CODING NINJAS

Jamboree™

Data Science and Machine Learning

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Overview

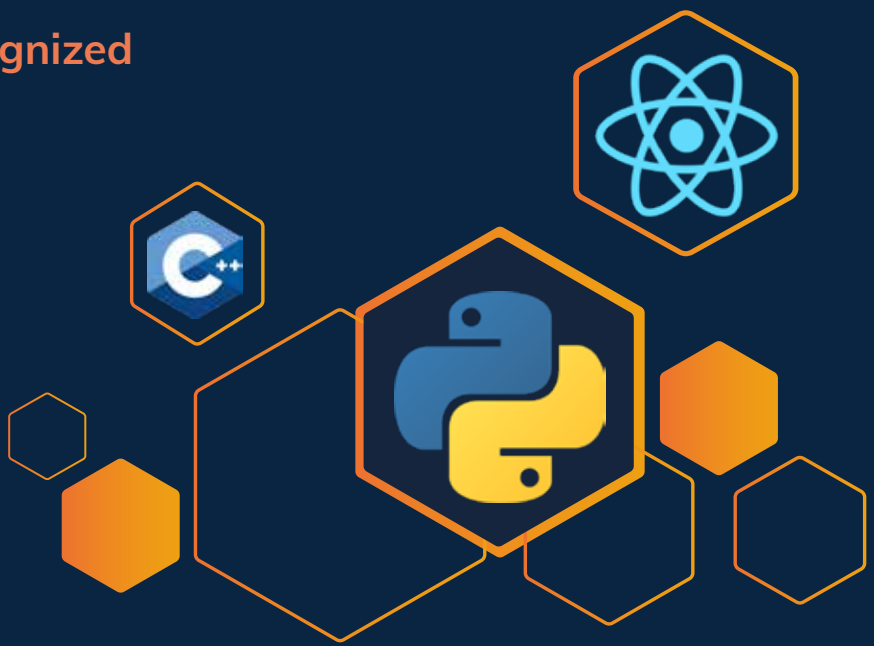
Data Science is all about extracting meaningful insights from gigabytes of data. This course will help you learn and understand the concepts of Python, Machine Learning, Data Cleaning and Data Analysis. You will be working on several projects as part of this course that you may add to your CV to get those coveted shortlists for desired roles, once you go abroad.

Highlights:

70+ hours of learning content and 55+ assignments

6 months duration and 9 months validity

11 industry-recognized projects



Pre-requisites:

Good knowledge of programming fundamentals and their implementation

Course Outcome:

This course will make you eligible for the job roles like Data Scientist, Data Engineer,Machine Learning Engineer, NLP Scientist, Software Developer/Engineer (AI/ML).

Key Highlights:

Mentor Support

Course Pause Feature

Certificate of Completion

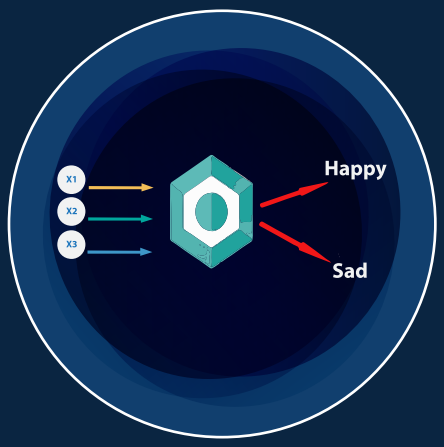
Course Extension

Projects you'll build:

Gradient Descent Implementation

Implement the standard Gradient Descent algorithm for optimisation of a model **(Regression or Neural).**

Libraries used: Numpy, Pandas, Matplotlib
Topics: Regression



Logistic Regression Implementation

Implement the standard Logistic Regression model generally used for classifying data into binary classes such as pass/fail, win/lose, alive/dead or healthy/sick.

Libraries used: Numpy, Pandas
Topics: Classification

Decision Tree Implementation

Implement the standard Decision Tree Class used for classifying data into various classes using a tree-like model of decisions and their possible consequences.

Libraries used: Numpy, Pandas, GraphViz, PyDotPlus
Topics: Classification

Text Classification

Build a classifier model using Naive Bayes algorithm to predict the topic of an article present in a newspaper

Libraries used: Numpy, Pandas, NLTK, Matplotlib
Topics: Naive Bayes

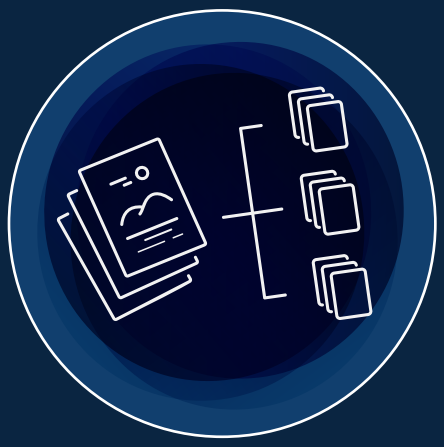


Image Classification (CIFAR-10 Dataset)

Build a classifier for classifying 10,000 images into 10 classes (dog, horse, cat etc) using the CIFAR-10 Dataset.

Libraries used: Numpy, Pandas, Sklearn, Matplotlib
Topics: SVM, PCA

Twitter Sentiment Analysis

Analyse the tweets posted on twitter to predict the sentiment of the tweet i.e. positive, negative or neutral

Libraries used: Numpy, Pandas, NLP, Sklearn
Topics: NLP

Facial Emotion Recognition

Build an advanced model with the ability to predict the facial emotion of a person in an image.

Libraries used: Numpy, Pandas, Keras, TensorFlow
Topics: Neural Networks

Distracted Driver Detection

Build a classification model to predict using a database of images whether a given driver is distracted, ie, texting, on a call, driving safely etc.

Libraries used: Numpy, Pandas, Keras, TensorFlow
Topics: Neural Networks

Text Generation

Build a Neural Network based model to predict what the next word will be in a sequence of words/sentences.

Libraries used: Numpy, Pandas, Keras, TensorFlow
Topics: Neural Networks, RNN, LSTM, GRU

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Neural Machine Translation

Build an advanced model for the purpose of translation of phrases and symbols from one language to the other using Artificial Neural Network.

Libraries used: Numpy, Pandas, Keras, TensorFlow
Topics: Neural Networks, RNN, LSTM

Urban Sound Classification

Build a Neural network based model to classify various sounds using their unique spectrogram into classes such as Dog Barking, Sirens, Street Music etc.

Libraries used: Numpy, Pandas, Keras, TensorFlow
Topics: Neural Networks

Image Caption Generation

Build a CNN/LSTM based model to provide a caption to the given image.

Libraries used: Numpy, Pandas, Keras, TensorFlow
Topics: Neural Networks, RNN, LSTM

Case Study on Indian Startups

Detailed analysis of the Indian Startups for interpretation of trends and patterns to facilitate selection of proper city, useful investors, funding type etc for different startups.

Libraries used: Numpy, Pandas, Matplotlib

TMDB API

Finding out the latest information about TV Shows, Movies and the biggest names in the entertainment sector for a marvelous and fun TV/Movie watching experience.

Libraries used: Numpy, Pandas, Matplotlib
Topics: Application Programming Interfaces(APIs)

Instagram Bot

Automation of your Instagram features such as like-unlike, follow-unfollow, and much more with a simple click of a button, achieved using libraries such as BeautifulSoup and Selenium.

Libraries used: Numpy, Pandas, Matplotlib, Selenium
Topics: Web Scraping

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Tools and techniques you'll learn:

DATA SCIENCE

TOPIC	SUB-TOPICS	DETAILS
INTRODUCTION	Introduction To Data Science	What is Data Science? Work of Data Scientist, Data Science and ML, Why Python
	Introduction To Python	First Program in Python, Anaconda and Jupyter Notebook, Variables in Python, Data Types, Python Numbers, Limit of Integers, Arithmetic Operators, Taking Inputs
CONDITIONAL STATEMENTS AND LOOPS	Conditionals and Loops	Boolean Datatype, Introduction to If-Else, Using Relational and Logical Operators, Using Else If, Nested Conditionals, While Loop, Primality Checking, Nested Loops
	Patterns	Introduction to Patterns, First Patterns, Square Patterns, Triangular Patterns, Character Patterns, Inverted Pattern, Reversed Pattern, Isosceles Pattern

TOPIC	SUB-TOPICS	DETAILS
CONDITIONAL STATEMENTS AND LOOPS	More on Loops	For loop & Range Method, Print Multiples of 3, Check if a Number is Prime, Pattern, Break Keyword, Else keyword with loops, Continue keyword, Pass statements
PROGRAMMING BASICS	Functions	Functions and how to use them, Why do we need functions, How does function calling works, Functions using strings & lists, Swap Alternate, Scope of Variables, Default parameters in functions
	Object-Oriented Programming Systems (OOPs)	Introduction, Create class & object, Instance Attributes, Class Attributes, Methods, Instance Methods, Constructors, Access modifiers, Class Methods & Static Methods

TOPIC	SUB-TOPICS	DETAILS
DATA TYPES	Strings, List & 2D List	Strings Introduction, Strings inbuilt functions, Strings slicing, Lists Introduction, List inbuilt functions, Taking Input, Difference of Even-Odd, List Slicing, Multi-dimensional Lists
	Tuples, Dictionary, and Sets	Tuples, Tuples Functions, Variable-length input and output, Dictionary Intro, Access/looping elements in dictionary, Adding Or Removing Data In Dictionary, Print All Words With Frequency K, Sets Intro, Functions in sets, Sum Of All Unique Numbers In List
	Working With Files	Introduction, Open and read Text files, Read file line by line, CSV Files, Work with CSV Files, DictReader, Countrywise Killed

TOPIC	SUB-TOPICS	DETAILS
DATA MANIPULATION	NumPy	Introduction, Why NumPy is fast, Create NumPy arrays, Slicing & Indexing, Mathematical Operations - 1D, Boolean Indexing - 1D, Boolean Indexing - 2D, NumPy Broadcastin
	Pandas	Introduction to Pandas, Accessing Data in Pandas, Manipulating Data in Data Frame, Handling NAN, Handling Strings in Data
	Matplotlib	Plotting Graphs, Customizing Graph, Bubble Chart, Pie Chart, Histogram, Bar Graph, How to decide Graph Type

TOPIC	SUB-TOPICS	DETAILS
STRUCTURED QUERY LANGUAGE [SQL]	Introduction to SQL queries	Create and Insert, Update Table, Retrieve Data, Filter Result, Aggregate Functions, Update and Delete, Introduction to Databases, Relational Database, What is SQL
	Advanced SQL queries	Group By, Having, Order By, IN, BETWEEN, LIKE, Joins Introduction, Inner Join, Left & Right Join
	Indexing And SQLite	What is Indexing, Default Indexing, Use Default Indexing, Add & Remove Indexes, SQLite Introduction, Connect with a database, Passing parameters in a query, Fetch data, SQLite with pandas

TOPIC	SUB-TOPICS	DETAILS
APPLICATION PROGRAMMING INTERFACE[API]	Introduction to API	Introduction to APIs, Examples of APIs, HTTP Basics, HTTP Libraries, JSON file format, JSON to Python, Explore JSON data, Passing Parameters - 1, POST request
	Working with API	Basic Authentication, Reddit Introduction, oAuth Introduction, oAuth Roles & Process, Reddit API - Get Access Token, Reddit API - Fetch Data, Reddit API - Few more operations
WEB SCRAPING	BeautifulSoup	Scraping Introduction, HTML tour, BeautifulSoup Introduction, Navigating Parse Tree, First Web Page, Books to scrape, Link of all the pages, Store data in CSV
	Selenium	Selenium Introduction, Let's start with Selenium, Browser Interaction, Locate element - 1, Web element Methods & Properties, Find all jobs, Type into fields

TOPIC	SUB-TOPICS	DETAILS
WEB SCRAPING	Advanced Selenium	Implicit Wait, Explicit Wait, Radio buttons and checkbox, Handle drop-down,Infinitely Scroll Webpage, Infinite Scrolling, Switch tab focus, Handle popups
DATA VISUALIZATION	Introduction to Data Visualization	Different ways for Data Visualization, Types Of Data Visualization, What is Data Visualization?, Importance Of Data Visualization
	Introduction to Tableau	Automatically Generated Fields, Dimension & measure, Tableau Navigation, Data Joins and Union, Connect with Data, Tableau Installation, What is Tableau, Data Types
	Tableau Visualizations	Histogram, Bar Chart, Area Chart, Adding customization, Let's create the First plot, Understanding the Basics of Plotting, Types of charts, Line Chart

TOPIC	SUB-TOPICS	DETAILS
DATA VISUALIZATION	Seaborn	Seaborn vs Matplotlib, Introduction to Seaborn, Starting with Seaborn, Visualizing Statistical Relationships - LinePlot
STATISTICS	Statistics	Introduction of Statistics, Data Types in Statistics, Sample & Population, Simple Random Sampling, Stratified sampling, Cluster sampling, Systematic Sampling, Categories of Statistics
	Descriptive Statistics	Measures in Descriptive Statistics, Measures of central tendency, Measures of Spread, Range & IQR, Variance & Standard Deviation, Measure of Position
	Introduction to Inferential Statistics	Introduction to Inferential Statistics, Why Inferential Statistics?, Probability Distribution, Normal Distribution, Standard Normal Distribution, Sampling Distribution, Central Limit Theorem

TOPIC	SUB-TOPICS	DETAILS
STATISTICS	Hypothesis Testing	What is Hypothesis Testing, Null & Alternative Hypothesis, Significance Level, Test statistic, Test Statistic: Critical value & Rejection Region, Test Statistic: Type of Test, Errors in Hypothesis Testing

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MACHINE LEARNING

TOPIC	SUB-TOPICS	DETAILS
INTRODUCTION	Introduction to Machine Learning	Introduction to Machine Learning, Supervised Learning, Steps for Supervised learning Loading Boston Dataset, Training an Algorithm,
PYTHON BASICS	Introduction to Python	First Program in Python, Anaconda and Jupyter Notebook, Variables in Python
	Strings	Strings,How Strings are stored,Operations on Strings,String Slicing,
	Tuples	Tuples,Tuples functions
PROGRAMMING BASICS	Conditionals and Loops	Boolean opertors, Conditions,Loops,Fast Iterations
	Functions	Functions, Variable Sized Input and Output

TOPIC	SUB-TOPICS	DETAILS
DATA TYPES	Lists	Introduction to Lists, Operations on Lists, Resizing of Lists, Looping on Lists, Negative Indexing and Sequencing in Lists ,Line Separated Input ,Space Separated Input
	Dictionaries	Intro to Dictionaries, Accessing Data in Dictionary, Adding/ Removing Data in Dictionary
	2D Lists	2D Lists and Wave Print
DATA MANIPULATION	Numpy	Importing Modules, Numpy, Numpy Operations
	Pandas	Introduction to Pandas, Accessing Data in Pandas, Manipulating Data in Data Frame, Handling NAN, Handling Strings in Data
	Plotting Graphs	Plotting Graphs, Customising Graphs, Pie Graph

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TOPIC	SUB-TOPICS	DETAILS
LINEAR AND LOGISTIC REGRESSION	Introduction to Linear Regression	Introduction to Linear Regression, Optimal Coefficients, Cost function, Coefficient of Determination, Analysis of Linear Regression using dummy Data, Linear Regression Intuition
	Multivariable Regression and Gradient Descent	Generic Gradient Descent, Learning Rate, Complexity Analysis of Normal Equation Linear Regression, How to find More Complex Boundaries, Variations of Gradient Descent
	Project: Gradient Descent	Implement the standard Gradient Descent algorithm for optimisation of a model (Regression or Neural).
	Logistic Regression	Handling Classification Problems, Logistic Regression, Cost Function, Finding Optimal Values, Solving Derivatives, Multiclass Logistic Regression, Finding Complex Boundaries and Regularization, Using Logistic Regression from Sklearn

TOPIC	SUB-TOPICS	DETAILS
DECISION TREES AND RANDOM FORESTS	Decision Trees - 1	Decision Trees, Decision Trees for Interview call, Building Decision Trees, Getting to Best Decision Tree, Deciding Feature to Split on, Continuous Valued Features
	Decision Trees - 2	Code using Sklearn decision tree, information gain, Gain Ratio, Gini Index, Decision Trees & Overfitting, Pruning
	Project: Decision Tree Implementation	Implement the standard Decision Tree Class used for classifying data into various classes using a tree-like model of decisions and their possible consequences.
	Random Forests	Introduction to Random Forests, Data Bagging and Feature Selection, Extra Trees, Regression using decision Trees and Random Forest, Random Forest in Sklearn

TOPIC	SUB-TOPICS	DETAILS
NAIVE BAYES	Naive Bayes	Bayes Theorem, Independence Assumption in Naive Bayes, Probability estimation for Discrete Values Features, How to handle zero probabilities, Implementation of Naive Bayes, Finding the probability for continuous valued features, Text Classification using Naive Bayes
	Project: Text Classification	Build a classifier model using Naive Bayes algorithm to predict the topic of an article present in a newspaper
KNN AND SVM	K-nearest neighbours	Introduction to KNN, Feature scaling before KNN, KNN in Sklearn, Cross Validation, Finding Optimal K, Implement KNN, Curse of Dimensionality, Handling Categorical Data, Pros & Cons of KNN

TOPIC	SUB-TOPICS	DETAILS
KNN AND SVM	Support Vector Machine	Intuition behind SVM, SVM Cost Function, Decision Boundary & the C parameter, using SVM from Sklearn, Finding Non Linear Decision Boundary, Choosing Landmark Points, Similarity Functions, How to move to new dimensions, Multi-class Classification, Using Sklearn SVM on Iris, Choosing Parameters using Grid Search, Using Support Vectors to Regression
PRINCIPAL COMPONENT ANALYSIS	PCA - 1	Intuition behind PCA, Applying PCA to 2D data, Applying PCA on 3D data, Math behind PCA, Finding Optimal Number of Features, Magic behind PCA
	PCA - 2	PCA on Images, PCA on Olevitti Images,Reproducing Images, Eigenfaces, Classification of LFW Images

TOPIC	SUB-TOPICS	DETAILS
PRINCIPAL COMPONENT ANALYSIS	Project: Cifar10	Build a classifier for classifying 10,000 images into 10 classes dog, horse, cat etc) using the CIFAR-10 Dataset.
NATURAL LANGUAGE PROCESSING	NLP - 1	Using Words as Features, Basics of word process-ing, Stemming, Part of Speech, Lemmatization, Building Feature set, Classification using NLTK Naive Bayes
	NLP - 2	Using Sklearn classifiers within NLTK, Countvectorizer, Sklearn Classifiers, N-gram, TF-IDF
	Project: Twitter Sentiment Analysis	Analyse the tweets posted on twitter to predict the sentiment of the tweet i.e. positive, negative or neutral

TOPIC	SUB-TOPICS	DETAILS
NEURAL NETWORKS	Neural Networks - 1	Why do we need Neural Networks, Example with Linear Decision Boundary, Finding Non-Linear Decision Boundary, Neural Network Terminology, No of Parameters in Neural Network, Forward and Backward Propagation, Cost Function, How to handle Multiclass classification, MLP classifier in sklearn
	Neural Networks - 2	Forward Propagation, Error Function in Gradient descent, Derivative of Sigmoid Function, Math behind Backpropagation, Implementing a simple Neural Network, Optimising the code using Vector Operations, Implementing a general Neural Network.
TENSORFLOW AND KERAS	TensorFlow	Introduction to Tensor-Flow, Constants, Session, Variables, Placeholder, MNIST Data, Initialising Weights and Biases, For-ward Propagation, Cost Function, Running the Optimiser, How does the Optimiser work?, Running Multiple Iterations, Batch Gradient Descent

TOPIC	SUB-TOPICS	DETAILS
TENSORFLOW AND KERAS	Keras	Introduction to Keras, Flow of code in Keras, Kera Models, Layers, Compiling the model, Fitting Training Data in Keras, Evaluations & Predictions
CONVOLUTIONAL NEURAL NETWORK	CNN - 1	Problem in Handling images, Convolution Neural Neworks, Stride and Padding, Channels, Pooling Layer, Data Flow in CNN
	CNN - 2	Architecture of CNN, Initializing weights, Forward Propagation in TensorFlow, Convolution and Maxpool Functions, Regularization using Dropout layer, Adding Dropout Layer to the network, Building CNN Keras
RNN AND LSTM	Recurrent Neural Network	Building ML Models for sequential Data, Recurrent Neural Networks, How does RNN work, Typical RNN Structures, Airline Data Analysis, Preparing Data for RNN, Setting up the RNN model, Analysing the Output

TOPIC	SUB-TOPICS	DETAILS
RNN AND LSTM	Long Short Term Memory	Vanishing or Exploiting Gradients, Gated Recurrent Units, Variations of the GRU, LSTM
UNSUPERVISED LEARNING	Unsupervised Learning - 1	Introduction to Unsupervised Learning, Introduction to Clustering, Using K-means for Flat Clustering, KMeans Algorithm, Using KMeans from Sklearn, Implementing Fit & Predict Functions, Implementing K-Means Class
	Unsupervised Learning - 2	How to choose Optimal K, Silhouette algorithm to choose K, Introduction to K Medoids, K Medoids Algorithm, Introduction to Hierarchical Clustering, Top down/Divisive Aproach, Bottom up/Divisive Approach

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About us

Founded in 2016 by IIT, Stanford and Facebook alumni Coding Ninjas is one of the largest online coding EdTech companies in India. We teach 20,000+ students annually via our online platform.
Our founders have experience of working with Amazon, Facebook, Cars24, and other top startups in India.
As pioneers in EdTech, we are on the path to become India's most loved coding education platform.

IIT Delhi, Stanford, Facebook alumni

Raised Series A funding from InfoEdge Technologies

50,000+ learners across the country

India's most loved coding platform

2016

Founded in 2016

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