

# Machine Learning Bootcamp Tech Neuron

In this Machine Learning Bootcamp you will learn technologies like Python, API, database, statistics, ML algorithms, deployment of ML models in various cloud platforms, and all machine learning algorithms. You will also learn about chatbots like Dialogflow, Amazon Lex, Azure Luis & RASA NLU. 15+ live projects are included to make your journey interesting from Zero to ML Engineer.

Duration : 4 - 5 months    Language : english    Price : 25000

## What you will learn?

- Python
- APIs
- Databases
- Python projects
- Numpy
- Pandas
- Visualizations
- Stats
- Supervised Machine learning Algorithms
- Unsupervised Machine learning Algorithms
- Dimensionality Reduction
- Machine Learning Projects
- Deep learning
- PowerBI
- Tableau
- Chatbots

## Features

- Machine Learning in Depth
- CI/CD pipeline for ML
- End to End Model Deployment in Azure, GCP & AWS
- Time Series end-to-end implementation in ML
- 20 + hands-on industry real-time projects
- Power BI and Tableau self-placed course
- 150+ hours live interactive classes
- Doubt clearing session after the live classes
- Doubt clearing one-to-one

- Doubt clearing through mail and support team
- Assignment in all the modules
- 20+ use cases of Machine learning
- Live project with real-time implementation
- Online Instructor-led learning

## **Requirements**

- Dedication
- Laptop with internet connectivity

## **Course 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
- Multiplied 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 Narray 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 statical 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