DATA SCIENCE

Machine Learning For All With Python

Course Outline

Instructor

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Benefits

Have a look ->

- Teach Basic Python & Strongly Focus on Mathematics and Statistics Behind Machine Learning Algorithms.
- Work With Real Data & Implement With Python.
- Daily Assignment for Students & Live Projects.
- Facebook Group to Discuss Any Topic Related to The Course or DATA SCIENCE.
- After Completing the Course, We Will Provide You the Certificate.
- Life-time Support For All Students.

Module: 01	
Class 01	Important Discussion on: ▪ What is Data Science? ▪ What is Machine Learning? ▪ Data Science Venn Diagram. ▪ Differences between Data Science, Machine Learning and Deep Learning. ▪ Why Python for Data Science. ▪ Python vs R. ▪ Future of Data Science. ▪ Why Machine Learning so popular? ▪ Types of Learning in ML. ▪ Supervised Learning. ▪ Unsupervised Learning. ▪ Supervised vs Unsupervised. ▪ All about ML Algorithms. ▪ Data Science Job Market.
Class 02	Software Installation: ▪ Python ▪ Jupyter Notebook Basic Python: ▪ Input / Output Functions ▪ Variables Data Structures: - ▪ Python Data Structures ▪ Lists ▪ Tuples

Module: 02	
Class 03	Data Structures: – ▪ Sets ▪ Dictionaries ▪ Data Frame Loop & Condition: • Loops (for, while) • Python Conditions (if,elif,else) Discussion on Important Libraries: – ▪ NumPy ▪ Pandas ▪ Vaex ▪ Matplotlib ▪ Seaborn ▪ Scikit Learn ▪ Keras ▪ Tensorflow ▪ Pytorch

Class 04	All About Single Variable Linear Regression: (Class – 1) ▪ What is Linear Regression? ▪ Uses of Linear Regression in Real Life. ▪ Straight Line ▪ Curve Line ▪ Slope ▪ Intercept ▪ Math: In Depth Intuition of Linear Regression ▪ Cost Function ▪ Lose Function ▪ Mean Absolute Error (MAE) ▪ Mean Squared Error (MSE) ▪ Minimizing the Cost: Gradient Decent Algorithm ▪ Create Data Set in CSV Format ▪ Analysis Data with Matplotlib ▪ Implement Single Variable Linear Regression with Python and Real Dataset ▪ Future Value Prediction ▪ Assignment (Real Data Set)

Module: 03	
Class 05	Feature Engineering: (Class – 01) ▪ Different Types of Variables ▪ Work with Categorical Variables ▪ Measure of Central Tendency- ▪ Mean ▪ Median ▪ Mode ▪ Theory of One Hot Encoding ▪ One Hot Encoding with Python ▪ Theory of Label Encoding ▪ Label Encoding with Python ▪ Theory of Ordinal Encoding ▪ Ordinal Encoding with Python ▪ Mean or Target Encoding ▪ Mean or Target Encoding with Python ▪ Assignment (Real Data Set)
	Feature Engineering: (Class – 02) • What is Feature Scaling? • Techniques of Feature Scaling in Machine Learning

Class 06	• Theory of Normalization • Normalization with Python • Standardization • Standardization with Python • Theory of Robust Scaler • Robust Scaler with Python • Theory of Logarithmic Transformation • Logarithmic Transformation with Python • Theory of Reciprocal Transformation • Reciprocal Transformation with Python • Assignment (Real Data Set)

Module: 04	
Class 07	All About Multiple Variable Linear Regression: (Class – 2) ▪ Math Behind Multiple Variable Linear Regression ▪ Handle Missing Values with Python (Mean & Median) ▪ Implement Multiple Variable Linear Regression with Python and Real Dataset ▪ What is R Squared Value ▪ Implement R Square with Python

	▪ Simple ML Project: Future Profit Prediction Based on Previous Data ▪ Introduction to Kaggle.com & How to Download and Use Data Set from Kaggle.com ▪ Assignment (Real Data Set)
Class 08	Introduction to Classification Algorithms & All about Decision Tree: • Basic Logarithmic Operations. • All about Tree. • What is Decision Tree Algorithm? • What is Entropy in Decision Tree? • What is Information Gain? • What is Gini Index? • In Depth Mathematics Behind Decision Tree. • Implementation of Decision Tree with Python. • Visualize and Download Tree. • Assignment (Real Data Set)

Module: 05	
Class 09	Result Analysis: • Theory of Confusion Matrix. • Confusion Matrix with Python. • Accuracy. • Precision. • Recall. • F1-Measure. • Specificity. • AUC Curve. • ROC Curve. • Assignment (Real Data Set).
Class 10	All about Ensemble Algorithms: • What are Ensemble Techniques in Machine Learning? • Types of Ensemble Techniques. • Theory of Random Forest. • In Depth Mathematics Behind Random Forest. • Random Forest with Python. • Decision Tree Vs Random Forest.

	• Simple ML Project: Customer Churn Prediction with Python & ML. • Assignment (Real Data Set).

Module: 06	
Class 11	Logistic Regression: • What is Logistic Regression? • What is Sigmoid Function? • In Depth Mathematics Behind Logistics Regression Algorithm. • Logistic Regression with Python • Linear Regression Vs Logistic Regression • Simple ML Project: Heart Attack Prediction with Python & ML • Assignment (Real Data Set)

Class 12	Feature Engineering: (Class – 03) • What is Feature Selection in Machine Learning? • Theory of Principle Component Analysis. • Principle Component Analysis with Python. • Different Types of Feature Selection Methods. • Theory of Chi Square Test. • Chi Square Test with Python. • Select KBest. • Select kBest with Python. • Correlation Matrix. • Correlation Matrix with Heatmap. • Assignment (Real Data Set).

Module: 07	
Class 13	Feature Engineering: (Class – 04) • What is Feature Extraction Techniques? • Bag of Words Model in NLP. • What is Count Vectorizer? • Count Vectorizer with Python. • What is Tfidf Vectorizer?

	• Tfidf Vectorizer with Python. • What is Hashing Vectorizer? • Hashing Vectorizer with Python. • What is Word2vec? • Word2vec with Python. • Countvectorizer vs Tfidfvectorizer vs Hashing • Uses of Vectorizer in NLP. • Use of Natural Language Toolkit in NLP (NLTK) • Assignment (Real Data Set)
Class 14	Important Statistical Analysis: • Hypothesis Testing (Type 1 & Type 2 Error. • What is Analysis of Variance (ANOVA)? • Example of ANOVA Test. • What is T-Test? • Example of T Test. • ANOVA Vs T-Test. • P Value, T-test, ANOVA When to Use What, Implementation with Python. • Z Score Statistics. • All About Correlation Analysis. • Normal Distribution.

Module: 08	
Class 15	All about Cross Validation: • What is Cross Validation in Machine Learning? • Cross Validation Techniques. • Theory of K Fold Cross Validation. • Hold Out Cross Validation • K-Fold Cross Validation • Leave One-Out Cross Validation (LOOCV) • Stratified K Fold Cross Validation • Train Test Split Vs K Fold CV. • Assignment (Real Data Set).
Class 16	All about K-Nearest Neighbors: ▪ What is KNN Algorithm? ▪ Euclidean Distance Formula. ▪ KNN for Classification. ▪ KNN for Regression. ▪ In Depth Mathematics Behind K-Nearest Neighbors (KNN) Algorithm. ▪ KNN-Regressor vs KNN-Classifier. ▪ Implementing KNN with Python ▪ Assignment (Real Data Set)

Module: 09	
Class 17	All about Naïve Bayes: • What is Bayes Theorem? • Statistics & Probability • Statistics & Probability with Python • Naïve Bayes Algorithm • Naïve Bayes Algorithm with Python • Naïve Bayes for Text Classification • Gaussian NB, Bernoulli NB, MultiNomial NB • Simple ML Project: Spam Comments Classification with Python • Assignment (Real Data Set)
Class 18	All about Support Vector Machine: • Theory of Support Vector Machine (SVM) in Machine Learning. • Hyperplanes and Support Vectors. • Math Behind SVM. • SVM Implementation with Python. • Assignment (Real Data Set)

Module: 10	
Class 19	Cluster Algorithms: • What is Unsupervised Learning? • Types of Clusters. • Theory of K-Means Cluster Algorithm. • Single & Multiple Variable Cluster. • K-Means Cluster with Python. • Hierarchical Clustering. • Optimal Number of Cluster Selection. • Elbow Method. • Elbow Method with Python. • Simple ML Project: Market Basket Analysis. • Assignment (Real Data Set)
Class 20	Neural Network: • All about Neural Network • Tensorflow vs Pytorch • What is Deep Learning? • Types of Neural Network • What is Neuron? • Human Brain Vs Artificial Neuron

	• Single Layer Perceptron • Multiple Layer Perceptron • How ANN Works?

Module 11	
Last Class 21 (Guidelines)	Guidelines: • Scope of Higher Studies in Data Science. • Guide to be a Good Programmer. • Sharing Experience for Data Science Journey. • Machine Learning for Future Research. • R for Data Science. • Kaggle Competitions. • ML Jobs, Resume & Salary. • ML Interview Questions 2021.