CODING NINJAS

Data Science

& Machine Learning

"Machine learning will automate jobs that most people thought could only be done by people."

~Dave Waters

About Coding Ninjas

At Coding Ninjas, our mission is to continuously innovate the best ways to train the next generation of developers and transform how tech education is delivered. Training is designed and provided by professional developers turned educators who have experience working at bigwigs like Facebook, Amazon, Google etc. and are Stanford, IIT, IIIT alumni.

Coding Ninjas teaches 15+ Programming courses in Foundation, Advanced, Data & Development such as Machine Learning, Data Science, Web Development and more.

Doubt Support

We have developed a very scalable solution using which we are able to solve 4000+ doubts every single day with the help of **700+ Teaching Assistants (TAs) on the** platform itself with an average rating of 4.8 out of 5.

Placement Stats

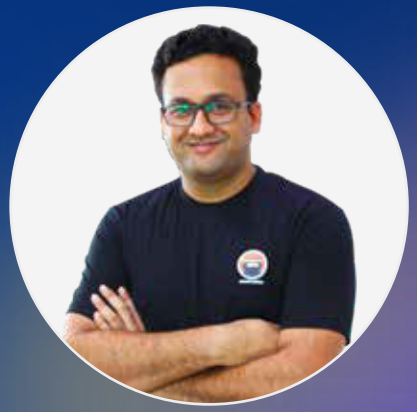
80,000+
Students taught so far

78%+
Percentage placement

2500+
Students placed in top MNCs

7.6L Average Salary
Number of placement partners and average salary of students

100+
Students recieved International job offers



Ankush Singla

Co-Founder & Instructor

Ankush holds a Bachelor's degree in Computer Science from India's most premier institute- IIT Delhi and a Master's degree in Computer Science from Stanford University.

He is a coding enthusiast and has worked with bigwigs like Amazon and Facebook in the past.

Quick TAs & Student Experience Team Support

Dedicated TAs and Student experience team to make sure that your doubts get resolved quickly.

Want A Break? Pause Your Course

Take a short break when you need it. Pause your course for upto 60 days. Resume when you are ready

Get An Industry Recognised Certificate

Get awarded with an industry recognised certificate after you complete your programming course

Be A Part Of The Learning Community

Slack groups to meet your batchmates. Learn from your peers about resources, doubts and more!

Programme Overview

Course Overview

This course will help you to learn Data Science by building expertise in Data Cleaning, Data Visualisation and Data Analysis to obtain actionable insights out of gigabytes of data using various statistical techniques. Also, it will help you to build and refine your Machine Learning skills with the help of topics like Statistics, Neural Networks, Deep Learning etc.., and equip yourself to understand the predictive models.

Features

12+	4.8	70+
Real-Time Projects	Rated by 1000+ Students	hours of video content

WHY
Data Science
& Machine Learning?

Data Science helps to gain insights from data that deals with real world complexities. Whereas, Machine learning brings together computer science and statistics to harness predictive power. Data science and Machine Learning has become an integral part of of the organizations, web applications, products and services like Facebook, Netflix, Google, Amazon etc.., and helps to improve the user experience and make decisions. This field is continuously evolving and provides multiple job opportunities like Data Analyst, Business Analyst, Data scientist, Machine Learning Engineer etc..,

Companies Hiring

amazon | Adobe | LinkedIn

intel | slack | Google

ORACLE | zomato | Flipkart

Course Outcome

- Data science and machine Learning will help you gain a unique position between the business and IT stakeholders.
- This course will enhance your ability to handle gigabytes of data, statistics, numbers and facts which can be used in developing Machine learning algorithms.
- By the end of this course, you will be equipped with the required skills and knowledge to apply for jobs such as Data Scientist, Machine Learning expert, Data Analyst etc. in top tech companies like Google, Uber, Facebook, Amazon, Slack and more.

Placement after the course

Arpan Singh

ATLASSIAN

Uday Kiran Bakka

SAMSUNG

Muskan Gupta

Cognizant

Sparsh Gupta

nagarro

Course Offerings

Basic	Standard	Pro	Premium
x	Introduction to Programming	x	Introduction to Programming
x	Data structures and algorithms	x	Data structures and algorithms
Data Science and Machine Learning	Data Science and Machine Learning	Data Science and Machine Learning	Data Science and Machine Learning
x	x	Spotlight Hirist Account	Spotlight Hirist Account
x	x	10 Mock interview/Industry mentor guidance sessions	10 Mock interview/Industry mentor guidance sessions
x	x	Resume/profile[Linkedin/ Github] building workshops	Resume/profile[Linkedin/ Github] building workshops
x	x	100+ curated interview problems	100+ curated interview problems
x	x	DSA Mock test series to crack product companies	DSA Mock test series to crack product companies
09 Months, 70+ Hours, 12+ Projects	15 Months, 130+ Hours, 12+ Projects, 300+ Problems	11 Months, 70+ Hours, 12+ Projects, 100+ Problems	17 Months, 130+ Hours, 12+ Projects, 400+ Problems

Introduction to Programming

Standard/Premium

Learn the basics of the most popular programming languages (Python) and become an expert in the core fundamentals of programming.

Data Structures and Algorithms

Standard/Premium

Data structures and algorithms is all about organizing the information and finding the most efficient approach to solve a problem. Learning these concepts will in turn help you to improve your problem-solving skills and solve any real-world problems using technology.

Data Science

Basic/Standard/Pro/Premium

Learn techniques to extract the data from different sources like files, web pages, databases etc, and work with the python libraries such as Numpy, pandas, Matplotlib, seaborn to analyze, manipulate and visualize the results.

Machine Learning

Basic/Standard/Pro/Premium

Learn to build Classification and Regression models to analyse the patterns in a given dataset which will help to make predictions based on the data. This course will make you eligible for the job roles like Machine Learning Engineer, Data scientist, NLP Scientist, Software developer/engineer (AI/ML).

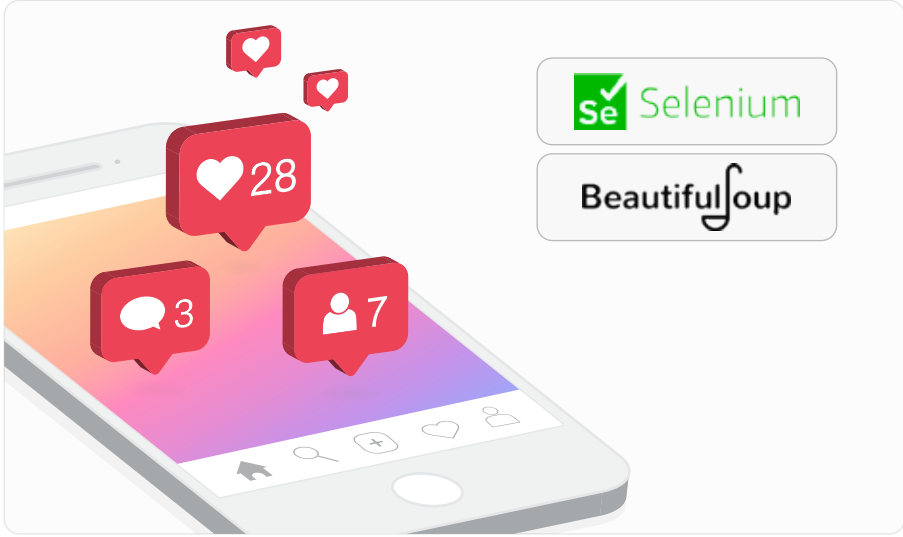
Projects

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.

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.



Gradient Descent Implementation

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

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.

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.

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.

Projects

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.

Urban Sound Classification

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

Text Classification

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

Image Caption Generation

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

Twitter Sentiment Analysis

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

Projects

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.

Facial Emotion Recognition

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

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.

Text Generation

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

Tools and Techniques

Detailed Curriculum

Introduction to Programming

Topics	Sub-topics	Details
Basics of Programming	Flowcharts, Variables and Data types	Flowcharts, Variables and data types, Arithmetic Operators
	Conditional statements	Introduction to If Else, Relational and logical operators
	Backtracking	Introduction to backtracking, Problems based on backtracking: Rat in the maze, Word search, and N-Queens
Loops and Functions	Loops	While loops, For loops, Break and Continue
	Functions	Introduction to functions, Working of function calling, Pass by value
Arrays/lists	Introduction and Searching + Sorting Algo	Introduction to arrays, How arrays are stored in memory, Passing arrays to functions, searching and sorting
Strings and 2D Arrays	Strings	Introduction to strings, storage of strings and their inbuilt functions
	2D Lists	2D lists, Storage of 2D lists, Example problems using 2D Lists

Data Structures and Algorithms

Topics	Sub-topics	Details
Problem Solving Techniques	Recursion	Introduction to recursion, Recursion using strings, Recursion using 2D arrays
	Time and space complexity	Time complexity analysis of searching and recursive algorithms, Theoretical space complexity, Space complexity analysis of sorting algorithms
Object-oriented programming	Basics and Advanced Concepts of OOPs	Introduction to oops concepts, Inbuilt constructor and destructor, Static members, Abstraction, Encapsulation, Inheritance, Polymorphism, Virtual functions, Abstract classes, Exception handling
Linear Data Structures	Linked Lists	Inserting node in linked list, Deleting node from linked list, Merge sort, Reversing a linked list
	Stacks and Queues	Introduction to stacks, Stack using arrays, Queue using linked list, Inbuilt queue
Trees	Generic Trees	Introduction to Trees, Making a tree node class, Taking a tree as input and printing, Tree traversals, Destructor for tree node class
	Binary Trees and Binary Search Trees	Introduction to Binary Trees, Taking a binary tree as input and printing, Binary Tree traversals, Diameter of binary tree

Topics	Sub-topics	Details
Advanced Data Structures	Priority Queues	Introduction to Priority Queues, Ways to implement priority queues, Introduction to heaps, Implementing priority queues, Heap sort, Inbuilt Priority Queue
	Dictionary & Maps	Inbuilt Hashmap, Hash functions, Collision handling, Insert and Delete operation implementation in hashmap
	Huffman Coding	Introduction to Tries, Insert, Search and Remove operation implementation in Tries, Huffman Coding
Dynamic Programming	Graphs	Introduction to Graphs, Graph Terminology, Graph implementation, Graph Traversals (DFS and BFS), Kruskal's algorithm, Prim's Algorithm, Dijkstra's algorithm
	Introduction to Dynamic Programming	Introduction to Memoization, Introduction to Dynamic Programming, memoization and dynamic programming
	Applications of Dynamic Programming	Longest Common Subsequence (LCS) using recursion, memoization and dynamic programming,memoization and dynamic programming
Game Project	2048 Game & UI	Introduction to 2048 Game, complete code logic, introduction to UI

Data Science

Topics	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
	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
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
Data Manipulation	Working With Files	Introduction, Open and read Text files, Read file line by line, CSV Files, Work with CSV Files, DictReader, Countrywise Killed

Topics	Sub-topics	Details
	NumPy	Introduction, Why NumPy is fast, Create NumPy arrays, Slicing & Indexing, Mathematical Operations - 1D, Boolean Indexing - 1D, Boolean Indexing - 2D, NumPy Broadcasting
	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
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
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
	Advanced Selenium	Implicit Wait, Explicit Wait, Radio buttons and checkbox, Handle dropdown,Infinitely Scroll Webpage, Infinite Scrolling, Switch tab focus, Handle popups

Topics	Sub-topics	Details
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
	Seaborn	Categorical Distribution Plots, Categorical Scatter plots, Plotting with Categorical Data, Visualizing Statistical Relationships - ScatterPlot, 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
	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
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

Topics	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
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
	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
	Project: Cifar10	Build a classifier for classifying 10,000 images into 10 classes (dog, horse, cat etc) using the CIFAR-10 Dataset.

Topics	Sub-topics	Details
Natural Language Processing	NLP - 1	Using Words as Features, Basics of word processing, 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
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 TensorFlow, Constants, Session, Variables, Placeholder, MNIST Data, Initialising Weights and Biases, Forward Propagation, Cost Function, Running the Optimiser, How does the Optimiser work?, Running Multiple Iterations, Batch Gradient Descent
	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 Networks, 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
	Long Short Term Memory	Vanishing or Exploiting Gradients, Gated Recurrent Units, Variations of the GRU, LSTM

Topics	Sub-topics	Details
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 Approach, Bottom up/Divisive Approach
Git	Git	Learn about version control systems
Projects	Facial Emotion Recognition	Build an advanced model with the ability to predict the facial emotion of a person in an image.
	Text Generation	Build a Neural Network based model to predict what the next word will be in a sequence of words/sentences.
	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.
	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.

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