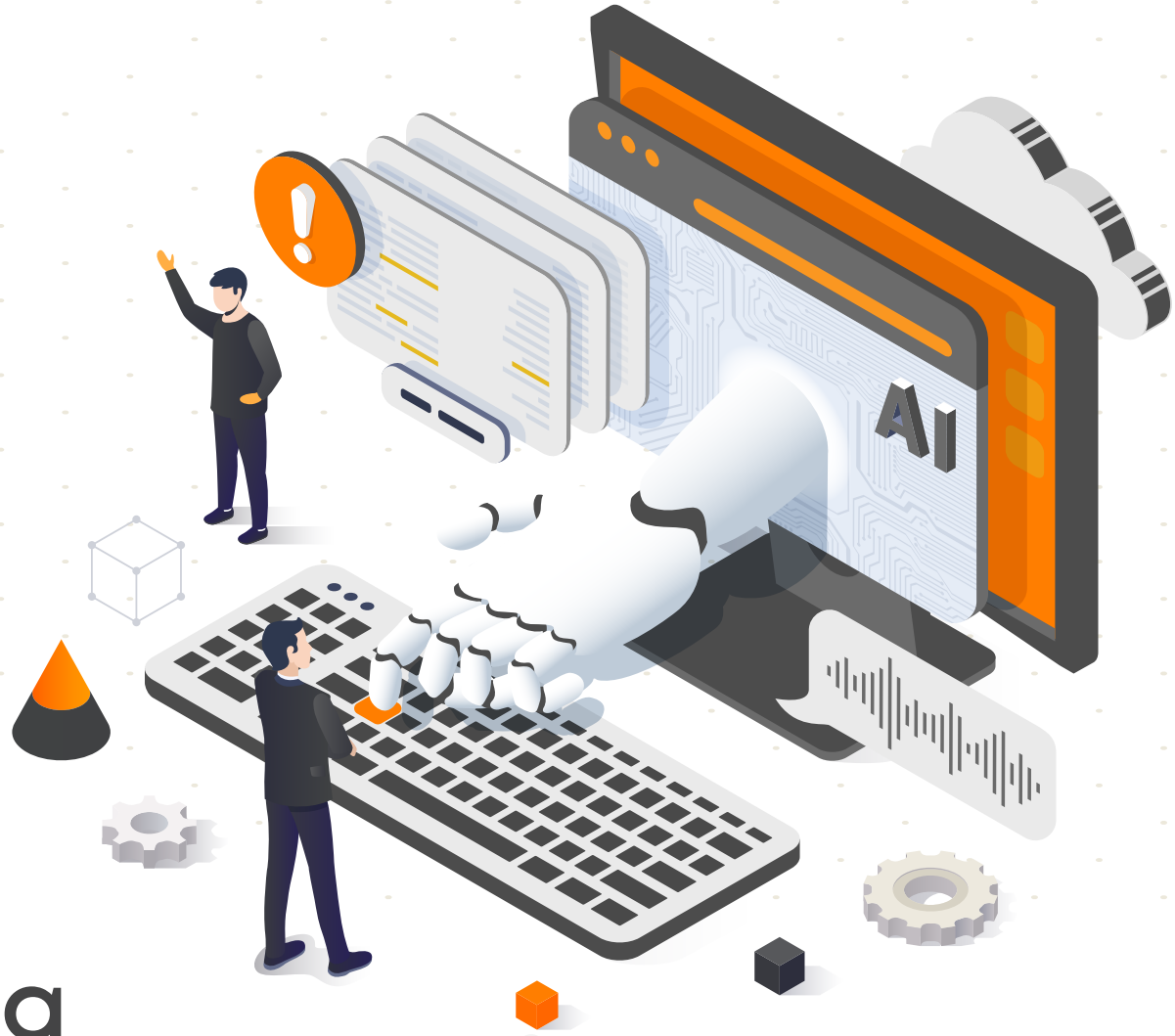
CODING NINJAS



Machine Learning

And Deep Learning

"Machine intelligence is the last invention that humanity will ever need to make.."

~Nick Bostrom

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

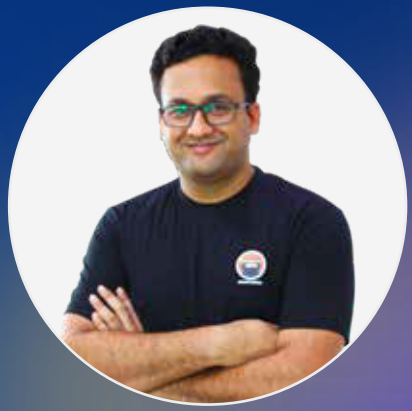
80,000+
Students taught so far

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 build and refine your skills with the help of topics like Statistics, Trees, Neural Network etc and equip yourself to understand the predictive models of tomorrow with a blink of an eye.

Features

9+	400+	100+
Projects	Problems	hours of video content

WHY
Machine Learning and Deep Learning?

- In today's data-driven world Machine Learning and Deep learning algorithm helps us to create models or solution.
- It opens a world of opportunities because you can develop cutting edge technologies.
- These jobs are high in demand.

Companies Hiring

amazon | Adobe | LinkedIn

intel | slack | Google

ORACLE | zomato | Flipkart

Course Outcome

Introduction To Programming

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

Data Structures And Algorithms

Data structures and algorithms is all about organising 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.

Machine Learning And Deep Learning

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).

Placement after the course

Vardan Sharma

Flipkart

Shubhangi Singh

amazon

Dinesh Kumar

FINOIT

Course Offerings

Basic	Standard	Pro	Premium
x	Introduction to Programming	x	Introduction to Programming
x	Data structures and algorithms	x	Data structures and algorithms
Machine Learning and Deep Learning	Machine Learning and Deep Learning	Machine Learning and Deep Learning	Machine Learning and Deep Learning
x	x	Spotlight Hirist Account	Spotlight Hirist Account
x	x	Mock interview/Industry mentor guidance sessions (10)	Mock interview/Industry mentor guidance sessions (10)
x	x	Workshops for building your resume and Linkedin/Github profiles	Workshops for building your resume and Linkedin/Github profiles
x	x	Curated interview problems (100)	Curated interview problems (100)
x	x	DSA based product companies Mock Test Series	DSA based product companies Mock Test Series
x	x	2 months Free Course Extension	2 months Free Course Extension
6 Months, 40+ Hours, 9+ Projects	12 Months, 100+ Hours, 9+ Projects, 300+ Problems	8 Months, 40+ Hours, 9+ Projects, 100+ Problems	12 Months, 100+ Hours, 9+ Projects, 400+ Problems

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
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 to Arrays and Lists	Introduction to arrays, How arrays are stored in memory, Passing arrays to functions
	Searching and Sorting	Understanding Binary Search, Selection sor, Bubble sort, Insertion sort, Merging two sorted arrays
Strings and 2D Arrays Lists	Strings	Introduction to strings, storage of strings and their inbuilt functions
	2D Lists	2D arrays, Storage of 2D arrays, Example problems using 2D Arrays

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
	Backtracking	Introduction to backtracking, Problems based on backtracking: Rat in the maze, Word search, and N-Queens
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 and 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
	Graphs	Introduction to Graphs, Graph Terminology, Graph implementation, Graph Traversals (DFS and BFS), Kruskal's algorithm, Prim's Algorithm, Dijkstra's algorithm
Dynamic Programming	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 and UI	Introduction to 2048 Game, complete code logic, introduction to UI

Machine Learning

Topics	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 operators, Conditions,Loops,Fast Iterations
	Functions	Functions, Variable Sized Input and Output
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

Topics	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 Regularisation, Using Logistic Regression from Sklearn
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

Topics	Sub-topics	Details
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
Principal Component Analysis	PCA - 1	Intuition behind PCA, Applying PCA to 2D data, Applying PCA on 3D data, Maths 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.
Major Project	Assignment	Build a music player project with your newly gained skill set
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.

Topics	Sub-topics	Details
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, Convolutional 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
	Project: Text Classification	Build a classifier model using Naive Bayes algorithm to predict the topic of an article present in a newspaper
RNN and LSTMt	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
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

Topics	Sub-topics	Details
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

Tools and Techniques

Projects

Neural Machine Translation

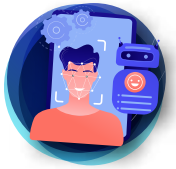
Build an advanced model for the purpose of translation of phrases and symbols from one language to the other using Artificial Neural Network.

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.

Image Caption Generation

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



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.

Text Classification

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

Gradient Descent Implementation

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

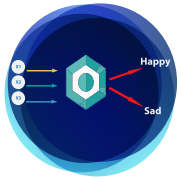
Projects

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.

Twitter Sentiment Analysis

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



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.

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