Introduction

About Me

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Associate Product Manager
HCL Technology
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B.Tech. – Computer Science & Engineering

MBA – Marketing & Analytics

- **Product Management (AI & Blockchain), HCL Tech.**
- **Pre-Sales (Analytics & AI), HCL Tech.**
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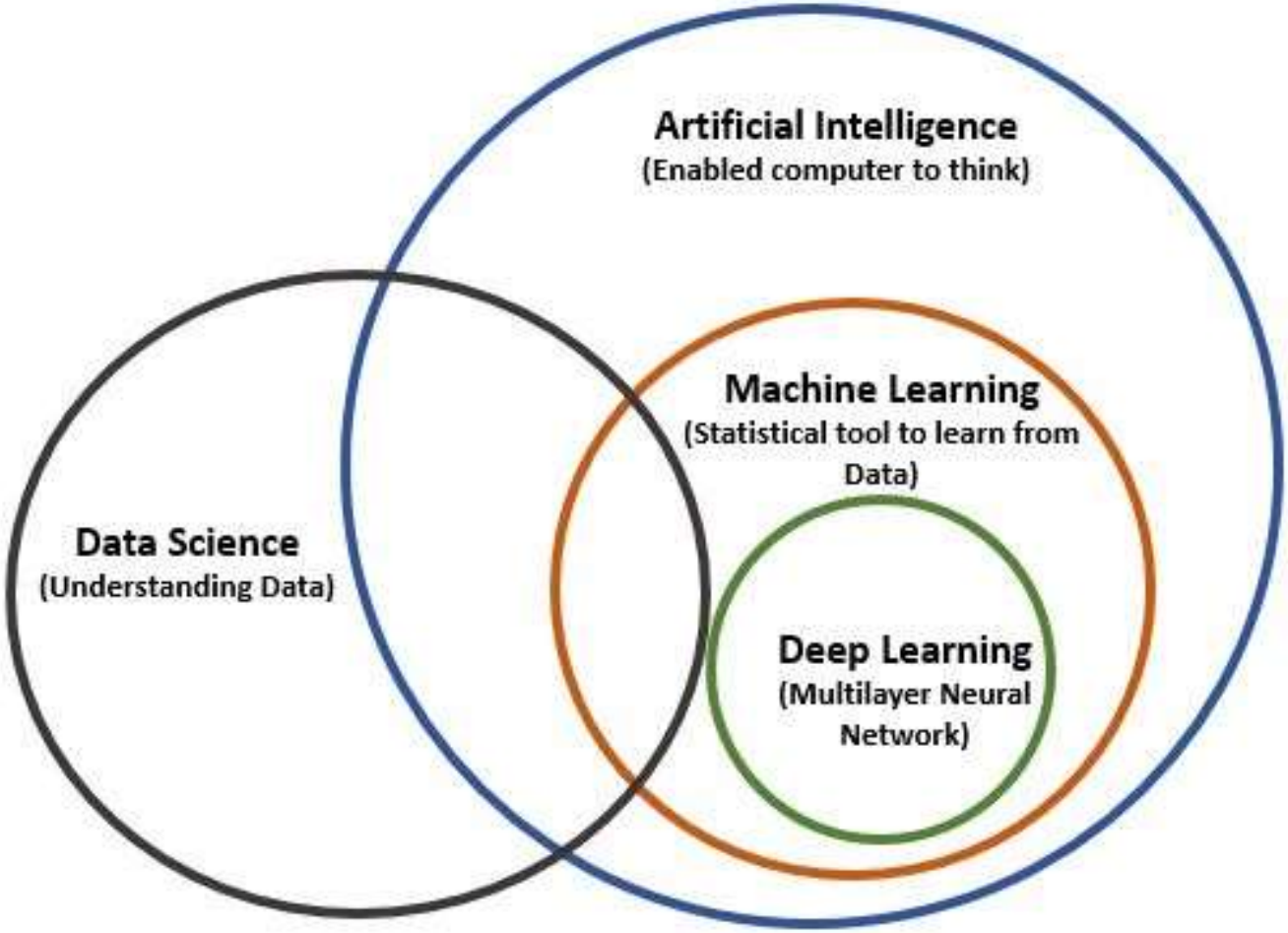
Advertising


amazon


NETFLIX

The Universe – Data Science & Artificial Intelligence



Mathematics

Computer Science

Domain Experience

Artificial Intelligence… Enables computer to think

- **Artificial Intelligence** refers to the overall gamut which **enables computer to think**
- This has evolved from a **rule-based system** to modern application in defense, healthcare, automotive, retail, education, and more.
- The core objective of AI is to **impart human intelligence to machines** and enable them to **act like humans**.

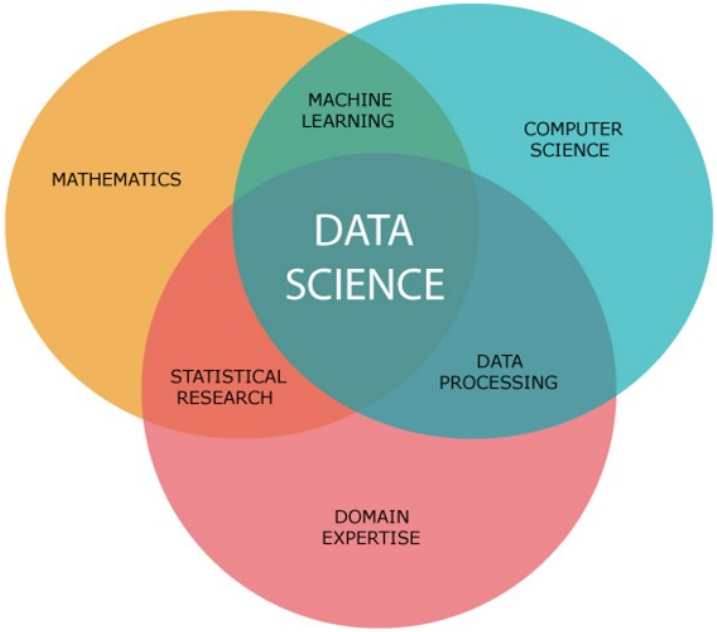
Self Driven Car

Credit Decision

Face Recognition

Data Science… Understanding the data

- **Data Science** is all about making sense of data.
- It overlaps with Machine Learning and Artificial Intelligence techniques, and not so much with Deep Learning
- It has its own areas like **visualization, statistics and more**. It enables us to analyze and manipulate large volumes of data to find meaning and appropriate information.



Evolution from ML To DL

Machine Learning… Statistical tool to learn from data

- **Machine Learning** is a **sub area of Artificial Intelligence** with a bunch of statistical tools to learn from data
- It enables the computer **to decide based on data** rather than **explicitly rule based programs** to perform a specific task.
- The logic and algorithms are **statistically designed in a certain way which learns** and improved over time and enables user to make better decision

Deep Learning… learning inspired by human brain

- **Deep Learning** is a recent area which has taken **shape since 2006 and has given** a new approach to Machine Learning.
- It uses **Multilayered Neural Network** (set of task-specific algorithms that uses neural networks inspired by human brain) for its advances.
- Some of the most important advances in last **6 to 8 years in Artificial Intelligence** has happened using Deep Learning

Machine Learning

Data Exhaust

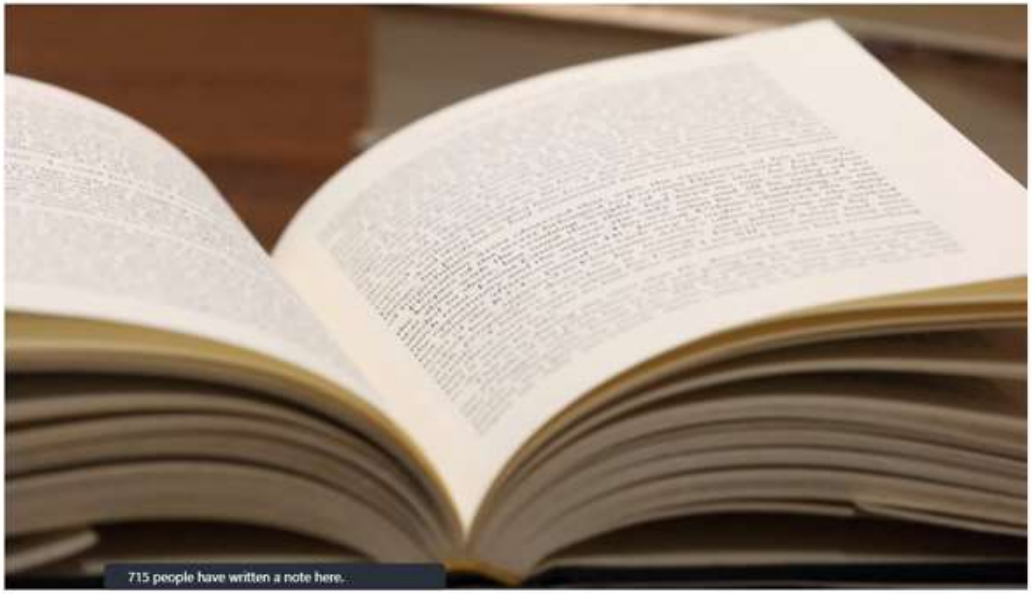
Since the Dawn of Time…
Until 2005…
Humans had created…
130 Exabytes of Data

A

Chapter I

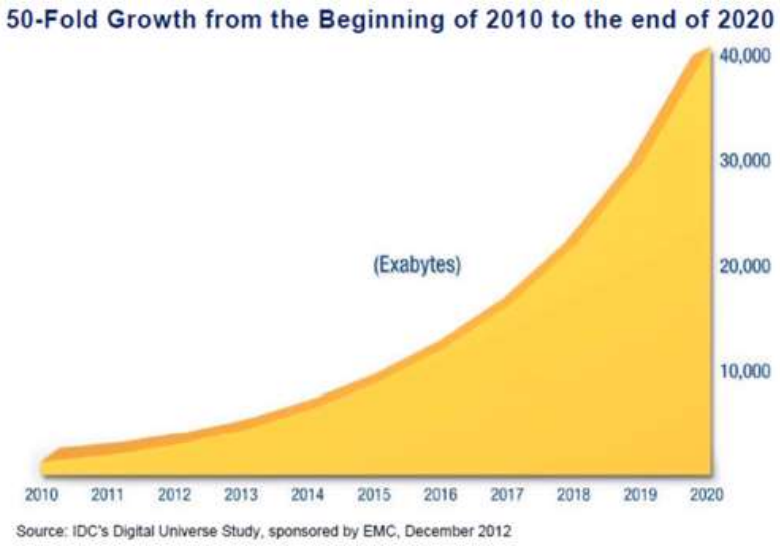
Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, 'and what is the use of a book,' thought Alice, 'without pictures or conversations?' So she was considering in her own mind, (as well as she could, for the hot day made her feel very sleepy and stupid,) whether the pleasure of making a daisy-chain was worth the trouble of getting up and picking the daisies, when a White rabbit with pink eyes ran close by her.

There was nothing very remarkable in that; nor did Alice think it so very much out of the way to hear the rabbit say to itself, 'Oh dear, oh dear! I shall be too late!' (when she thought it over afterwards, it occurred to her that she ought to have wondered at this, but at the time it all seemed quite natural); but when the rabbit actually took a watch out of its waistcoat-pocket, looked at it, and then hurried on, Alice started to her feet,


715 people have written a note here.


HD
SAMSUNG

- Until 2005…130 Exabytes of Data
- 2010… 1200 Exabytes
- 2015… 8000 Exabytes
- 2020…40000 Exabytes of Data



The Ten Most Common Data Science Skills in Job Postings

Skill	Percentage of Job Listings
Python	**72%**
R	**64%**
SQL	**51%**
Hadoop	**39%**
Java	**33%**
SAS	**30%**
Spark	**27%**
Matlab	**20%**
Hive	**17%**
Tableau	**14%**

Source: Glassdoor Economic Research.

glassdoor

Data Engineer

AI Engineer

Data Scientist

Analytics Pre Sales

Data Analyst

ML Engineer

AI Product Manager

Analytics Consultant

Average Application Developer Salary in India

₹501,874

Avg. Salary Show Hourly Rate

₹49,493	₹51,000	₹15,126
BONUS	COMMISSION	PROFIT SHARING

The average salary for an Application Developer in India is ₹501,874.

India / Job / Data Scientist

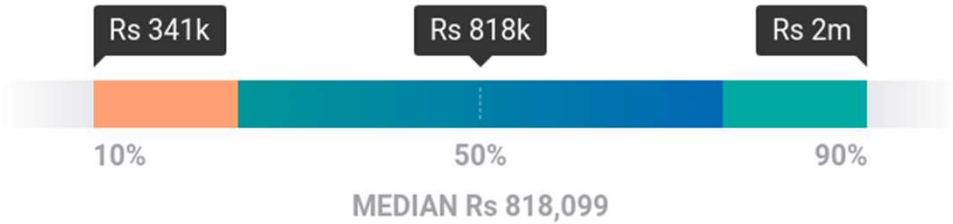
Average Data Scientist Salary in India

Rs 818,099

Avg. Salary Show Hourly Rate

Rs 100,473	Rs 32,500	Rs 36,667
BONUS	COMMISSION	PROFIT SHARING

The average salary for a Data Scientist in India is Rs 818,099.



India / Job / Data Scientist

Average Entry-Level Data Scientist Salary

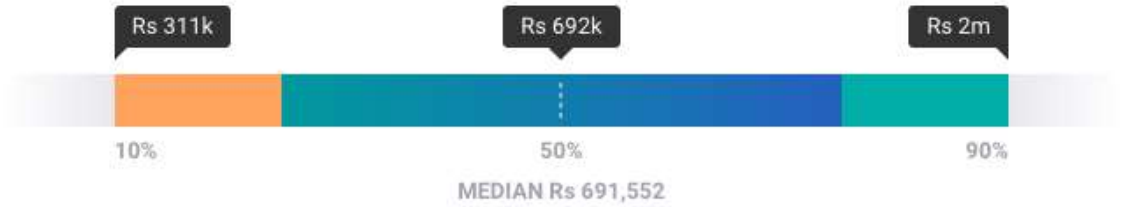
Rs 691,552

Avg. Salary **Show Hourly Rate**

Rs 96,476
BONUS

Rs 24,717
PROFIT SHARING

The average pay for a Data Scientist is Rs 691,552 per year.



Basket of Tools & Techniques

Course Structure


Python
Statistics

Machine Learning

- Part 0 - Welcome to Machine Learning
  - Welcome to Machine Learning
- Part 1 - Data Preprocessing
  - Data Preprocessing
- Part 2- Regression
  - Simple Linear Regression
  - Multiple Linear Regression
  - Polynomial Regression
  - Logistic Regression
- Part 3 – Classification
  - Support Vector Machine
  - Kernal Support Vector Machine
  - Naïve Bayes
  - Decision Tree
  - Random Forest
- Part 4 – Clustering
  - K-Means
  - Hierarchical
- Part 5 – Association Rule Learning
  - Apriori
  - Eclat
- Part 7- Natural Language Processing
  - Bag of Words Model
  - Sentiment Analysis
- Part 8 - Time series Forecasting
  - Time Series Components
  - Classification Technique
  - Techniques – Smoothening , ARIMA etc.
- Part 9 – Dimensionality Reduction
  - Principal Component Analysis
  - Linear Discriminant Analysis
  - Kernel PCA
- Part 10- Model Selection & Boosting
  - Cross validation
  - XG Boost
  - Ada Boost

Deep Learning

- Part 1 – Introduction to Deep Learning
  - Real Life Use Case of Deep Learning
- Part 2- Introduction to Artificial Neural Network
  - Perceptron
  - Architecture of ANN
  - MLPs – Regression & Classification
  - Training using Backpropagation
  - Variants of Gradient Decent
  - Hyperparameter Tuning
- Part 3 – Custom Model & Training with TensorFlow
  - Tensors & Operation
  - Tensors & NumPy
  - Other Data Structure
  - Loading & Preprocessing with TensorFlow
- Part 4 – Convolutional Neural Network
  - Architecture
  - Convolutional Layers
  - Image Analysis using Open CV
  - Tensor Flow Implementation for Image Classification
- Part 5 – Recurrent Neural Network, Time Series and Sequential Data
  - Forecasting Techniques
  - RNN for Time Series
  - GRU & LTSM
- Part 6- Natural Language Processing
  - Text Processing
  - Text Classification
- Part 7 – Recommender Systems
- Part 8 – Transfer Learning for Computer Vision
- Part 9 – Generative Adversarial Network(GAN)
- Part 10--Deep Reinforcement Learning
  - Markov Decision Process
  - Q-Learning
- Part 11--Advances Tensor Usage

Projects

4 – 5 Projects

Bank Loan Default Classification
YouTube Viewers Prediction
HR Analytics
Survival Analytics
Flight Price Classification
Device Failure Analytics
Image Classification
Stock Price Prediction
Recommendation Engines
Handwritten Digit Classification
Fake News Detection
Sentiment Analysis
…. And many more

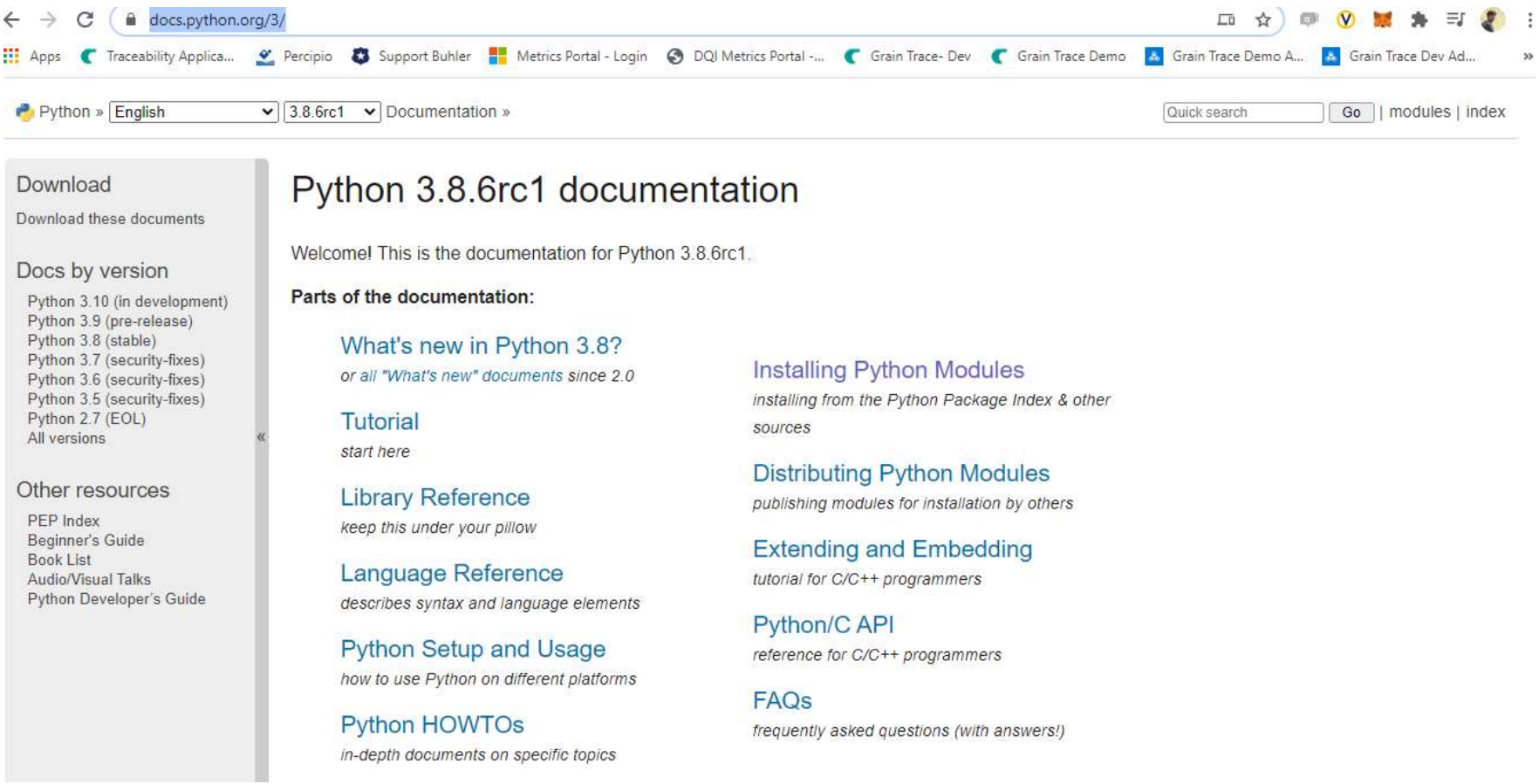
Python

Python – Introduction

- Invented in the Netherlands, early 90s by Guido van Rossum
- Named after Monty Python
- Open sourced from the beginning
- Considered a scripting language, but is much more
- Scalable, object oriented and functional from the beginning
- Used by Google from the beginning
- Increasingly popular

> "Python is an experiment in how much freedom program-mers need. Too much freedom and nobody can read another's code; too little and expressive-ness is endangered."
>
> - Guido van Rossum

https://docs.python.org/3/




PC
SPYDER
jupyter
PyDev

https://www.anaconda.com/products/individual

https://colab.research.google.com/

https://docs.conda.io/en/latest/miniconda.html