



Introduction to Machine Learning

- Traditional programming Vs Machine learning
- Artificial Intelligence Vs ML Vs DL
- Types of Machine Learning problems
- Types of Data : Structured & Unstructured
- Machine Learning vs Deep Learning
- Workflow of ML project
- Most used tools in ML/DL
- Pre-Requisites for learning ML

Traditional Programming

Traditional Programming refers to any manually created program that uses input data and runs on a computer to produce the output. Rules are static and hand crafted here.

Machine Learning

Here the input data and output are fed to an algorithm to create a program. The Rules are not static and change for every input data. Here we first learn the parameter i.e train the algorithm before using it.

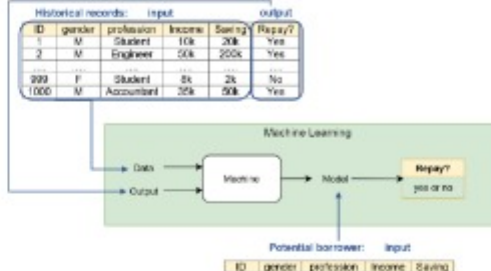


Example of Traditional programming vs ML

Let's say we want to predict if a credit card user will pay he's loan back. The information we can access include the profile of the loan applicants (name, gender, age, profession, marital status, income, saving, past financial history,etc)



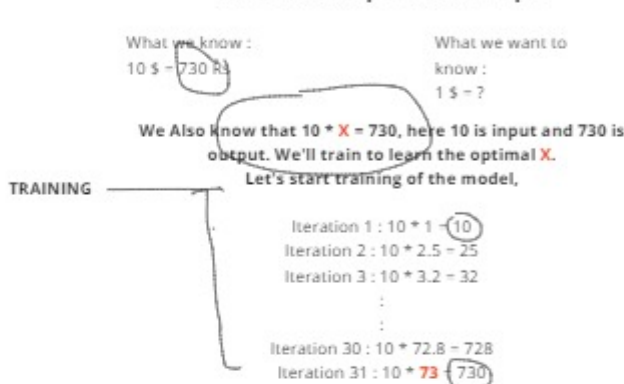
if we use a traditional approach to make a prediction the input to the machine is data and program. Here the data is the information of a new applicant and the program is a set of hand-crafted rules which might be defined by managers' past experiences (Eg. If income > 150k AND saving > 200k, then Repay = Yes). Based on the rules and profile, the machine will output whether the borrower will repay his loan or not.



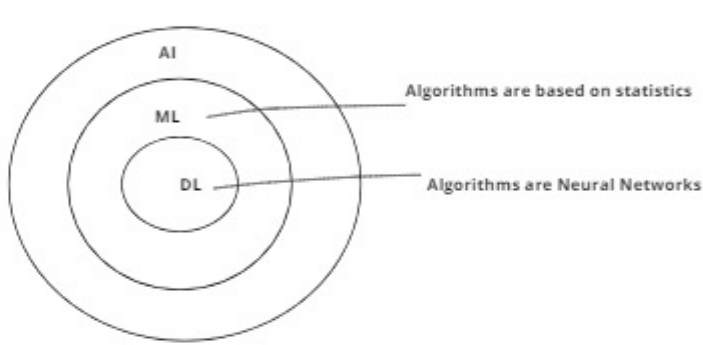
In machine learning the input to the algorithm is data and the output. We try to train the model or in simple words try to learn the relationship between Input and Output. A machine learning algorithm is also called as "model". After the model is learnt, given a profile of new borrower information, the model will automatically make a prediction.

The characteristic of machine learning is trying to learn a model from data. Therefore, machine learning is a data-driven approach rather than to provide hand-crafted rules.

The Dollar-Rupee ML Example



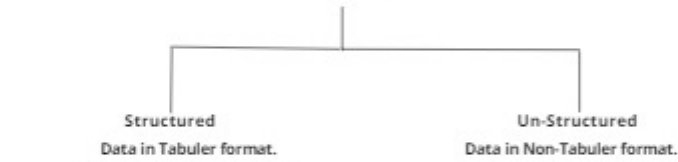
Artificial Intelligence Vs Machine Learning Vs Deep Learning



Types of Machine Learning



Types of Data

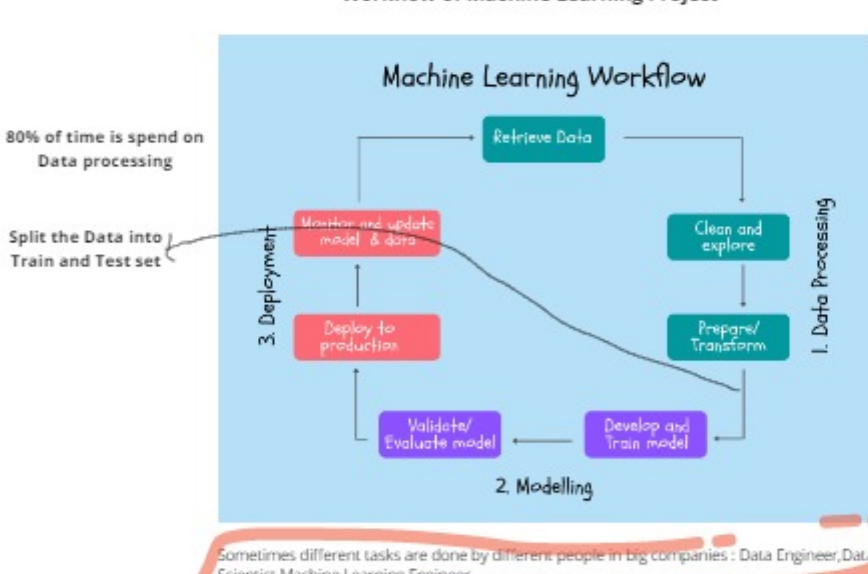


First Name	Last Name	Address	City	Age
Vicky	Viccon	323 Fantasy Way	Anaheim	33
Bel	Flax	321 Cavern Ave	Gotham	34
Wonder	Woman	987 Truth Way	Paradise	30
Danield	Duck	555 Quack Street	Halifax	65
Ege	Bunny	867 Carrot Street	Ramsal	88
Wiley	Coyote	999 Acorn Way	Canyon	61
Get	Woman	234 Perfect Street	Marshall	32
Tweety	Bird	543	Bethlev	20

Machine Learning Vs Deep Learning

- Uses statistical methods to train the model and solve problems
- It is not good at handling unstructured data
- It is easy to train & implement
- It is not efficient at scaling when training on large data
- Trains Neural Networks to solve most problems
- It is good at handling unstructured data
- It is hard to train & implement
- It is efficient at scaling when training on large data

Workflow of Machine Learning Project



Sometimes different tasks are done by different people in big companies : Data Engineer, Data Scientist, Machine Learning Engineer.

Most used Tools in ML/DL

- Programming Languages : Python,R
- Python-Libraries : SkLearn,Keras,Tensorflow,Pytorch
- Other : Google Colab,Jupyter Notebook

Prerequisites Before moving forward...

- Python : Numpy,Pandas & Matplotlib
- High School Maths : Differential Calculus,Statistics & Probability,Linear Algebra (Matrices)

(Hey ! Dont worry if you dont know maths,this series is intended for both software developers and Math savy geeks !)

What you'll learn in this course ?

Pre-requisites :

- 1] Python Programming
- 2] Numpy,Pandas,Matplotlib

Machine Learning :

- 1] Introduction to ML
- 2] Workflow of ML project (types of data,EDA etc)
- 3] Regression problems : Linear Regression,Decision Tree
- 4] Classification Problem : Logistic Regression,Decision Tree,KNN
- 5] Clustering : K-means
- 6] Ensemble : Random Forest

Deep Learning :

- 1] Introduction to DL
- 2] Neural Network
- 3] Activation Functions & Loss Functions
- 4] Convolutional Neural Network
- 5] Transfer Learning
- 6] Recurrent Neural Network

Deploying an ML application