery. Worked in various product and service based Company. Having an experience of 5+ years in educating people and helping them to make a career transition.

Sunny Savita:

I'm an AI enthusiast, graduate in Computer science and engineering. Currently working with iNeuron.ai as a Data Scientist and having 2+ years of experience. I have skills in big data, machine learning, computer vision, Natural language processing. My expertise also includes project design development and implementation with AIOps tools.

Curriculum:

Course Introduction

- Introduction of Data Science, AI, ML, DL and its application in Day to Day life
- Course overview and Dashboard description

Installation and setup of the required software

- Installation and setup of Anaconda Distribution
- Installation and setup of Pycharm and VScode
- Complete walk-through of Jupyter Notebook in local
- Setup of Google Colab with GPU
- Create a virtual environment through anaconda and project setup

Introduction of Python

- Python Introduction and comparison with other Programming language
- Important Features of python
- Testing Python Installation with hello world
- Introduction To Predefined Functions And Modules
- How print() function works ?
- How To Remove Newline From print() ?
- Rules For Identifies, Python Reserved Words, Data Types In Python
- Operators Arithmetic, Bitwise, Comparison and Assignment operators, Operators Precedence and associativity
- Compound Operators, Identity Operators, Membership Operators

String

- What Is A String ?
- Creating A String
- Different Ways Of Accessing Strings
- Operators Which Work On Strings
- Built In String Functions
- Printing string using f-string
- Modifying Strings
- String conversion methods
- String comparison methods
- String searching methods
- String replace methods

List

- What Is A List ?
- Creating A List
- Accessing The List Elements
- Adding New Data In The List
- The Slice Operator With List
- Modifying A List
- Deletion In A List
- Appending / Prepending Items In A List
- Multipling A List
- Membership Operators On List
- Built In Functions For List
- Methods Of List
- List Comprehension

Tuples

- What Is A Tuple and how to create Tuple
- Differences between List and Tuples
- Benefits Of Tuple
- Packing / Unpacking A Tuple
- Accessing A Tuple
- Changing The Tuple
- Deleting The Tuple
- Functions Used With Tuple

- Methods Used With Tuple
- Operations Allowed On Tuple

Dictionaries and set

- What Is A Dictionary ?
- What Is Key-Value Pair ?
- Creating A Dictionary
- Important Characteristics Of A Dictionary
- Different Ways To Access A Dictionary
- Updating Elements In Dictionary
- Removing Elements From Dictionary
- Functions Used In Dictionary
- Dictionary Methods
- Set introduction
- Set methods

Decision Control Statements and loops in python

- if Statement
- Concept of Indentation
- if-else Statement
- if-elif-else Statement
- Types of loop supported by Python
- while loop
- while-else loop
- Break, continue and pass Statement

- for Loop
- for Loop In Python
- Differences with other languages
- range() Function
- Using for with range()

Python Functions

- What Is A Function ?
- Function V/s Method
- Steps Required For Developing User-Defined Function
- Calling A Function
- Returning Values From Function
- Arguments V/s Parameters
- Types Of Arguments
- Variable Scope
- Local Scope
- Global Scope
- Argument Passing
- Anonymous Functions OR Lambda Function
- The map() Function
- The filter() Function
- Using map() and filter() with Lambda Expressions
- Iterators Generator functions

OOPS Concepts

- Procedure Oriented Programming vs Object Oriented Programming
- What Is A Classes and Object ?
- `__init__()` Method
- Types Of variable in class
- Types Of Methods in class
- Difference Between local variable, class variable and Instance variable
- Difference Between Instance Method, Class Method and Static Methods
- concept of Encapsulation
- How To Declare Private Members In Python ?
- The `setattr()` And `getattr()` Functions
- object Class, `__repr__()` and `__str__()` methods
- concept of Inheritance
- Types Of Inheritance
- Single Inheritance
- Using `super()`
- Method Overriding
- MultiLevel Inheritance
- Hierarchical Inheritance
- Multiple Inheritance
- The MRO Algorithm
- Hybrid Inheritance
- The Diamond Problem
- Operator Overloading

Exception Handling

- Introduction To Exception Handling
- Exception Handling Keywords
- Exception Handling Syntax
- Handling Multiple Exceptions
- Handling All Exceptions

Python logging

- What is logging?
- When to use logging?
- Logging to a file
- Different level of logging
- Logging from multiple module
- Logging variable data
- Display Date&Time; in logging file

Working With Files

- Working with files
- Reading and writing files
- Buffered read and write
- Other File methods

Database

- What Is A Database ?
- Steps Needed For Connecting To mysql From Python
- Exploring Connection And Cursor Objects

- Executing The SQL Queries
- Different Ways Of Fetching The Data
- Executing INSERT Command
- Executing Update Command
- Executing Delete Command
- Introduction MongoDB
- What is Apache Atlas and features of Apache Atlas
- MongoDB atlas setup
- Querying the documents
- Finding, Inserting, Deleting & Updating elements
- Bulk insert operations
- Updating multiple document
- Understanding insertOne vs insertMany()
- Updateone() vs updateMany()
- Understanding find() & fetchall()
- Understanding "deleteOne()" & "deleteMany()"
- Filtering documents

API

- Flask Introduction
- Flask variable rules
- Flask templates and static files
- App Routing Flask
- URL Building Flask
- HTTP Methods Flask

- Flask requesting object
- Flask sending Form data to Template

Python Pandas Modules

- Pandas Series
- Pandas DataFrame
- Pandas Panel
- Pandas Basic functionality
- Pandas read csv
- Pandasread json
- Pandas reading data from mysql
- Pandas aggregations
- Pandas group by
- Pandas merging and joining
- Pandas concatenation operation
- Pandas date functionality
- Pandas .loc() and .iloc() function
- Pandas windows functions
- Pandas indexing and selecting data
- Cleaning data with pandas
- Working with missing data
- Working with categorical data

Python Numpy Modules

- NumPy Ndarray Object

- NumPy Data Types
- NumPy Array Attributes
- NumPy Array Creation Routines
- NumPy Array from Existing
- Data Array From Numerical Ranges
- NumPy Indexing & Slicing
- NumPy Advanced Indexing
- NumPy Broadcasting
- NumPy Iterating Over Array
- NumPy Array Manipulation
- NumPy Binary Operators
- NumPy String Functions
- NumPy Mathematical Functions
- NumPy Arithmetic Operations
- NumPy Statistical Functions
- Sort , Search & Counting Functions
- NumPy Byte Swapping
- NumPy Copies Views
- NumPy Matrix Library
- NumPy Linear Algebra

Python Visualization Modules

- Matplotlib Pyplot
- Matplotlib Plotting
- Matplotlib Subplot

- Matplotlib Line Chart
- Matplotlib Bar Chart
- Matplotlib Histogram Chart
- Matplotlib Pie chart
- Seaborn Histogram
- Seaborn Kernel density estimates
- Seaborn Facet grid
- Seaborn Pairgrid
- Seaborn Boxplot, violin plot and contour plot
- Seaborn Countplot
- Seaborn Heatmap
- Plotly Barchart histogram and pie chart
- Plotly scatter plot and Bubble chart
- Plotly distplot, density plot, and error bar plot
- Plotly Heatmap
- Plotly 3-D scatter plot and surface plot
- Plotly with pandas and cufflinks
- Plotly with matplotlib and chartstudio
- Visualizing pairwise relationship
- Finding statical estimation
- Finding linear relationship
- Finding correlation between variable

Statistics

- Introduction

- Different types of Statistics
- Population vs Sample
- Mean, Median and Mode
- Variance, Standard Deviation
- Sample Variance why $n-1$
- Standard Deviation
- Variables
- Random Variables
- Percentiles & quartiles
- 5 number summary
- Histograms
- Gaussian - Normal distribution
- Standard Normal distribution
- Application Of Zscore
- Basics Of Probability
- Addition Rule In Probability
- Multiplication rule in probability
- Permutation
- Combination
- Log Normal Distribution
- Central Limit theorem
- Statistics - Left Skewed And Right Skewed Distribution And Relation With Mean, Median And Mode
- Covariance
- Pearson And Spearman Rank Correlation

- What is P Value
- What is Confidence Intervals
- How To Perform Hypothesis Testing - Confidence Interval Z Test Statistics Derive Conclusion
- Hypothesis testing part 2
- Hypothesis testing part 3
- Finalizing statistics

Exploratory Data Analysis

- Feature Engineering and Selection
- Create a profile of the data
- Perform statistical analysis
- Building Tuning and Deploying Models
- Perform EDA with automated library
- Analyzing Bike Sharing Trends
- Analyzing Movie Reviews Sentiment
- Customer Segmentation and Effective Cross Selling
- Analyzing Wine Types and Quality
- Analyzing Music Trends and Recommendations
- Forecasting Stock and Commodity Prices

Machine Learning Module 1

- Introduction of machine learning
- Difference between Supervised, Unsupervised & Semi-supervised
- Linear Regression Mathematical Institution

- Linear Regression assumption.
- OLS
- Different Training methodology
- Train, Test, Validation Split
- Hands-on linear regression in python from scratch
- Complete hands-on with scikit learn
- Overfitting & Underfitting
- Ridge Regression
- Lasso Regression
- Elastic Net Regression
- Polynomial Regression
- Logistics regression
- Difference between Linear Regression and Logistic Regression
- Performance matrix
- Confusion matrix
- Precision, Recall, ROC, AUC Curve
- F-beta Score

Machine Learning Module 2

- SVR(support vector regressor)
- SVC(support vector classifier)
- SVM(Support vector machine)
- KNN Classifier
- KNN Regressor
- K Nearest Neighbour

- Lazy learners
- KNN Issues
- Performance measurement of KNN

Machine Learning Module 3

- Decision Tree Classifier
- Decision tree Regressor
- Cross Validation
- Bias vs Variance
- Ensemble approach
- Bagging
- Boosting
- Stacking
- Random Forest

Machine Learning Module 4

- Ada boosting
- Gradient boosting
- XGBoosting
- Hands-on XgBoost

Unsupervised Machine Learning

- Introduction to K-Means Clustering
- Hard K-Means clustering
- Soft K-Means clustering

- Visualizing Each Step of K-Means
- How to Choose K value
- Advantages and Disadvantages of K-Means Clustering
- Examples of where K-Means can fail
- How to Evaluate a Clustering algorithm
- Silhouette Coefficient
- Dunn's Index
- Python implementation using K-Means on Real Data
- Real-time Clustering Application
- Visual Walkthrough of Agglomerative Hierarchical Clustering
- Using Hierarchical Clustering in Python and Interpreting the Dendrogram
- python implementation of Agglomerative Clustering
- DBSCAN: A Density-Based Clustering Algorithm
- How to use DBSCAN: A Density-Based Clustering Algorithm for outlier detection
- Python implementation of DBSCAN

Dimension Reduction Techniques

- Principal Component Analysis (PCA)
- T-distributed Stochastic Neighbor Embedding(t-SNE)
- Curse of Dimensionality

Natural Language Processing

- Text Analytics
- Tokenizing, Chunking
- Document term

- Matrix TFIDF
- Sentiment analysis hands-on
- Naive Bayes classifier

Deep Learning

- Deep Learning Introduction.
- Neural Network Architecture.
- Loss Function.
- Cost Function.
- Optimizers.
- CNN architecture.
- Build First Classifier in CNN.
- Deploy Classifier over cloud.
- RNN overview.
- GRU.
- LSTM.
- Time Series using RNN LSTM.
- Customer Feedback analysis using RNN LSTM.

Time series

- Arima
- Sarima .
- Auto Arima
- Time series using RNN LSTM .
- Prediction of NIFTY stock price.

Machine Learning Deployment

- Deployment of all the project in Cloudfoundary, AWS, AZURE & Google Cloud Platform
- Expose api to web browser and mobile application retraining approach of Machine learning model
- Devops infrastructure for machine learning model
- Database integration and scheduling of machine learning model and retraining custom machine learning training approach.
- AUTO ML
- Discussion on infra cost and data volume
- Prediction based on streaming data

Machine Learning Extra Sessions

- Discussion on project explanation in interview
- Data scientist roles and responsibilities
- Data scientist day to day work
- Companies which hire a data scientist
- Resume discussion with our team one to one