

# MACHINE LEARNING

Google Study  
Jams

Machine Learning  
Crash Course

Intro to  
ML

Python

DIY  
Work

What Next?

MATH





# Introduction

- What is Machine Learning
- Importance of Machine Learning

**SUMMARY**

**Real World  
& ML**



# How ML AI and Deep Learning differ?

## Artificial Intelligence

*the science and engineering of making intelligent machines that have the ability to achieve goals like humans do*

-John McCarthy

## Machine Learning

*large sub-field of AI dealing with the field of study that gives computers the ability to learn without being explicitly programmed. It is a way to implement AI.*

## Deep Learning

*Deep Learning is a technique for implementing Machine Learning. Inspired by working of Human Brain, and Neurons are the origin for the term Neural Networks.*

**More?**

A Venn diagram consisting of three overlapping circles. The largest circle on the right is labeled 'Artificial Intelligence'. The middle circle, overlapping the right one, is labeled 'Machine Learning'. The smallest circle, overlapping both the others, is labeled 'Deep Learning'. The circles are shaded in a gradient from light orange to dark brown. The background is a blurred cityscape at night.

# More

## Deep Learning

The subset of Machine Learning composed of algorithms that permit software to train itself to perform tasks, by exposing multilayered Neural Network to data.  
e.g. Speech and Image recognition

## Machine Learning

A subset of AI that include statistical techniques that enables Machines to improve at tasks with experience

## Artificial Intelligence

Any technique that enables computers to mimic human Intelligence, using logic, rules, decision trees and Machine Learning and Deep Learning

# Real World & Machine Learning

Instance	Example	Major Share in tech
Health Care	Fit-Bands and Wearables	Apple, Samsung
Personal Assistants	Google Assistant, Siri, Alexa, Cortana	Google, Amazon, Apple
Face Recognition	Facebook auto-tags, Google Photos, Face ID	Facebook, Google, Apple
Alternate routes for traffic	Google Maps	Google
Search Suggestions in SEO	Google search, Bing search	Google, Microsoft
Mail Labelling	Outlook, Gmail	Microsoft, Google
Combating Frauds	Online Payment Services	Paypal
Recommendations	Streaming and retail services	Netflix, Amazon, Spotify Flipkart



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# Python

Developed by Guido Van Rossum in 1991

Object oriented  
Imperative  
Functional  
Procedural  
Reflective



Source: Wikipedia

## Only Way?

# Python

## Basic Programming Constructs

-Conditionals, Looping, functions

## Python Data Structures

-List, Tuples, Dictionaries, List Comprehensions

## Libraries in Python

-Scikit-Learn and TensorFlow

## Intro to NumPy, Pandas

-NumPy Arrays and Pandas Dataframes

## Data Visualization

-Importing Data in Python, Matplotlib

## Python Data Structures

-List, Tuples, Dictionaries, List Comprehensions





Source: Wikipedia

# Is Python the only way?



## Why Python Then?

**Less Code**

**Prebuilt Libraries**

**Support**

**Platform Agnostic APIs**

**Flexibility**

**Popularity**



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An aerial night photograph of a city, likely Dubai, showing illuminated skyscrapers, a busy multi-lane highway with light trails from cars, and a body of water with some boats. Overlaid on this image are three orange circles of varying sizes, each containing text related to mathematics and AI.

## **Mathematics**

Mathematics is at the core of AI and  
Machine Learning  
It provides means of how goals of AI  
can be achieved

**STATISTICS**

**ALGEBRA &  
CALCULUS**

A city skyline at night is visible in the background, with various buildings and lights. A large, semi-transparent orange circle is overlaid on the image, covering most of the frame. The text "Do I need to be a Mathematician?" is written in white, bold, sans-serif font across the center of the orange circle.

**Do I need to be a Mathematician?**



# **Statistics and Probability**

Mean Median  
Standard Deviation  
Variance  
Covariance  
Corelation  
Distributions





# Algebra and Calculus

Linear Algebra  
Scalars Vectors Tensors  
Matrices  
Optimization Theory  
Derivatives  
Gradient

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## WHAT NEXT

Google MLCC course –

<https://developers.google.com/machine-learning/crash-course/>

Google Study Jam MLCC is Google's flagship machine learning course, initially created for Google engineers. This course was taken up by more than 18,000 Google Engineers, and was recently made publicly available. This 16 hour curriculum was designed by Google in order to get you started with Machine Learning and pursue your career in ML/AI.

**Next  
Meet**

**OUR  
TEAM**



## **NEXT WEEK**

Detailed Math behind Classification and  
Regression & Loss Functions

Writing your “Hello World” in Machine  
Learning with python

Digging deeper into SciKit-Learn and  
TensorFlow

Creating and testing accuracy for your  
own version of Nearest Neighbors  
Classifier

**And Much More...**



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# Do It Yourself Work

Go and revise  
Practice your Python Skills  
Join Google MLCC Course  
Learn at your own pace  
Complete the exercises we share through e-mail

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