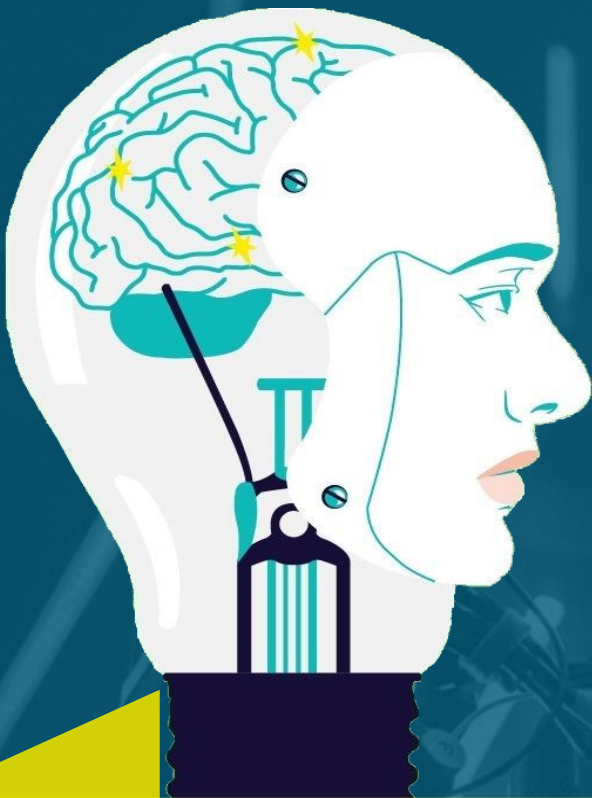


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From knowledge-based learning to skill-based learning  
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Summer Internship & Training on  
**Data Science &  
Machine Learning**

**ElectroCloud Labs**

Hyderabad India  
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Starting its journey from 2015, ElectroCloud is a dynamic Learning and Development service providing company and it is currently a gargantuan repository of more than 200 courses from various fields and has served more than 5000+ clients across the world.

At ElectroCloud, we have collaborated with the topmost colleges, industries, and universities to design paid/funded one time courses, specializations which consist of :



lecture videos



reading materials



online graded quizzes



graded assignments



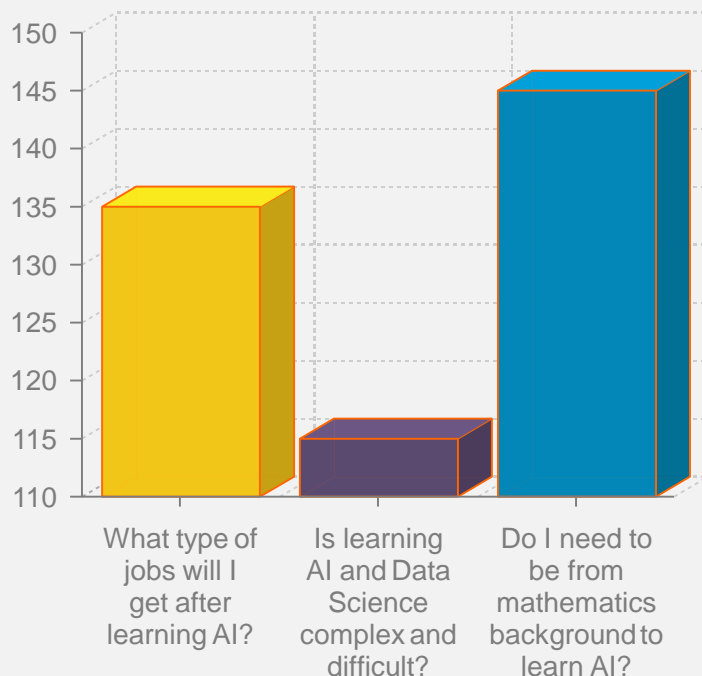
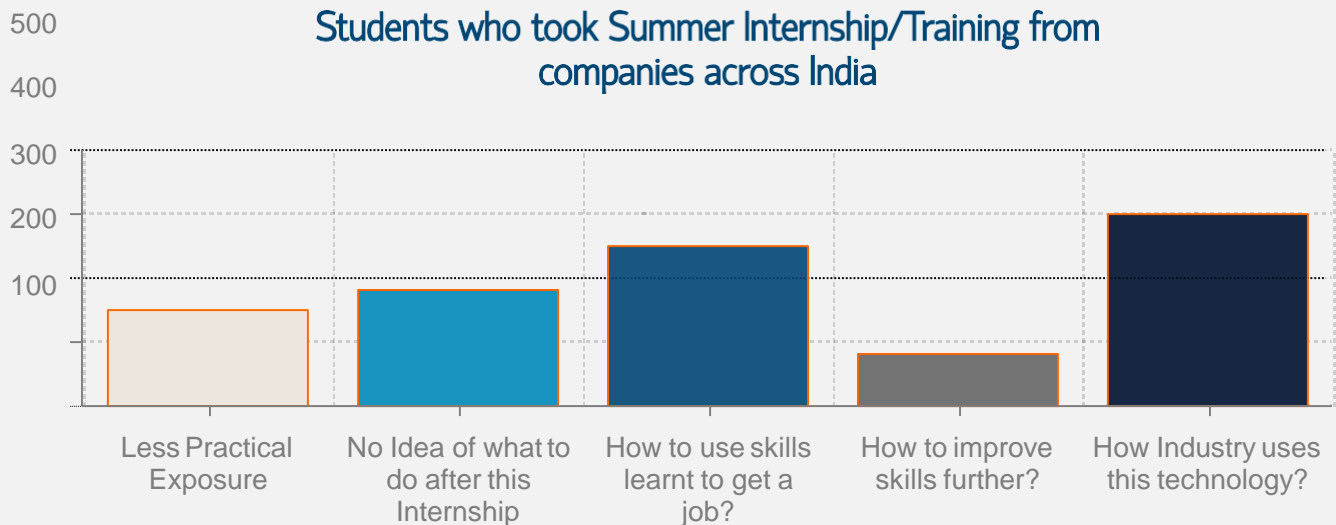
*We promise updated, quality content that will help learners all over the world to add new skills and enrich their knowledge.*

*Anshu Pandey*

CTO



*The problems faced by students during summer internships  
(Based on survey from 5000+ students across India)*

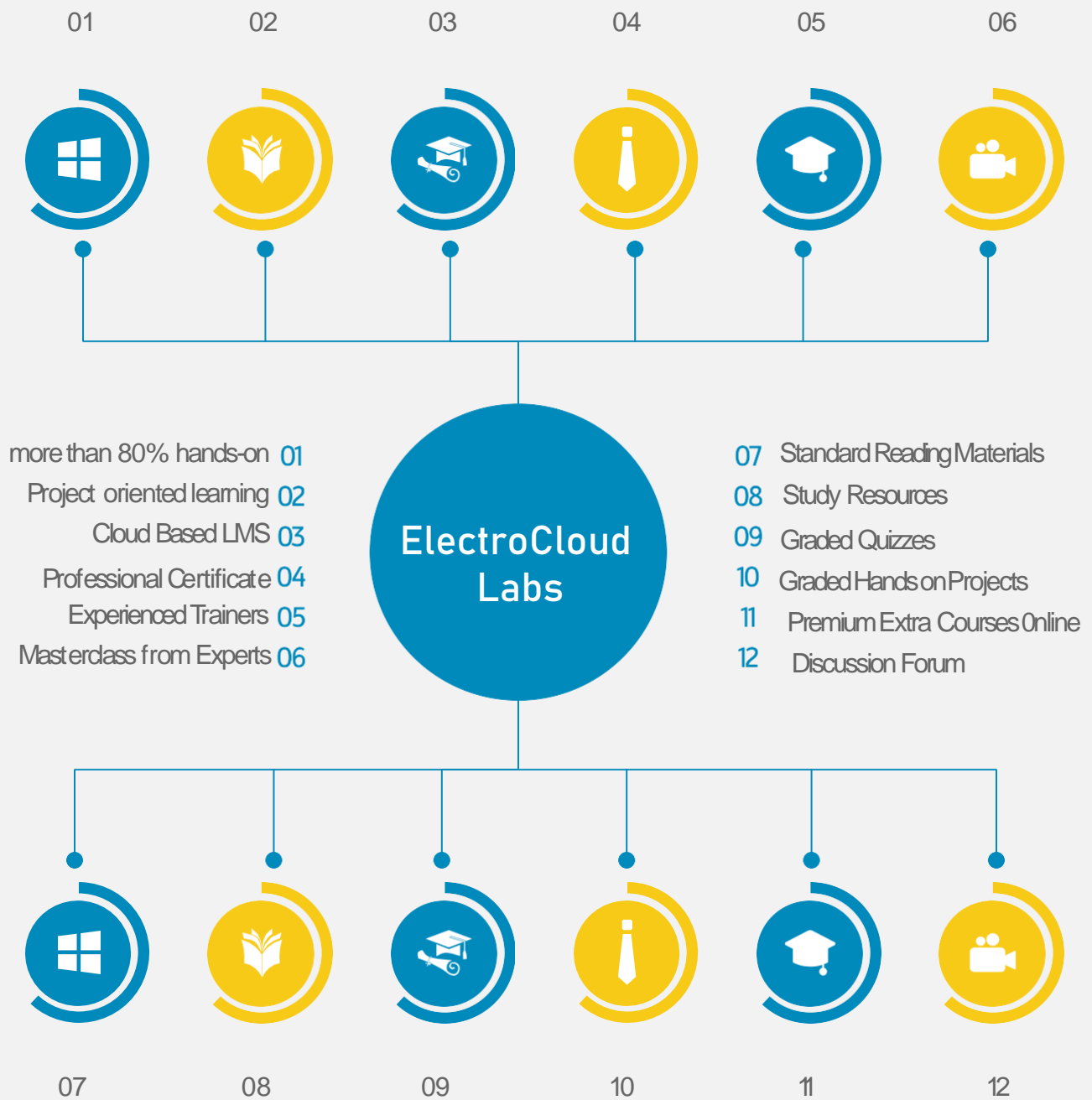


Analysis from students attending Summer Internship across India from different companies.

At electrocloud labs we have collaborated with the top most Industrial and Learning Experts to design optimized structure of Summer Internship & Training.



*Our Goal: Taking out the stumbling rock and providing a clear path to learners*





Us

VS

Other providers



₹7,000

Average Course Fee

(25-30 Days Internship +  
Training)

₹20,000



Online Premium Courses



Continuous Learning Assessment



Masterclass from Experts







## Table of content for Summer Internship and Training on Data Science and Machine Learning

### Module 1

### Introduction to Data Science and AI

#### Introduction to Artificial Intelligence

- Artificial Intelligence & Machine Learning Introduction
- Who uses AI?
- AI for Banking & Finance, Manufacturing, Healthcare, Retail and Supply Chain
- AI v/s ML v/s DL and Data Science
- Typical applications of Machine Learning for optimizing IT Operations
- Supervised & Unsupervised Learning
- Reinforcement Learning
- Regression & Classification Problems
- Clustering and Anomaly Detection
- Recommendation System
- What makes a Machine Learning Expert?
- What to learn to become a Machine Learning Developer?



## *Table of content for Summer Internship and Training on Data Science and Machine Learning*

### Module 2 Python Programming

- Python Programming Basics
- Getting started with Python
- What is Python?
- Installing Anaconda
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- List, tuples and dictionary
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- Functions in python
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- Object Oriented Programming
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- Using Packages
- Os package
- time and datetime
- File Handling in Python
- Miscellaneous Functions in python





## Table of content for Summer Internship and Training on Data Science and Machine Learning

### Module 3 Statistics for ML

- ♦ Introduction to Statistics
- ♦ Population and Sample
- ♦ Descriptive Statistics v/s Inferential Statistics Types
- ♦ of variable
- ♦ Categorical and Continuous Data
- ♦ Ratio and Interval
- ♦ Nominal and Ordinal Data
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- ♦ Measure of Central Tendency – Mean, Mode and Median
- ♦ Percentile and Quartile
- ♦ Measure of Spread – IQR, Variance and Standard Deviation
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- ♦ Inferential Statistics
- ♦ Empirical Rule & Chebyshev's Theorem Z
- ♦ Test
- ♦ One Sample T test, independent t test
- ♦ ANOVA - f test
- ♦ Chi Square test



## Table of content for Summer Internship and Training on Data Science and Machine Learning

### Module 4 Python for Data Science - 1

#### Working with Numpy

- NumPy Overview
- Properties, Purpose, and Types of ndarray
- Class and Attributes of ndarray Object
- Basic Operations: Concept and Examples
- Accessing Array
- Elements: Indexing, Slicing, Iteration, Indexing with Boolean Arrays
- Shape Manipulation & Broadcasting
- Linear Algebra using numpy
- Stacking and resizing the array
- random numbers using numpy

#### Working with Pandas

- Data Structures
- Series, DataFrame & Panel
- DataFrame basic properties
- Importing excel sheets, csv files, executing sql queries
- Importing and exporting json files Data
- Selection and Filtering
- Selection of columns and rows
- Filtering Dataframes
- Filtering -AND operation and OR operation



## *Table of content for Summer Internship and Training on Data Science and Machine Learning*

### Module 5 Python for Data Science - 2

#### Working with Pandas

- Data Cleaning
- Handling Duplicates
- Handling unusual values
- handling missing values
- Finding unique values
- Descriptive Analysis with pandas
- Creating new features
- Creating new categorical features from continuous variable
- combining multiple dataframes
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- groupby statistical Analysis
- Apply method
- String Manipulation



## Table of content for Summer Internship and Training on Data Science and Machine Learning

### Module 6 Python for Data Science - 3

#### Basic Visualization with matplotlib

- Matplotlib Features
- :Line Properties
- Plot with (x,y)
- Controlling Line Patterns and Colors
- Set Axis, Labels, and Legend Properties
- Alpha and Annotation
- Multiple Plots Subplots

#### Advance visualization using seaborn

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- Countplots
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- Violin plots
- Swarmplots and pointplots





## ***Table of content for Summer Internship and Training on Data Science and Machine Learning***

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- Data Science Project Life cycle
- Project Topic
- Data Capturing
- Data Cleaning
- Data Analytics
- Working on tools
- Data Visualization tools
- Project Report Completion

## **Module 7**

### **Project - 1**



## Table of content for Summer Internship and Training on Data Science and Machine Learning

### Module 8 ML - Linear Regression

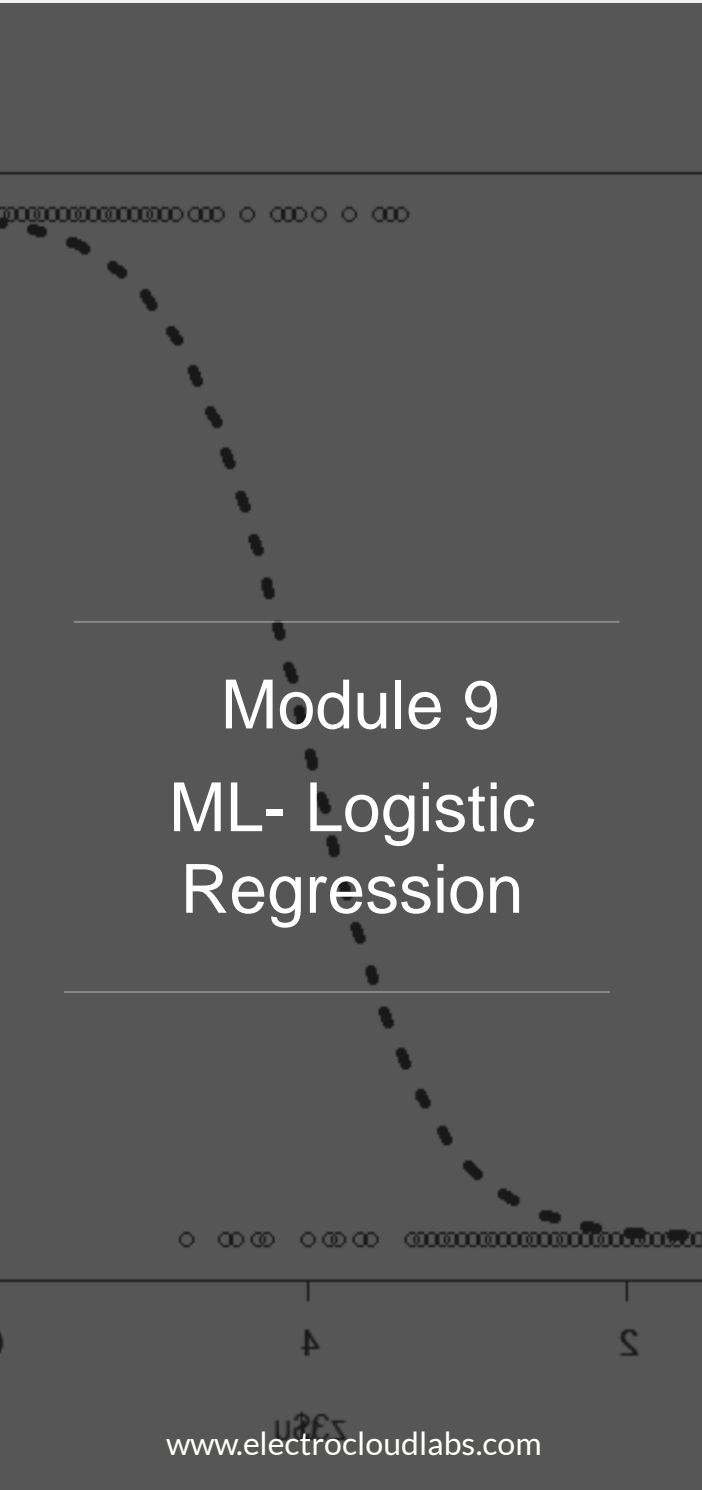
#### Linear Regression Introduction

- The conceptual idea of linear regression
- Predictive Equation
- Cost function formation
- Gradient Descent Algorithm
- OLS approach for Linear Regression
- Multivariate Regression Model
- Correlation Analysis – Analyzing the dependence of variables
- Apply Data Transformations
- Overfitting
- L1 & L2 Regularization
- Identify Multicollinearity in Data Treatment on Data
- Identify Heteroscedasticity Modelling of Data
- Variable Significance Identification
- Model Significance Test
- R<sup>2</sup>, MAPE, RMSE
- Project: Predictive Analysis using Linear Regression





## Table of content for Summer Internship and Training on Data Science and Machine Learning

A scatter plot on a dark background showing a sigmoid curve. The curve is dashed and passes through a series of small circles representing data points. The plot is divided into two horizontal sections by a white line.

### Module 9

### ML- Logistic Regression

#### Logistic Regression

- Classification Problem Analysis
- Variable and Model Significance
- Sigmoid Function
- Cost Function Formation
- Mathematical Modelling
- Model Parameter Significance Evaluation
- implementing logistic regression using sklearn
- Performance analysis for classification problem
- Confusion Matrix Analysis
- Accuracy, recall, precision and F1 Score
- Specificity and Sensitivity
- Drawing the ROC Curve
- AUC for ROC
- Classification Report Analysis
- Estimating the Classification Model
- Project: Predictive Analysis using Logistic Regression



## Table of content for Summer Internship and Training on Data Science and Machine Learning

### Module 10 ML- KNN & Decision Tree

#### K Nearest Neighbour

- Understanding the KNN
- Distance metrics
- KNN for Regression
- KNN for classification
- implementing KNN using Python
- Case Study on KNN
- handling overfitting and undersfitting with KNN

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- Forming Decision Tree
- Components of Decision Tree
- Mathematics of Decision Tree
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- Variance – Decision Tree for Regression
- Decision Tree Evaluation
- Overfitting of Decision Tree
- Handling overfitting using hyperparameters
- Hyperparameters tuning using gridsearch
- Visualizing Decision Tree using graphviz



## Table of content for Summer Internship and Training on Data Science and Machine Learning

### Module 11

### ML- SVM

### & Ensemble Learning

#### Support Vector Machines

- Concept and Working Principle
- Mathematical Modelling
- Optimization Function Formation
- Slack Variable
- The Kernel Method and Nonlinear Hyperplanes
- Use Cases
- Programming SVM using Python
- Project - Character recognition using SVM

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- Concept of Ensemble Learning
- Bagging and Boosting
- Bagging - Random Forest
- Random Forest for Classification
- Random Forest for Regression
- Boosting - Gradient Boosting Trees
- Boosting - Adaboost
- Boosting - XGBoost
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## ***Table of content for Summer Internship and Training on Data Science and Machine Learning***

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- Working Final Project
- Splitting final Project into phases
- Working on structuring project
- Do's and Don'ts with Machine Learning
- Productization of Machine Learning

### Application

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Module 12

Project - 2

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Curiosity is a force, a force that drives us towards the path of exploring new things. At times, when we stumble on the path, we draw back from our quest and this is a scenario where hundreds of students all over the globe lose their will to learn a particular skill when they do not find the right resource.

We at TechTrunk spend thousands of hours & work with experts from Industry to design qualitative courses to make the right learning opportunity available to students.

Team ElectroCloud is working their best to provide help to every learning enthusiast out there so that they can achieve their goals and make good use of what exists in technological world.

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