Teksands High Impact Series

Data Science: Supervised Machine Learning Mastery

Course Duration: 20 Hours
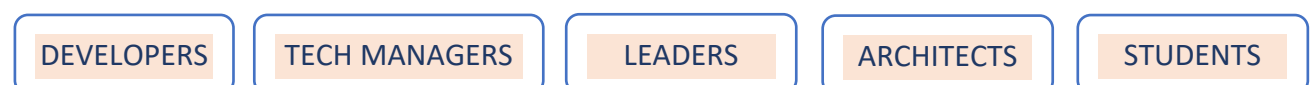
Mode of Delivery: Online, LIVE, Instructor Led

20 Hours	7 Modules	5 Projects	Additional Resources	Certificate

- Python Language

- K-Nearest Neighbours

- Naïve-Bayes Classifier

- Decision Tree Classifiers

- Random Forest Ensembles

- Cross Validation and Hyperparameters

- Building a ML Web Service

- Model Selection Methods

INTENDED AUDIENCE

DEVELOPERS	TECH MANAGERS	LEADERS	ARCHITECTS	STUDENTS

Contact: info@teksands.ai

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ABOUT THIS COURSE

Teksands High Impact Series is designed specifically for the busy professionals who would want to develop the maximum understanding on the topics in the shortest time possible. This course uses a completely practical based approach to run through as much as projects/code/demo as possible and explain both the concepts and coding/solutions parts on the go with the demo. The learners are then given additional projects as practice assignments for them to solve them on their own and solidify their understandings.

AUDIENCE

This LIVE Training Course is designed for Technology Professionals and Students wanting to develop a detailed technical understanding of the application of Machine Learning Algorithms and Models in various fields of Businesses using the Python Programming Language.

This is also very suitable for Technology Managers and Leaders venturing into Data Science and Machine Learning areas to develop detailed understanding in a very quick timeframe.

Broadly, the course will be greatly useful for the following individuals or groups:

- **Business Professionals**
    - Business Persons with a General Interest on the application of Data Science, Predictive Analytics and Machine Learning
    - Managers Interested in Delivering a DS/ML/PA Project
- **Academic Professionals**
    - Machine Learning Students in an Undergraduate or Graduate Course
    - Researchers Interested in understanding this Field
    - Researchers Interested in Modelling Their Problem using ML/DS/PA
- **Engineering Professionals**
    - Programmers Interested in Learning and Implementing Algorithms
    - Developers Interested in Delivering One-Off Predictions
    - Engineers Interested In Developing Smarter Software products And Services
- **Data Professionals**
    - Data Scientists interested in Getting Better Answers to Business Questions
    - Data Analysts interested in Better Explaining Data

PRE-REQUISITE

This course uses the **Python** Language for Data Science and Machine Learning Solutions. Although Python is covered in good detail at the beginning, some prior exposure to Programming Languages will be helpful.

TEACHING METHODOLOGY

The Delivery method is **Online, Live Classes** led by Professional, Industry Experienced Instructors.

DURATION

20 Hours.

Weekday Courses: Over 2 Weeks, all Weekdays (Monday to Friday), 2 hour Sessions per day.

Weekend Courses: Over 3 Weekends, Saturdays and Sundays, 3.5 hour Sessions per day.

(Please check your specific course schedule)

PARTICIPANTS EQUIPMENT AND SOFTWARE REQUIREMENTS

1. Laptop with Windows 7, 8, 10 / MacOS / Linux
2. Internet Connectivity
3. Latest Chrome / Firefox Browser
4. Microsoft Excel
5. Python Version 3 or above (https://www.python.org/downloads/)
6. Anaconda Platform (https://www.anaconda.com/distribution/)

CERTIFICATION

Certificates will be issued to every learner based on attendance and successful completion of the Course Quizzes.

LEARNING GOALS

At the end of this course, the learner will be able to understand the following:

- Types of Business Use Cases where Machine Learning can be applied
- Various types of Machine Learning Algorithms
- Develop Detailed understanding of Python language specific to Machine Learning Applications
- Develop detailed understanding of how to apply Machine Learning Algorithms on the right kind of use cases
- Develop multiple Regression and Classification models

UNDERSTANDING MACHINE LEARNING

Data Science, Machine Learning and Predictive Analytics, subsets or branches of Artificial Intelligence have grown prominently in the last few years to solve a wide range of Business problems which were hitherto impossible to be solved through traditional programming methods. These fields have brought in transformational changes in the way business are looking at and using data to develop insights, making decisions and even predicting future.

Definitions of Machine Learning from Wikipedia:

Machine learning (ML) is the study of computer algorithms that improve automatically through experience.[1] It is seen as a part of artificial intelligence. Machine learning algorithms build a model based on sample data, known as "training data", in order to make predictions or decisions without being explicitly programmed to do so. Machine learning algorithms are used in a wide variety of applications, such as email filtering and computer vision, where it is difficult or unfeasible to develop conventional algorithms to perform the needed tasks.

USE CASES OF MACHINE LEARNING

Today, there are amazing applications of Machine Learning in all spheres of Technology and Business. Massive amount of Automation and Efficiency are being possible in all tech and business domains. It has become almost imperative for every Technology Professional to have some level of understanding of the how to apply Machine Learning in their field of work to drive automation, efficiency and smart decisioning. The key reason behind it is that you need to understand and use Algorithms that work on historical data to understand patterns that can be used to create models for better decisioning and future trend predictions.

Some of the use cases spanning a number of domains are here:

Recommendation Systems: Your views and transactions on Netflix or Amazon are being analysed and subsequent view or purchase recommendations are displayed to you. This is done through analysis of historical transactions of people and creating understanding of their view or purchase behaviours or likings by way of creating models and using these models to predict your next possible move. This is a huge money spinner for all digital businesses selling products and services over the net by understanding and predicting consumer behaviour and driving them towards a likely purchase.

Image Recognition: Medical Diagnostics have got a huge boast by leveraging the image recognition capabilities of Machine Learning, especially through Deep Neural Networks like CNN (Convolutional Neural Networks). We can now detect diseases like cancer faster and more accurately by inputting the scan images of the affected parts.

Natural Language Processing: Machine Learning has also developed the ability to accurately understand and process Natural Languages used by humans leading to various applications such as

complex range of Machine Assistants (or Chatbots) replacing a lot of human functions like Customer Service.

Digital Advertisements: This is another area of Machine Learning techniques that determine the next best advertisement that should be flashed to an individual based on their browsing and search history.

Fraud Detection: Analysing Credit Card or any Financial Transaction and based on their patterns, understand abnormalities to defect Fraudulent ones. Similar methods are applicable in many different areas, e.g. analysing email patterns to detect spam.

Logistics: For Airlines and Travel Companies, Delivery and Logistics Companies, Machine Learning is used to automatically decide on most efficient routes.

Customer Churn Prediction: For any Business, acquisition of new customers are always much more expensive than retaining existing ones. However, churn does happen. Based on Customer churn history and patterns, Machine Learning algorithms can predict with a high degree of accuracy as to which customers may churn in future enabling businesses to take actions to retain them.

There are many more use cases in every domain and that's what makes learning Machine Learning Algorithms an absolute necessity to drive automation, efficiency and decision making in your area of work.

SKILLS DEMAND

With Machine Learning applications booming through businesses leading to saving costs, better profitability and driving newer business models and products, the demand for these skills have skyrocketed. Literally, every business today is after quality skilled professionals in Machine Learning. Not only they are looking for Machine Learning skills to create new solutions, but preferring these as must-have skills in all other fields to drive continuous automation and efficiency.

Some statistics:

70-80% Year on Year New Job Numbers Growth in Machine Learning and related skills
15-20% Year on Year Average Salary Growth in these fields
85% of the Companies are Investing and expanding their Machine Learning Teams rapidly
In 2020-21, there is a net shortage of 250,000+ skilled resources in these fields
2 Years is approximate Machine Learning Staff Tenure in companies

PROFESSIONS / JOB-ROLES IN MACHINE LEARNING SPACE

Machine Learning has served a multitude of functions and job needs and a lot of Job Roles are created in organisations in the last few years. Some of the prominent Job Roles in this space are listed below:

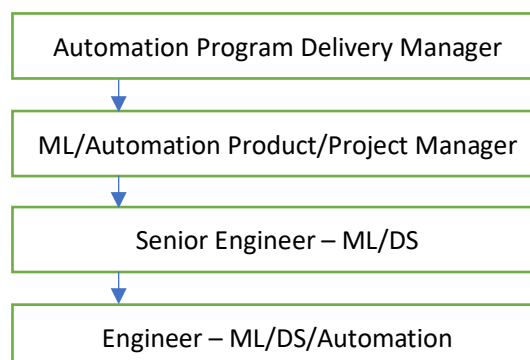| |
|---|
| **Machine Learning Manager:** Responsible for managing and leading Machine Learning based Automation and Decisioning Systems initiatives in the organisation. This includes leading a team of Machine Learning and Data Science Professionals to aggregate organisational data and develop various ML Models using historical data to drive future trend predictions and decisioning. |
| **Machine Learning Engineer/Developer:** Responsible for developing sophisticated Machine Learning Models that are to create various Decision, Prediction, Classification, Clustering systems on Business Data. |
| **Machine Learning Scientist:** Responsible for developing newer Machine Learning Algorithms and architectures for newer use cases. This role requires a thorough understanding of the mechanics of present algorithms and mathematics for ML. |
| **Machine Learning Product Developer:** Responsible for developing Machine Learning based platforms and products. |
| **Computer Vision Engineer / Natural Language Engineer / Deep Learning Engineer:** ML Engineers with responsibility and focus on specific area of Machine Learning. |

All the roles above and the plethora of roles this space is offering are growing rapidly in demand and skills shortfall is even expanding leading to high salaries for every skilled personnel in these fields. Career paths and growth in these fields are also faster than other more technologies.

Given "Data is the new Fuel", demand for professionals in these fields in the many years to come will continue to expand unabated creating massive opportunities for data professionals.

Typical Career Hierarchy >>

Automation Program Delivery Manager

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ML/Automation Product/Project Manager

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Senior Engineer – ML/DS

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Engineer – ML/DS/Automation

COURSE OVERVIEW

This LIVE course, Data Science: Supervised Machine Learning Mastery will provide 20 hours of intense LIVE Training to the Learners.

This course covers the following:

1. Understand Supervised and Unsupervised Techniques
2. Understand Classification Techniques and Use cases
3. Understand Clustering Techniques and Use cases
4. Learn and implement K-Nearest Neighbours (Clustering) in Python
5. Learn and implement a Naive Bayes Classifier
6. Learn and implement a Decision Tree Classifier
7. Learn and implement a Random Forest Ensemble model
8. Learn to tune Hyperparameters through Cross-Validation
9. Concepts of Feature Extraction and Feature Selection
10. Understand the difference between classical Machine Learning and Deep Learning methods
11. Diving inside the scikit-learn library
12. Develop a Machine Learning web service

The course is completely based on practical approaches of teaching. Learners will have intense exposure to real code and data while learning the concepts on the go. We will also provide you all the codes used in training and also additional problems for you to work on and practice.

The course includes a detailed insight into the how Data is Analysed, Prepared and used for Machine Learning challenges and incorporates Five Machine Learning Algorithms to solve various types of Prediction and Classification problems using Python in a total of 20 hours to give the maximum value to our learners out of their busy schedule.

COURSE STRUCTURE

Teksands High Impact Series – Machine Learning Mastery using Python: 20 Hours. Course structure as follows:

Topics	Hours (20)
Introduction - Introduction to Machine Learning and Data Science - Understanding Classification Techniques - Understanding Clustering Techniques - Supervised and Unsupervised Learning - Understanding Exploratory Data Analysis	3
Nearest Neighbour - Use cases of KNN Algorithm in real-life - Concepts of KNN - Practical project walkthrough of KNN: MIST Dataset - Hyper-parameter Tuning - Limitations of KNN - Building a Movie Recommendation System using KNN	3
Classification using Naïve-Bayes - Understanding probability and Naïve-Bayes Algorithm - Real-life applications of Naïve-Bayes - Creating a Spam Classifier using Naïve-Bayes - Tuning a Naïve-Bayes - Building a Sentiment-Analysis model using Bag-of-Words and Naïve-Bayes Algorithm - Generative and Discriminative Models	3
Understanding Decision Trees - Understanding Decision Tree models - Tuning a Decision Tree model - Create a Customer Churn Model using Decision Tree - Measuring Accuracy	3
Understanding Random Forest - Concept of Ensemble Models - Building Random Forest intuition from Decision Tree concepts - Use cases of Random Forest - Building a Customer Churn model with Random Forest - Comparison with Decision Trees	3
Applied Machine Learning - Hyperparameter Tuning and Cross Validation - Feature Extraction and Feature Selection - Comparison between various Algorithms and choice based on use cases - Understanding Classification Techniques more broadly - Understanding Clustering Techniques - Diving into scikit-learn library	3
Building a Machine Learning Web-Service - Understanding Web-Service Concepts - Building a Machine Learning web-service	2

For more Information, please visit teksands.ai/courses or reach out to us on
info@teksands.ai