Data Science 101

A complete roadmap and guide to learn Data Science ⛳

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✅ What we'll learn today?

- 🤷‍♀️ What is Data Science?
- 🤔 Why is Data Science important?
- 💼 What are the different job roles in Data Science and Machine Learning fields?
- 🥷 What to master to learn Data Science? (Skills)
- 🗓️ How to learn Data Science? (Learning Plan)

What is Data Science?

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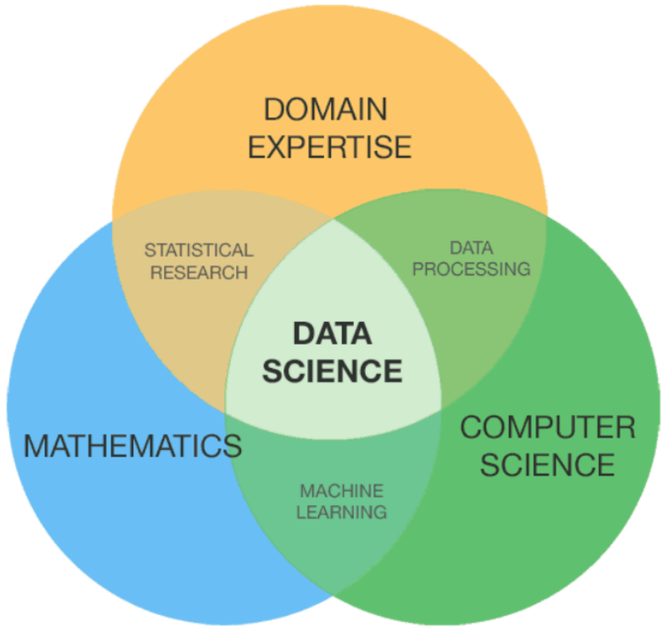
Data Science is a field that deals with data processing, analysis, and extraction of insights from the data using various statistical methods and computer algorithms.

It is a multidisciplinary field that combines mathematics, statistics, and computer science.

Data Science churns raw data into meaningful insights.



Source: Palmer, Shelly. Data Science for the C-Suite. New York: Digital Living Press, 2015. Print.

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🤔 Why is Data Science Important?

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Data is the new oil!

- With the emergence of new technologies, there is an immense (exponential increase) amount of data generated by systems, mobile phones, laptops, computers, etc., that are being stored, which holds a lot of valuable knowledge ready to be explored.
- Data Science is the study of data, where it comes from, what it represents, and how you can use it as a valuable resource for creating business strategies.
- Data Scientists deal with the data to assist companies in making proper decisions.
- The majority of businesses and industries nowadays deal with data on a day-to-day basis.
- Data Scientists leverage the power of data and bring out value from it.
- They convert a business problem into a Data Science problem.

Why is Data important and why do we need it?

- Data Science is a recent discipline in Mathematics and Computer Science.
- Computing process + Cloud Storage + Analytical tools → Computer Science merged with Statistics → Data Science is born!
- Before Data scientists, we only had Statisticians existing. They performed a qualitative analysis of data and analyzed companies' overall performance and sales.
- Earlier, performing data analytics involved much manual effort. Then computers could solve more complex statistical problems efficiently.
- With Data Science, companies make the right business decisions to maximize their profits, solve complex problems, and boost customer experiences with the help of Data!

💼 What are the different job roles in Data Science and Machine Learning fields?

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Data Analyst

Responsibilities:

- Tech Focused > Business Focused
- Datasets are examined to draw conclusions about the information they contain
- Performing statistical analysis to discover new patterns and making reports with recommendations
- Extracting data from various sources
- Analysing data and forecasting trends that impact the organisation
- Develop KPIs and visual representation of information contained in the data
- Working to improve data collection and quality

Skills:

SQL, BI Tools - Tableau | PowerBI | Looker, Statistics, Python, R, Data Wrangling and Mining, Database Management, Cloud Technologies - AWS | GCP | Azure

Credits: Women Who Code

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Business Analyst

Responsibilities:

- Business Focused > Tech Focused
- Identifying and prioritizing the organizations functional and technical needs and requirements
- Using SQL and Excel to analyze large data sets
- Compiling charts, tables, and other elements of data visualization
- Creating financial models to support business decisions
- Forecasting, budgeting, and performing both various analyses and financial analysis

Skills:

Data Analysis and Visualisation tools - Excel, Tableau | PowerBI | Looker, Python, R, SQL

Credits: Women Who Code

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Data Engineer

Responsibilities:

- Tech Focused
- Design, build, and maintain data management systems and data pipelines
- Data collection/acquisition and management
- Implement data processing and transformations
- Working to improve data collection and quality processes
- Implementing security measures for database
- Provide ML models with data

Skills:

Scala, Go, Java, Python, Big Data Technologies, Database Warehousing and Management, Cloud Technologies - AWS | GCP | Azure

Credits: Women Who Code

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Data Scientist

Responsibilities:

- Tech + Business Focused
- Developing predictive models
- Using mathematical, statistical, and programming skills to gain insights from data using Machine Learning techniques
- Performing Exploratory Data Analysis to identify trends in data and make predictions
- Gathering, organizing, cleaning, analyzing data, and verifying the integrity of data
- Analyzing large amounts of data to forecast trends and provide reports with recommendations
- Collaborating with business, engineering, and product teams

Skills:

Machine Learning, Statistics, SQL, NoSQL, Python, R, Data Visualisation Tools, Data Wrangling and Mining, Big Data Technologies, Cloud Technologies - AWS | GCP | Azure, BI Tools

Credits: Women Who Code

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Machine Learning Engineer

Responsibilities:

- Tech Focused
- Implementing and deploying Machine Learning models
- Running and analyzing AI/ML system experiments and tests to improve ML algorithms
- Designing and developing machine learning systems
- Automate ML processes and make models work in a production environment
- Create documentation on ML processes
- Performing statistical analysis
- Make business recommendations

Skills:

Machine Learning, Artificial Intelligence, Python, R, Java, Applied Mathematics, Statistics, Cloud Technologies - AWS | GCP | Azure

Credits: Women Who Code

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Data Analyst - DA

Business Analyst - BA

Data Engineer - DE

Data Scientist - DS

Machine Learning Engineer - ML Eng

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What to master to learn Data Science? (Skills)

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⭐ Programming and Tools

Python
R
SQL
NoSQL
Big Data Technologies
Data Manipulation
Data Visualization
Exploratory Data Analysis

⭐ Statistics and Probability

Descriptive Statistics
Inferential Statistics
Normal Distribution
Hypothesis Testing
Probability
Discrete Distributions
Continuous Distributions

⭐ Mathematics

Linear Algebra
Calculus
Matrices
Vectors and Spaces

⭐ Machine Learning & AI

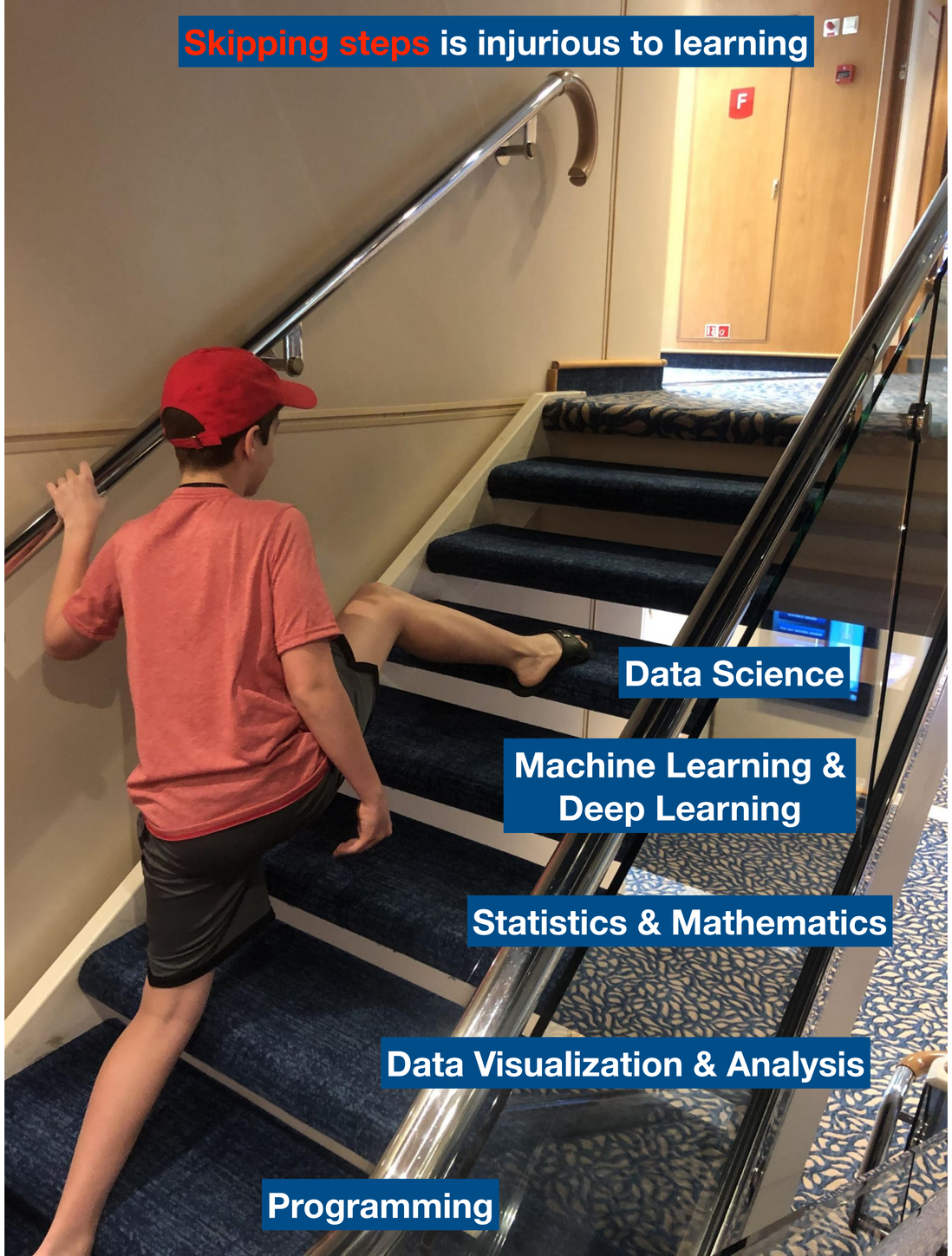
Supervised Learning
Unsupervised Learning
Reinforcement Learning
Deep Learning
Computer Vision
Natural Language Processing

⭐ Domain Knowledge

Business Understanding
Vision and Mission

⭐ Soft Skills

Communication
Presentation
Storytelling with Data
Social Skills
People Skills



How to Learn Data Science? (Learning Plan)

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1. I’m a complete newbie trying to learn from scratch

2. I tried learning on my own earlier but couldn’t proceed any further due to the lack of support, motivation, etc…

3. I have good knowledge and can practice Data Science

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🪴 SQL

- SQL Tutorial - Full Database Course for Beginners by Free Code Camp ↗️
- SQL Masterclass for Data Scientists by Data With Danny ↗️
- Intro to SQL by Kaggle ↗️
- Advanced SQL by Kaggle ↗️

Note: The learning path is an introductory and beginner-friendly plan not limited to the above resources; there is a plethora of information on the internet to browse and learn!

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🪴 Python

- Learn Python - Full Course for Beginners by Free Code Camp ↗️
- Python for Data Science by Great Learning ↗️
- Python for Data Science [Crash Course] by Frank Andrade ↗️
- Python, Data Science & Machine Learning Mini-Course by Andrew Jones ↗️
- Python for Data Science Cheatsheet by Frank Andrade ↗️

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🪴 Data Analysis and Visualization

- Data Analysis with Python Course by Free Code Camp ↗️
- Data Analysis with Python for Excel Users by Free Code Camp ↗️
- Data Analysis with Python Course - Numpy, Pandas, Data Visualisation by Free Code Camp ↗️
- Replace Excel Pivot Table with Python Pandas by Frank Andrade ↗️
- Python Plotting Tutorial with Matplotlib & Pandas by Keith Galli ↗️

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Statistics and Probability

- Statistics - A Full University Course on Data Science Basics by Free Code Camp ↗️
- Introduction to Statistics by 365 Data Science ↗️
- Introduction to the normal distribution by Khan Academy ↗️
- Confidence Intervals by Khan Academy ↗️
- Hypothesis Testing by Khan Academy ↗️
- Probability by Khan Academy ↗️
- Counting, Permutations, and Combination by Khan Academy ↗️
- Discrete Probability Distributions by Jeremy Balka's Statistics ↗️
- Continuous Probability Distributions by Jeremy Balka's Statistics ↗️
- Probability and Statistics: To p pr not p by University of London ↗️
- Harvard University Lectures ↗️
- MIT OpenCourseWare Lectures ↗️

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 Mathematics

- Linear Algebra - Full College Course by Free Code Camp ↗️
- Vectors and Spaces by Khan Academy ↗️
- Matrix Transformations by Khan Academy ↗️
- Calculus 1 by Khan Academy ↗️
- Calculus 2 by Khan Academy ↗️
- Introduction to Calculus by the University of Sydney ↗️
- 3Blue1Brown ↗️
- Mathematics for Machine Learning: Multivariate Calculus by Imperial College London ↗️
- Mathematics for Machine Learning and Data Science Specialisation by DeepLearning.AI ↗️

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Machine Learning and AI

- Machine Learning Course for Beginners by Free Code Camp ↗️
- Machine Learning Specialization by Andrew Ng ↗️
- Deep Learning Specialization by Andrew Ng ↗️
- Deep Learning Lectures by Stanford University ↗️
- TensorFlow 2.0 Complete course by Free Code Camp ↗️
- Keras with TensorFlow Course by Free Code Camp ↗️
- PyTorch for Deep Learning for Free Code Camp ↗️
- Natural Language Processing with Python & NLTK by Free Code Camp ↗️
- Natural Language Processing with SpaCy & Python by Free Code Camp ↗️
- Natural Language Processing with TensorFlow 2 by Free Code Camp ↗️
- Natural Language Processing Zero to Hero by TensorFlow ↗️
- OpenCV Course by Free Code Camp ↗️
- Advanced Computer Vision with Python by Free Code Camp ↗️
- TensorFlow for Computer Vision Course by Free Code Camp ↗️

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🪴 Virtual Internships, Competitions, Hackathons, and Practice

- Awesome YouTubers to follow ↗️
- Forage ↗️

Data Visualisation: Empowering Business with Effective Insights by Tata ↗️ | Data Analytics by Quantium ↗️ | Navigating Numbers by Accenture ↗️ | GE Explorer Series: Digital Technology Data Analytics Program by GE ↗️ | Data Analytics by KPMG ↗️ | Data Science & Analytics by BCG ↗️

- Kaggle ↗️
- Maven Analytics ↗️
- MachineHack ↗️
- DataHack ↗️
- DrivenData ↗️
- AI Planet ↗️
- AI Crowd ↗️
- CodeLabs ↗️
- OpenML ↗️
- UCI Machine Learning Repository ↗️
- Data Flair - Data Science Tutorials ↗️
- Data Flair - Machine Learning Tutorials ↗️

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Thank you 🙋🏽‍♀️

Feedback 🪴

Need any help? 👋🏽

In case you have any questions on this short course or anything else that I can help you with:

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Message 💬

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Woof woof! 🐕❤️

Stay in the Loop 🔔

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LinkedIn ✔

Note: This short course content is based on the learning and personal insights I gained from multiple resources listed in the references section or resources throughout the course.

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