Complete Data Science Roadmap

This roadmap is designed to provide a step-by-step guide for becoming a data scientist. Each week focuses on specific skills and concepts, with detailed explanations to help you build a strong foundation in data science. Below is the weekly breakdown of topics and subtopics to cover throughout your learning journey.

Week 1-2: Introduction to Data Science and Python Basics

Introduction to Data Science: roles, tools, and workflows.

Python basics: data types, loops, conditionals, functions, and libraries (NumPy, Pandas).

Week 3-4: Data Wrangling and Preprocessing

Handling missing data, scaling, encoding, and feature engineering.

Week 5-6: Exploratory Data Analysis (EDA) and Data Visualization

Techniques to understand and visualize data: Matplotlib, Seaborn.

Week 7-8: Probability and Statistics for Data Science

Descriptive and inferential statistics, probability theory, and distributions.

Week 9-10: Machine Learning Fundamentals

Supervised vs. unsupervised learning, model evaluation, and overfitting.

Week 11-12: Regression and Classification Algorithms

Detailed study of linear regression, logistic regression, decision trees, etc.

Week 13-14: Unsupervised Learning

Clustering (K-means, hierarchical), dimensionality reduction (PCA).

Week 15-16: Advanced Machine Learning and Model Optimization

Hyperparameter tuning, cross-validation, and model selection.

Week 17-18: Time Series Analysis and Forecasting

Time series decomposition, ARIMA, Prophet model.

Week 19-20: Natural Language Processing (NLP)

Text preprocessing, sentiment analysis, and topic modeling.

Week 21-24: Deep Learning Basics

Introduction to neural networks, Keras, and TensorFlow basics.

Week 25-28: Real-World Project Development

End-to-end data science project including data collection, EDA, model building, and deployment.