📘 Data Science Roadmap 2025

**Mathematics**

**Linear Algebra**

* Understand vectors, matrices, eigenvalues, and eigenvectors.
* 📘 Resource: \*Essence of Linear Algebra\* by 3Blue1Brown.
* 📺 YouTube: https://www.youtube.com/playlist?list=PLZHQObOWTQDMsr9K-rj53DwVRMYO3t5Yr

**Statistics**

* Learn descriptive statistics, inferential statistics, and hypothesis testing.
* 📘 Resource: \*Statistics for Data Science\* by James D. Miller.
* 📺 YouTube: https://www.youtube.com/user/joshstarmer

**Probability**

* Study probability distributions, Bayes' theorem, and random variables.
* 📘 Resource: \*Introduction to Probability\* by Joseph K. Blitzstein.
* 📺 YouTube: https://www.youtube.com/playlist?list=PL1328115D3D8A2566

**Programming**

**Python or R**

* Focus on Python for its extensive libraries in data science.
* 📘 Resource: \*Python for Data Analysis\* by Wes McKinney.
* 📺 YouTube: https://www.youtube.com/playlist?list=PL-osiE80TeTt2d9bfVyTiXJA-UTHn6WwU

**SQL**

* Learn to query databases, use joins, and aggregate functions.
* 📘 Resource: \*Learning SQL\* by Alan Beaulieu.
* 📺 YouTube: https://www.youtube.com/watch?v=HXV3zeQKqGY

**Feature Engineering**

* Understand techniques like one-hot encoding, normalization, and handling missing values.
* 📘 Resource: \*Feature Engineering for Machine Learning\* by Alice Zheng.
* 📺 YouTube: https://www.youtube.com/results?search\_query=feature+engineering+for+machine+learning

**Data Visualization**

* Learn to create insightful visualizations using tools like Matplotlib, Seaborn, and Tableau.
* 📘 Resource: \*Storytelling with Data\* by Cole Nussbaumer Knaflic.
* 📺 YouTube: https://www.youtube.com/watch?v=0P7QnIQDBJY

**Machine Learning**

* Study supervised and unsupervised learning algorithms.
* 📘 Resource: \*Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow\* by Aurélien Géron.
* 📺 YouTube: https://www.youtube.com/watch?v=Gv9\_4yMHFhI

**Deep Learning**

* Dive into neural networks, CNNs, RNNs, and frameworks like TensorFlow and PyTorch.
* 📘 Resource: \*Deep Learning\* by Ian Goodfellow.
* 📺 YouTube: https://www.youtube.com/playlist?list=PLkDaE6sCZn6Ec-XTbcX1uRg2\_u4xOEky0

**MLOps**

* Understand model deployment, CI/CD pipelines, and monitoring.
* 📘 Resource: \*Introducing MLOps\* by Mark Treveil.
* 📺 YouTube: https://www.youtube.com/watch?v=06-AZXmwHjo

**Big Data**

* Learn about Hadoop, Spark, and data processing at scale.
* 📘 Resource: \*Big Data: Principles and Best Practices\* by Nathan Marz.
* 📺 YouTube: https://www.youtube.com/watch?v=3fiBzU3kHzY

**Cloud Computing**

* Familiarize yourself with AWS, Azure, or Google Cloud for deploying data solutions.
* 📘 Resource: \*Cloud Computing: Concepts, Technology & Architecture\* by Thomas Erl.
* 📺 YouTube: https://www.youtube.com/watch?v=ulprqHHWlng