

Data Science

TechGuide - Alura, FIAP e PM3

Data Science

Level 1

Data Science - Fundamentals:

Data Science is the act of using algorithms and systems to extract, organize, and analyze data from various sources in order to detect patterns and make business decisions. The application areas are endless, such as in business, biology, medicine, engineering, etc.

Knowing the concept of Data Mining

Learning the main functions, such as 'describe', 'info', etc

Understanding the role of visualizations such as histograms and boxplots

Knowing what nominal and ordinal categorical variables are

Exploring data in Python with Pandas, Matplotlib, Seaborn and Numpy libraries

Contents

WebSite Amazon AWS: What Is Data Science? (<https://aws.amazon.com/what-is/data-science/>)

WebSite IBM: What is data science? (<https://www.ibm.com/topics/data-science>)

Article How do I start a career in Data Science? The challenging journey & what every beginner need to get started (https://medium.com/@Kelvin_Oyanna/how-do-i-start-a-career-in-data-science-9aa216fad86b)

Article A Python Pandas Introduction to Excel (<https://towardsdatascience.com/a-python-pandas-introduction-to-excel-users-1696d65604f6>)

Users (

Article	Introduction to Numpy: An absolute beginners guide to Machine Learning and Data science (	https://medium.com/hackernoon/introduction-to-numpy-1-an-absolute-beginners-guide-to-machine-learning-and-data-science-5d87f13f0d51)
YouTube	Simplilearn: Data Science In 5 Minutes | What Is Data Science? (	https://www.youtube.com/watch?v=X3paOmcrTjQ)
YouTube	Joma Tech: What REALLY is Data Science? Told by a Data Scientist (	https://www.youtube.com/watch?v=xC-c7E5PK0Y)
YouTube	Ken Jee: How I Would Learn Data Science if I had to start over (	https://www.youtube.com/watch?v=xplFS6jZbe8)
YouTube	Stefanovic: Fastest Way to Become a Data Analyst (	https://www.youtube.com/watch?v=AYWLZ1IES6g)
YouTube	Simplilearn: NumPy and Pandas Tutorial (	https://www.youtube.com/watch?v=FnILzpaSFGk)

Feature Engineering:

Feature engineering refers to the process of using domain knowledge to select and transform the most relevant variables from raw data when creating a predictive model using machine learning or statistical modeling, in order to improve the performance of Machine Learning algorithms.

Generating new variables from the available data

Transforming raw data into characteristics

Highlighting problems with predictive models

Improving model accuracy for new data

Selecting and creating features using Pandas and Scikit-learn libraries

Contents

WebSite	Amazon AWS: What Is Feature Engineering? (	https://aws.amazon.com/what-is/feature-engineering/?nc1=h_ls)
Article	Feature Engineering (	https://corporatefinanceinstitute.com/resources/data-science/feature-engineering/)
	What is Feature Engineering — Importance, Tools and	https://towardsdatascience.com/what-is-feature-engineering-importance-tools-and-

Article	Techniques for Machine Learning (	techniques-for-machine-learning-2080b0269f10)
Article	Introduction to Automated Feature Engineering Using Deep Feature Synthesis (DFS) (	https://heartbeat.comet.ml/introduction-to-automated-feature-engineering-using-deep-feature-synthesis-dfs-3feb69a7c00b)
YouTube	Google Developers: Intro to Feature Engineering with TensorFlow (	https://www.youtube.com/watch?v=d12ra3b_M-O)
YouTube	Greg Hogg: Feature Engineering Techniques For Machine Learning in Python (	https://www.youtube.com/watch?v=GduT2ZCc26E)
YouTube	Krish Naik: Step By Step Process In EDA And Feature Engineering In Data Science Projects (	https://www.youtube.com/watch?v=xhB-dmK mzRk)

Data Extraction and Processing:

Data extraction is the process of collecting or retrieving disparate types of data from a variety of sources, many of which may be poorly organized or completely unstructured.

Obtaining the data to be analyzed

Treating the obtained data, transforming it, changing its structure and values in order to make the database more coherent and ensure that the data to be worked on is in the best conditions to be analyzed

Using the Pandas and Scikit-learn libraries to treat the data

Contents

Article	Data Mining in Brief (	https://towardsdatascience.com/data-mining-in-brief-26483437f178)
Article	Handy-Dandy Python Modules For Data Processing (	https://towardsdatascience.com/handy-dandy-python-modules-for-data-processing-3a85d6806d39)
YouTube	IBM Technology: What is Data Mining? (	https://www.youtube.com/watch?v=7rs0i-9nOjo)
YouTube	edureka!: Data Extraction Using Python (	https://www.youtube.com/watch?v=kEltYHtqQUg)

freeCodeCamp.org: Data Analysis with
YouTube Python - Full Course for Beginners (Numpy, Pandas, Matplotlib, Seaborn) (<https://www.youtube.com/watch?v=r-uOLxNrNk8>)

Python for Data Science:

Python is a high-level interpreted programming language that supports multiple programming paradigms, such as imperative, object-oriented, and functional. It is a language with dynamic typing and automatic memory management.

Learning Python programming logic

Learning the language fundamentals such as variables, functions, lists, conditionals and imports

Creating data analyses

Using Matplotlib to generate graphs

Using and manipulating lists to group data

Knowing the NumPy library

Knowing the Pandas library

Contents

How I would Learn Python Article for Data Science if I Had to Start Over (<https://towardsdatascience.com/how-i-would-learn-python-for-data-science-if-i-had-to-start-over-83fc40ab93ba>)

Python for Data Science: From Scratch (Part I) (<https://towardsdatascience.com/python-for-data-science-from-scratch-part-i-390f01d91748>)

Python For Data Science — A Guide to Data Visualization with Plotly (<https://towardsdatascience.com/python-for-data-science-a-guide-to-data-visualization-with-plotly-969a59997d0c>)

Python Data Science Handbook (<https://jakevdp.github.io/PythonDataScienceHandbook/>)

Nicholas Renotte: Python for Data Science | Beginner Friendly Full Course in 5 Hours (<https://www.youtube.com/watch?v=yGN28LY5VuA>)

Simplilearn: Python Data Science Tutorial (<https://www.youtube.com/watch?v=mkv5mxYu0Wk>)

freeCodeCamp.org: Python for Data Science - Course for Beginners (Learn)

Python, Pandas, NumPy, Matplotlib) (<https://www.youtube.com/watch?v=LHBE6Q9Xlzl>)

Jupyter & Colab notebooks:

Jupyter Notebook and Google Colaboratory are Notebooks that allow the creation of text blocks and code blocks

Notebooks make it easy to write Data Science projects, because you can see the result of the execution right after the code snippet

Google Colaboratory allows you to write and execute Python code directly in the browser, with little to no configuration required

These tools make it easy to share projects among the team

Contents

WebSite Jupyter Notebook (<https://jupyter.org/>)

WebSite Google Colaboratory (<https://colab.research.google.com/>)

YouTube Corey Schafer: Jupyter Notebook Tutorial - <https://www.youtube.com/watch?v=HW29067qVWk>)
Introduction, Setup, and Walkthrough (

YouTube TensorFlow: Get started with Google <https://www.youtube.com/watch?v=inN8seMm7UI>)
Colaboratory (

R for Data Science:

R is a programming language commonly used in computational statistics and data analysis.

Learning to analyze, clean and visualize data

Creating graphs

Joining databases

Drawing statistical summaries

Learning predictive models in R

Contents

Article The R Programming [https://towardsdatascience.com/how-to-learn-r-](https://towardsdatascience.com/how-to-learn-r-language-an-introduction-for-data-science-3a7c8326f969))
Language: An Introduction ([for-data-science-3a7c8326f969](https://towardsdatascience.com/how-to-learn-r-language-an-introduction-for-data-science-3a7c8326f969))

Article	Python vs (and) R for Data Science (	https://brianray-7981.medium.com/python-vs-and-r-for-data-science-833b48ccc91d)
WebSite	R for Data Science: Visualize, Model, Transform, Tidy and Import Data (	https://r4ds.had.co.nz/)
YouTube	Simplilearn: R For Data Science Full Course (	https://www.youtube.com/watch?v=iROHLA_TXQM)
YouTube	freeCodeCamp.org: R Programming Tutorial - Learn the Basics of Statistical Computing (	https://www.youtube.com/watch?v=_V8eKsto3Ug)

Statistics and Math - Fundamentals:

Equations, Functions, and Limits

Logarithms

Matrices, determinants, vectors and vector space

Derivatives and integrals

Difference between mean, median and mode

Frequency distribution

Variance and standard deviation

Binomial, Poisson and normal distributions

Confidence level and confidence interval

Sampling techniques

Linear regression

Time series

Contents

Article	Is mathematical competence necessary for a Data Science role? (	https://medium.com/@luciaadams_14418/is-mathematical-competence-necessary-for-a-data-science-role-us-21bedb676c61)
Article	Teach Yourself Data Science: Math & Linear Algebra (	https://towardsdatascience.com/teach-yourself-data-science-in-2021-math-linear-algebra-6282be71e2b6)
Article	Essential Math for Data Science: Introduction to Linear Algebra (	https://towardsdatascience.com/essential-math-for-data-science-introduction-to-linear-algebra-d8b0338c626d)

Article	Essential Math for Data Science: Introduction to Systems of Linear Equations (	https://towardsdatascience.com/essential-math-for-data-science-introduction-to-systems-of-linear-equations-3f823fdd731e)
Article	Basic Statistics for Data Science (	https://medium.com/mlearning-ai/important-statistical-concepts-for-data-scientists-54e09106b75e)
YouTube	codebasics: Mathematics, statistics for data science and machine learning (	https://www.youtube.com/playlist?list=PLeo1K3hjS3uuKaU2nBDwr6zrSOTzNCs0I)
YouTube	freeCodeCamp.org: Statistics - A Full University Course on Data Science Basics (	https://www.youtube.com/watch?v=xxpc-HPKN28)
YouTube	Geek's Lesson: Statistics and Probability Full Course || Statistics For Data Science (	https://www.youtube.com/watch?v=sbbYntt5CJk)

Data Visualization:

Data visualization is a contemporary expression of visual communication that consists of the visual representation of data.

Mapping abstract data into visual representations

Visually representing data that is present in our real world

Using Python, Matplotlib and Seaborn to generate data visualizations

Contents

WebSite	What is data visualization? (	https://www.ibm.com/topics/data-visualization)
Article	15 Stunning Data Visualizations (And What You Can Learn From Them) (	https://towardsdatascience.com/15-stunning-data-visualizations-and-what-you-can-learn-from-them-fc5b78f21fb8)
Article	Web Scraping, Regular Expressions, and Data Visualization: Doing it all in Python (	https://towardsdatascience.com/web-scraping-regular-expressions-and-data-visualization-doing-it-all-in-python-37a1aade7924)
Article	Introduction to Matplotlib — Data Visualization in Python (	https://heartbeat.comet.ml/introduction-to-matplotlib-data-visualization-in-python-d9143287ae39)
YouTube	TEDx Talks: The Evolution Of Data Visualization (	https://www.youtube.com/watch?v=sOJet45-kcY)

YouTube	Simplilearn: Data Visualization Tutorial For Beginners (	https://www.youtube.com/watch?v=MiiANxRHSv4)
YouTube	freeCodeCamp.org: Data Visualization with D3 – Full Course for Beginners (	https://www.youtube.com/watch?v=xkBheRZTkaw)

Level 2

Machine Learning - Fundamentals:

Machine Learning is a subfield of Engineering and Computer Science that evolved from the study of pattern recognition and the theory of computational learning in artificial intelligence.

Supervised Learning

Using classification algorithms

Using regression algorithms

Using Scikit-learn to create machine learning models

Contents

WebSite	Amazon AWS: What Is Machine Learning? (	https://aws.amazon.com/what-is/machine-learning/?nc1=h_ls)
Article	Machine Learning Introduction (	https://medium.com/@ashishpatel.ce.2011/chapter-1-machine-learning-introduction-53bbdd4b40b3)
Article	Machine Learning | An Introduction (h	https://towardsdatascience.com/machine-learning-an-introduction-23b84d51e6d0)
YouTube	Simplilearn: What Is Machine Learning? | Introduction To Machine Learning (	https://www.youtube.com/watch?v=ukzFI9rgwfU)
YouTube	Fireship: Machine Learning Explained in 100 Seconds (	https://www.youtube.com/watch?v=PeMlggyqz0Y)
YouTube	freeCodeCamp.org: Machine Learning for Everybody – Full Course (	https://www.youtube.com/watch?v=i_LwzRVP7bg)
YouTube	Stanford Online: Stanford CS229: Machine Learning full course taught Andrew Ng (	https://www.youtube.com/playlist?list=PLoROMvovdv4rMiGQp3WXShTMGgzqpfVfbU)

Machine Learning - Unsupervised Learning:

Unsupervised learning, also known as unsupervised machine learning, uses machine learning algorithms to analyze and cluster unlabeled datasets. These algorithms discover hidden patterns or data groupings without the need for human intervention.

Clustering is the set of data mining techniques that aim to automatically group data according to their degree of similarity.

Knowing exploratory analysis

Using K-means, DBSCAN and Mean shift methods to cluster unclassified data

Evaluating the quality of a clustering

Parameterizing clustering methods using the maximum silhouette coefficient

Understanding the mathematics behind the Silhouette, Davies Bouldin and Calinski Harabasz validation metrics

Knowing dimensionality reduction techniques

Contents

WebSite	IBM: What is unsupervised learning? (	https://www.ibm.com/topics/unsupervised-learning)
Article	Unsupervised learning demystified (	https://medium.com/hackernoon/unsupervised-learning-demystified-4060eecedef)
Article	Unsupervised Learning and Data Clustering (	https://towardsdatascience.com/unsupervised-learning-and-data-clustering-eeecb78b422a)
Article	Understanding K-means Clustering in Machine Learning (	https://towardsdatascience.com/understanding-k-means-clustering-in-machine-learning-6a6e67336aa1)
Article	Unsupervised Learning with k-means Clustering With Large Datasets (	https://odsc.medium.com/unsupervised-learning-with-k-means-clustering-with-large-datasets-85c7e96ad715)
Article	How DBSCAN works and why should we use it? (	https://towardsdatascience.com/how-dbscan-works-and-why-should-i-use-it-443b4a191c80)
YouTube	CrashCourse: Unsupervised Learning - Crash Course AI (	https://www.youtube.com/watch?v=JnnaDNNb380)
YouTube	Simplilearn: Unsupervised Learning Algorithms (	https://www.youtube.com/watch?v=D6gtZrsYi6c)

YouTube	Simplilearn: K-Means Clustering Algorithm (	https://www.youtube.com/watch?v=Xvwt7y2jf5E)
YouTube	codebasics: Machine Learning Tutorial Python | K-Means Clustering Algorithm (	https://www.youtube.com/watch?v=EltlUEPClzM)
YouTube	Greg Hogg: DBSCAN Clustering Coding Tutorial in Python & Scikit-Learn (	https://www.youtube.com/watch?v=VO_uzCU_nKw)

Machine Learning - Model Evaluation:

Model Evaluation is the process that uses metrics to help us analyze whether a trained model will perform well in predicting when exposed to new data sets.

Knowing different strategies for model evaluation and optimization

Using a pipeline for training and validation

Knowing the main metrics for evaluating machine learning models

Contents

WebSite	GeeksForGeeks: Machine Learning Model Evaluation (	https://www.geeksforgeeks.org/machine-learning-model-evaluation/)
WebSite	Amazon AWS: Evaluating ML Models (	https://docs.aws.amazon.com/machine-learning/latest/dg/evaluating_models.html)
Article	Evaluating a Machine Learning Model (	https://medium.com/@skyl/evaluating-a-machine-learning-model-7cab1f597046)
Article	Introduction to Machine Learning Model Evaluation (	https://heartbeat.comet.ml/introduction-to-machine-learning-model-evaluation-fa859e1b2d7f)
YouTube	AssemblyAI: How to evaluate ML models | Evaluation metrics for machine learning (	https://www.youtube.com/watch?v=LbX4X71-TFI)
YouTube	Anaconda, Inc.: Machine Learning Model Evaluation Metrics (	https://www.youtube.com/watch?v=wpQiEHYkBys)

SQL - Fundamentals:

Structured Query Language (SQL) is a standardized programming language that is used to manage relational databases and perform various operations on the data in them.

Knowing the most common SQL commands

Using SELECT to query a table

Using INSERT to insert data into a table

Using UPDATE to update a table

Using DELETE to remove data from a table

Using JOIN to connect data from multiple tables

Knowing the clauses (FROM, ORDER BY, etc.)

Contents

W3Schools: Introduction to SQL
WebSite (https://www.w3schools.com/sql/sql_intro.asp)

Amazon AWS: What is SQL? (https://aws.amazon.com/what-is/sql/?nc1=h_ls)

From Basic to
ArticleIntermediate SQL in 10
Minutes (<https://medium.com/analytics-vidhya/from-basic-to-intermediate-sql-in-10-minutes-42b960ed6f9e>)

SQL for Beginners 2022 —
ArticleA Practical SQL Guide (<https://medium.com/@besimum/sql-for-beginners-2022-a-practical-sql-guide-1de6adb43d52>)

Kevin Stratvert: SQL for Beginners
YouTubeTutorial (<https://www.youtube.com/watch?v=h0nxCDiD-zg>)

Fireship: Learn SQL in 23 Easy
YouTubeSteps (<https://www.youtube.com/watch?v=Cz3WcZLRaWc>)

freeCodeCamp.org: SQL Tutorial - Full
YouTubeDatabase Course for Beginners (<https://www.youtube.com/watch?v=HXV3zeQKqGY>)

Web Scraping:

Web scraping or web data scraping is the extraction of data from websites.

Using BeautifulSoup and Python to collect data

Searching and browsing the HTML

Accessing the content and attributes of HTML tags

Building datasets with scraping results

Contents

WebSite	Real Python: A Practical Introduction to Web Scraping in Python (	https://realpython.com/python-web-scraping-practical-introduction/)
Article	Python Web Scraping Tutorial: Step-By-Step (	https://oxylabs.io/blog/python-web-scraping)
Article	Web Scraping With Python: Everything You Need To Know (	https://www.scrapingbee.com/blog/web-scraping-101-with-python/)
Article	Data Science Skills: Web scraping using Python (	https://towardsdatascience.com/data-science-skills-web-scraping-using-python-d1a85ef607ed)
Article	Web Scraping with Python and BeautifulSoup (	https://medium.com/incedge/web-scraping-bf2d814cc572)
YouTube	freeCodeCamp.org: Web Scraping with Python - BeautifulSoup Crash Course (	https://www.youtube.com/watch?v=XVv6mJpFOb0)
YouTube	Tinkernut: Beginners Guide To Web Scraping with Python - All You Need To Know (	https://www.youtube.com/watch?v=QhD015WUMxE)
YouTube	Python Simplified: Web Scraping with Pandas - Automatically Extract All Table Elements From a Web Page (	https://www.youtube.com/watch?v=oF-EMiPZQGA)

Statistical Tests:

Statistical tests are used to examine relationships between variables and test hypotheses.

Creating confidence intervals for samples

Comparing groups of samples

Performing statistical tests

Designing experiments to collect data

Proposing mathematical models to understand a given problem

Building color maps to aid data interpretation

Contents

WebSite	StrataScratch: Basic Types of Statistical Tests in Data Science (https://www.stratascratch.com/blog/basic-types-of-statistical-tests-in-data-science/)
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Article	5 Useful Statistical Tests in Data Science (https://medium.com/mlearning-ai/5-useful-statistical-tests-in-data-science-3bd622028bae)
Article	How to Compare Two or More Distributions (	https://towardsdatascience.com/how-to-compare-two-or-more-distributions-9b06ee4d30bf)
YouTube	Amour Learning: How To Know Which Statistical Test To Use For Hypothesis Testing (	https://www.youtube.com/watch?v=ChLO7wwt7h0)
YouTube	Dr Nic's Maths and Stats: Statistical Tests - Choosing which statistical test to use (	https://www.youtube.com/watch?v=rullUAN0U3w)

Level 3

Deep Learning:

Deep Learning is a branch of Machine Learning based on a set of algorithms that attempt to model high-level abstractions of data using a deep graph with multiple processing layers, composed of various linear and nonlinear transformations.

Building and training models with Keras

Building and training models with Tensorflow

Selecting the layers of a model

Classifying images

Understanding the concepts of weights and biases

Neural networks for regression

Understanding the concept of recurrent networks

Contents

WebSite	IBM: Deep learning (	https://www.ibm.com/topics/deep-learning)
WebSite	Oracle: What is Deep Learning? (	https://www.oracle.com/artificial-intelligence/machine-learning/what-is-deep-learning/)
WebSite	GeeksForGeeks: Introduction to Deep Learning (	https://www.geeksforgeeks.org/introduction-deep-learning/)
Article	Deep Learning: Introduction to PyTorch (	https://medium.com/deeplearningbrasil/deep-learning-introduction-to-pytorch-5bd39421c84)

Understanding PyTorch with <https://towardsdatascience.com/understanding-pytorch-with-an-example-a-step-by-step-tutorial-81fc5f8c4e8e>)

A Simple Tutorial to Classify Images Using TensorFlow — <https://medium.com/@RaghavPrabhu/a-simple-tutorial-to-classify-images-using-tensorflow-step-by-step-guide-7e0fad26c22>)

Simplelearn: Deep Learning In 5 Minutes | <https://www.youtube.com/watch?v=6M5VXKLf4D4>)

Patrick Loeber: Deep Learning With PyTorch - Full Course (<https://www.youtube.com/watch?v=c36IUUr864M>)

freeCodeCamp.org: TensorFlow 2.0 Complete Course - Python Neural Networks for Beginners Tutorial (<https://www.youtube.com/watch?v=R-63YMTnuZw>)

Reinforcement Learning:

Reinforcement Learning is an area of Machine Learning that is concerned with how intelligent agents should take action in an environment in order to maximize the notion of cumulative reward.

Understanding the concepts of agent and reward

Understanding the difference between positive and negative reinforcement

Knowing the Markov Decision Process model

Understanding the concept of Feedback

Using the Q-learning algorithm

Contents

GeeksForGeeks: <https://www.geeksforgeeks.org/what-is-reinforcement-learning/>)

Reinforcement Learning 101 (<https://towardsdatascience.com/reinforcement-learning-101-e24b50e1d292>)

Pathmind: A Beginner's Guide to Deep Reinforcement Learning (<https://wiki.pathmind.com/deep-reinforcement-learning>)

Arxiv Insights: An introduction to Reinforcement Learning (<https://www.youtube.com/watch?v=JgvyzlkxFO>)

YouTube	Nicholas Renotte: Reinforcement Learning in 3 Hours | Full Course using Python (	https://www.youtube.com/watch?v=aIX2JJJoosIM)
YouTube	freeCodeCamp.org: Reinforcement Learning Course - Full Machine Learning Tutorial (	https://www.youtube.com/watch?v=ELE2_Mftqoc)
YouTube	Stanford Online: Stanford CS234 - Reinforcement Learning (	https://www.youtube.com/playlist?list=PLoROMvody4rOSOPzutgyCTapiGIY2Nd8u)

Computer Vision:

Computer Vision is an interdisciplinary scientific field that deals with how computers can gain high-level knowledge from digital images or videos. From an engineering perspective, it seeks to understand and automate tasks that the human visual system can do.

Extracting regions of interest from an image

Normalizing and pre-processing image data

Building classifiers for face recognition

Extracting regions of the human face based on facial landmarks

Analyzing different conditions of each component of the human face

Using OpenCV

Contents

WebSite	NVIDIA: Computer Vision (	https://www.nvidia.com/en-us/glossary/data-science/computer-vision/)
WebSite	GeeksForGeeks: Computer Vision – Introduction (	https://www.geeksforgeeks.org/computer-vision-introduction/)
Article	Introduction to Computer Vision (	https://towardsdatascience.com/introduction-to-computer-vision-b2b74f62c889)
Article	Introduction to Computer Vision & Camera Calibration for Self Driving Cars (	https://sawhney-prateek97.medium.com/introduction-to-computer-vision-camera-calibration-for-self-driving-cars-a69d7912229)
Article	Introduction To Feature Detection And Matching (	https://medium.com/data-breach/introduction-to-feature-detection-and-matching-65e27179885d)

Article	Image Classification with TensorFlow (	https://medium.com/mllearning-ai/image-classification-with-tensorflow-2-54fc601dfb6a)
Article	Computer Vision: Convolution Basics (	https://towardsdatascience.com/computer-vision-convolution-basics-2d0ae3b79346)
Article	Image Processing with Fourier Transform (	https://pub.towardsai.net/image-processing-with-fourier-transform-4ebc66651f2d)
YouTube	CrashCourse: Computer Vision - Crash Course (	https://www.youtube.com/watch?v=-4E2-0sxVUM)
YouTube	Computer vision engineer: Computer vision roadmap | How to become a computer vision engineer (	https://www.youtube.com/watch?v=DfPAvepK5Ws)
YouTube	freeCodeCamp.org: OpenCV Python Course - Learn Computer Vision and AI (	https://www.youtube.com/watch?v=P4Z8_ge2Cu0)
YouTube	Stanford University: Computer Vision (	https://www.youtube.com/playlist?list=PLf7L7Kg8_FNxHATtLwDceyh72QQL9pvpQ)
YouTube	Murtaza's Workshop - Robotics and AI: Computer Vision Game Development in 3 Hours (	https://www.youtube.com/watch?v=IDfplevUWRw)

Natural Language Processing:

Natural Language Processing (NLP) is a subfield of artificial intelligence and linguistics that studies the problems of automatic generation and understanding of natural human languages.

Sentiment Analysis

Creating visualizations to facilitate the analysis of textual data

Knowing the NLTK and Scikit-Learn libraries

Normalizing texts

Using TF-IDF and Ngrams to improve classification

Using SKlearn

Using Regex in PLN

Knowing Word2Vec

Combining word vectors to represent texts and classify them

Contents

WebSite	IBM: What is natural language processing (NLP)? (	https://www.ibm.com/topics/natural-language-processing)
WebSite	GeeksForGeeks: Introduction to Natural Language Processing (	https://www.geeksforgeeks.org/introduction-to-natural-language-processing/)
Article	A Practitioner's Guide to Natural Language Processing (Part I) — Processing & Understanding Text (	https://towardsdatascience.com/a-practitioners-guide-to-natural-language-processing-part-i-processing-understanding-text-9f4abfd13e72)
Article	Gentle Start to Natural Language Processing using Python (	https://towardsdatascience.com/gentle-start-to-natural-language-processing-using-python-6e46c07addf3)
Article	Introduction to Natural Language Processing for Text (	https://towardsdatascience.com/introduction-to-natural-language-processing-for-text-df845750fb63)
Article	How I used Natural Language Processing to extract context from news headlines (	https://towardsdatascience.com/how-i-used-natural-language-processing-to-extract-context-from-news-headlines-df2cf5181ca6)
YouTube	Simplilearn: Natural Language Processing In 5 Minutes | What Is NLP And How Does It Work? (	https://www.youtube.com/watch?v=CMrHM8a3hqw)
YouTube	freeCodeCamp.org: Natural Language Processing (NLP) Tutorial with Python & NLTK (	https://www.youtube.com/watch?v=X2vAabgKiuM)
YouTube	freeCodeCamp.org: Natural Language Processing with spaCy & Python - Course for Beginners (	https://www.youtube.com/watch?v=dIUTsFT2MeQ)
YouTube	Stanford Online: Stanford CS224N - NLP with Deep Learning (	https://www.youtube.com/playlist?list=PLoROMvodv4rOSH4v6133s9LFPRHjEmbmJ)

Auxiliary Skill: Cloud, Big Data and Systems

Big Data and Data Engineering:

Big data is the area of knowledge that studies how to process, analyze, and derive information from data sets that are too large to be analyzed by traditional systems.

Data engineering involves the development and organization of processes for collecting, storing, and transforming large-scale data.

Creating a data pipeline

Knowing Apache Airflow

Knowing Apache Spark

Knowing the Data Lake concept

Interacting with servers in the cloud

Creating Spark applications

Contents

WebSite	Oracle: What is Big Data? (	https://www.oracle.com/big-data/what-is-big-data/)
WebSite	GeeksForGeeks: What is Big Data? (	https://www.geeksforgeeks.org/what-is-big-data/)
WebSite	TechTarget: What is a data engineer? (	https://www.techtarget.com/searchdatamanagement/definition/data-engineer)
Article	An Introduction to Big Data Concepts and Terminology (	https://www.digitalocean.com/community/tutorials/an-introduction-to-big-data-concepts-and-terminology)
Article	Data Engineering 101: Introduction to Data Engineering. (	https://dev.to/kinyungu_denis/data-engineering-101-introduction-to-data-engineering-4md3)
YouTube	Simplilearn: Big Data Tutorial For Beginners (	https://www.youtube.com/watch?v=KCEPoPJ8sWw)
YouTube	AmpCode: Big Data Hadoop Full Course (	https://www.youtube.com/playlist?list=PL6UwySlcwEYJ2hFuGIvr4VEHUAfl-GCNT)

YouTube	coder2j: Airflow Tutorial for Beginners - Full Course in 2 Hours (	https://www.youtube.com/watch?v=K9AnJ9_ZAXE)
YouTube	Simplilearn: Spark Full Course (	https://www.youtube.com/watch?v=S2MUhGA3IEw)
YouTube	Intellipaat: Data Engineering Course | Become A Data Engineer (	https://www.youtube.com/watch?v=OoHPhLV43gg)

Cloud - Fundamentals:

Cloud, or cloud computing, is the distribution of computing services over the Internet using a pay-as-you-go pricing model. A cloud is composed of various computing resources, ranging from the computers themselves (or instances, in cloud terminology) to networks, storage, databases, and everything around them. In other words, everything that is normally needed to set up the equivalent of a server room, or even a complete data center, will be ready to use, configured, and run.

Knowing the difference between IaaS, PaaS and SaaS

Knowing the largest cloud providers

Specializing in a specific provider of your choice

Contents

WebSite	Microsoft Azure: What is cloud computing? (	https://azure.microsoft.com/en-us/resources/cloud-computing-dictionary/what-is-cloud-computing/)
WebSite	Amazon AWS: What is cloud computing? (	https://aws.amazon.com/en/what-is-cloud-computing/)
Article	A beginner's guide to the basics of what cloud computing is about (	https://scientya.com/a-beginners-guide-to-the-basics-of-what-cloud-computing-is-about-e8b3b7f25a30/)
Article	Cloud Computing for Beginners (	https://medium.com/hackernoon/cloud-computing-for-beginners-85d168959afb/)
Article	What are Cloud Computing Services [IaaS, CaaS, PaaS, FaaS, SaaS] (	https://medium.com/@nnilesh7756/what-are-cloud-computing-services-iaas-caas-paas-faas-saas-ac0f6022d36e)
YouTube	Simplilearn: Cloud Computing Tutorial for Beginners (	https://www.youtube.com/watch?v=RWgW-CgdIk0)

YouTube	Amazon Web Services: What is Cloud Computing? - Amazon Web Services (	https://www.youtube.com/watch?v=mxT233EdY5c)
YouTube	Ecourse Review: Cloud Computing Services Models - IaaS PaaS SaaS Explained (	https://www.youtube.com/watch?v=36zducUX16w/)

Git & GitHub - Fundamentals:

Git is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

GitHub is a hosting service for software development and version control using Git.

Creating a repository

Cloning a repository

Committing, pushing and pulling to and from the repository

Reversing a commit

Creating branches and pull requests

Handling merge and conflicts

Contents

WebSiteGit Reference Book (<https://git-scm.com/book/en/v2>)

WebSiteGitHub Documentation (<https://docs.github.com/en>)

WebSite	GitHub Pages Documentation (https://docs.github.com/en/pages/getting-started-with-github-pages/about-github-pages)
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WebSite	W3Schools: Git Tutorial (https://www.w3schools.com/git/default.asp?remote=github)
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WebSiteGit School - Visualizing Git (<https://git-school.github.io/visualizing-git/>)

WebSiteDangit, Git!?! (<https://dangitgit.com/>)

Article	Git Tutorial - Explore The Commands And Operations In Git (https://medium.com/edureka/git-tutorial-da652b566ece)
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Article	Git and Github Quickstart Tutorial (https://medium.com/@prashantramnyc/git-and-github-quickstart-tutorial-654a71594dca)
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Article	Getting Started with Git and GitHub: A Complete Tutorial for Beginner (https://towardsdatascience.com/learn-basic-git-commands-for-your-data-science-works-2a75396d530d)
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YouTube	Programming with Mosh: Git Tutorial for Beginners - Learn Git in 1 Hour (https://www.youtube.com/watch?v=8JJ101D3knE)
YouTube	freeCodeCamp.org: Git and GitHub for Beginners - Crash Course (	https://www.youtube.com/watch?v=RG0j5yH7evk)
YouTube	Kevin Stratvert: Git and GitHub for Beginners Tutorial (	https://www.youtube.com/watch?v=tRZGeaHPoaw)
YouTube	Tech With Tim: Git Tutorial for Beginners - Git & GitHub Fundamentals In Depth (	https://www.youtube.com/watch?v=DVRQoVRzMIY)

Linux - Fundamentals:

Linux is a term popularly used to refer to operating systems that use the Linux Kernel. Distributions include the Linux Kernel as well as system software and libraries.

Knowing the Linux directory system

Compacting and uncompressing files

Editing files in the console with VI

Managing the processes running on the machine

Knowing the environment variables and PATH

Managing packages

Performing remote communication with SSH and SCP

Contents

WebSite	Digital Ocean: An Introduction to Linux Basics (	https://www.digitalocean.com/community/tutorials/an-introduction-to-linux-basics)
WebSite	Ubuntu: The Linux command line for beginners (	https://ubuntu.com/tutorials/command-line-for-beginners#1-overview)
Article	10 Linux Commands Every Developer and DevOps Should Learn (	https://medium.com/javarevisited/10-essential-linux-commands-every-developer-and-devops-should-know-9df39391aac7)
Article	Useful Linux Commands — Files and Packages (	https://blog.devgenius.io/useful-linux-commands-files-and-packages-ccd80da6da2b)
YouTube	freeCodeCamp.org: Introduction to Linux – Full Course for Beginners (	https://www.youtube.com/watch?v=sWbUDq4S6Y8)

freeCodeCamp.org: The 50 Most Popular Linux & Terminal Commands (	https://www.youtube.com/watch?v=ZtqBQ68cfJc)
MIT - The Missing Semester of Your CS Education (inglês) (	https://missing.csail.mit.edu/)

Auxiliary Skill: Business

Business Process Management:

Business Process Management (BPM) is a discipline that uses various methods to discover, model, analyze, measure, improve, optimize, and automate business processes.

Contents

What is business process management? (	https://www.ibm.com/topics/business-process-management)
What Is BPM? Learn Everything About Business Process Management (	https://www.sydle.com/blog/bpm-60f88aeab250375797c93ee7)
Business Process Management Meets Data Science (	https://towardsdatascience.com/business-process-management-meets-data-science-b4545f2886cb)
Simplilearn: What Is Business Process Management? (	https://www.youtube.com/watch?v=JG1aBDJ11LE)
RISR Careers: Introduction to Business Process Management (BPM) from an experienced transformation executive (	https://www.youtube.com/watch?v=G-CJR10UqTE)

Business Intelligence (BI) - Fundamentals:

Business Intelligence is a set of theories, methodologies, processes, and technologies that enable the transformation of "raw" data into highly relevant information for a company's decision making.

Knowing the ETL process

Performing modeling and structuring of tables in a Data Warehouse

Creating visualizations that make sense

Knowing PowerBI

Contents

WebSite	IBM: What is Business Intelligence? (	https://www.ibm.com/topics/business-intelligence)
WebSite	GeeksForGeeks: What is Business Intelligence? (	https://www.geeksforgeeks.org/what-is-business-intelligence/)
Article	Introduction to Microsoft Power BI (	https://medium.com/nerd-for-tech/introduction-to-microsoft-power-bi-bd5426558979)
Article	Power BI Tutorials for Beginners: Part 1 (	https://medium.com/@arjunuttamsharma561/power-bi-desktop-for-beginners-b3c2bbac27e4)
Article	Using Python in Power BI (	https://towardsdatascience.com/using-python-in-power-bi-ee95a6b71443)
YouTube	Adam Finer - Learn BI Online: What is Business Intelligence? BI for Beginners (	https://www.youtube.com/watch?v=-l23qGB6JdY)
YouTube	Simplilearn: Business Intelligence Full Course (	https://www.youtube.com/watch?v=Hg8zBJ1DhLQ)
YouTube	Simplilearn: Power BI Full Course (	https://www.youtube.com/watch?v=glA5eG8s0Pw)

Storytelling with data:

Storytelling is a way of telling stories that engage and grab the attention of the person listening. Within data analysis, it is very important to convey information to the receiver in a way that he or she understands not only the data, but also the whole context.

Contents

WebSite	Storytelling with data (https://www.storytellingwithdata.com/)	
Article	Data Analytics for Beginners: Storytelling with Data (	https://careerfoundry.com/en/tutorials/data-analytics-for-beginners/storytelling-with-data/)
Article	Storytelling with data — Part 1 (	https://medium.com/swlh/storytelling-with-data-part-1-a3bdd5138958)
YouTube	Harvard Business Review: Telling Stories with Data in 3 Steps (	https://www.youtube.com/watch?v=r5_34YnCmMY)

YouTube	Google Career Certificates: Crafting Stories with Data (	https://www.youtube.com/watch?v=ApXbhBbZsp4)
YouTube	CareerFoundry: Data Analytics - Telling Compelling Stories With Data (	https://www.youtube.com/watch?v=8EMW7io4rSI)
YouTube	Talks at Google: Storytelling with Data (	https://www.youtube.com/watch?v=8EMW7io4rSI)

Excel:

Microsoft Excel is a spreadsheet editor produced by Microsoft with calculation and table building tools.

Performing the basic mathematical operations with its operators (addition, subtraction, multiplication and division)

Knowing the main formulas, such as 'AVERAGE', 'ROUND', 'MAX', 'MIN', etc.

Performing column searches with the 'VLOOKUP' function

Creating graphs and charts

Contents

WebSite	Microsoft: Excel video training (	https://support.microsoft.com/en-us/office/excel-video-training-9bc05390-e94c-46af-a5b3-d7c22f6990bb)
WebSite	Microsoft: AVERAGE function (	https://support.microsoft.com/en-us/office/average-function-047bac88-d466-426c-a32b-8f33eb960cf6)
WebSite	Microsoft: ROUND function (	https://support.microsoft.com/en-us/office/round-a-number-f82b440b-689d-4221-b21e-38da99d33435)
WebSite	Microsoft: VLOOKUP function (	https://support.microsoft.com/en-us/office/vlookup-function-0bbc8083-26fe-4963-8ab8-93a18ad188a1)
Article	Top 25 MS Excel Formulas One Must Know (	https://medium.com/simplilearn-engineering/top-25-ms-excel-formulas-one-must-know-simplilearn-518c4f0d71cd)
YouTube	Kevin Stratvert: VLOOKUP in Excel (	https://www.youtube.com/watch?v=DZEPA9UHLBw)

YouTube	Teacher's Tech: How to Create Charts and Graphs in Microsoft Excel (	https://www.youtube.com/watch?v=64DSXejsYbo)
YouTube	MyOnlineTrainingHub: How to build Interactive Excel Dashboards that Update with one click (	https://www.youtube.com/watch?v=K74_FNnIIF8)
YouTube	freeCodeCamp.org: Microsoft Excel Tutorial for Beginners - Full Course (	https://www.youtube.com/watch?v=VIOH-qTclOg)
YouTube	Simon Sez IT: The Ultimate Excel Tutorial - Beginner to Advanced - 5 Hours (	https://www.youtube.com/watch?v=TpOIGij43AA)

Communication skills:

A good level of communication facilitates the achievement of objectives, problem solving, and increases productivity, because each professional will know exactly what is expected of them, and will transmit their ideas clearly.

Contents

Article	Nonviolent Communication in the Workplace (	https://www.linkedin.com/pulse/nonviolent-communication-workplace-robert-goldman/)
Article	What Is Nonviolent Communication, and How Can It Benefit You at Work? (	https://www.grammarly.com/blog/nonviolent-communication/)
Article	How to become more assertive at work (your ultimate guide) (	https://www.betterup.com/blog/assertiveness)
Article	Assertive vs. Aggressive Communication in the Workplace (	https://hrdqstore.com/blogs/hrdq-blog/assertive-vs-aggressive-communication-in-the-workplace)
YouTube	Adriana Girdler: How to Improve Communication Skills at Work (	https://www.youtube.com/watch?v=knUEdy-kOIQ)