Machine Learning Bootcamp

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 languages

• 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

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

• Multiplying 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 modules

• 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 MongoDB Atlas and features MongoDB 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

- Matplotib 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 IntervalZ 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 the 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 projects in AWS AZURE, and GCP

• Expose api to a 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 interviews

• 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

Python Projects

• Web Crawlers for Image Data, Product Review Sentiment Analysis

• Integration with FrontEnd

• Integration with Rest APIs with Web Apps and MongoDB

• Deployment on Web Apps on Azure

• Text Mining

• Social Media Data Churn

Machine Learning Projects

• Healthcare Analytics Prediction of medicines based on FITBIT band

• Revenue Forecasting for Startups

• Prediction of order cancellation at the time of ordering inventories

• Anomaly detection in inventory packaged material.

• Fault detection in wafers based on sensors data

• Demand forecasting for FMCG product.

• Threat Identification in Security Systems

• Defect detection in vehicle engine.

• Food price forecasting with Zomato dataset.

• Cement Strength regression

• Credit Card Fraud

• Forest Cover Classification

• Income Prediction

• Mushroom Classifier

• Phising Classifier

• Thyroid Detection