**Day 1-15: Python Basics and Introduction to Data Science**

* **Day 1-2**: Introduction to Data Science and Overview of the Field
* **Day 3-4**: Python Basics - Syntax, Variables, Data Types
* **Day 5-6**: Control Flow: Conditional Statements, Loops
* **Day 7-8**: Functions in Python (Arguments, Return Values)
* **Day 9-10**: Working with Python Libraries (NumPy, Pandas)
* **Day 11-12**: File Handling in Python (Reading, Writing, File Operations)
* **Day 13-14**: Error Handling in Python (Try, Except, Finally)
* **Day 15**: Object-Oriented Programming (Classes, Objects)

**Day 16-30: Python Libraries for Data Science**

* **Day 16-17**: Introduction to NumPy (Arrays, Operations)
* **Day 18-19**: NumPy (Array Indexing, Broadcasting, Math Functions)
* **Day 20-21**: Pandas Basics (Series, DataFrames)
* **Day 22-23**: Pandas Data Manipulation (Filtering, Sorting, Aggregating)
* **Day 24-25**: Data Cleaning (Handling Missing Data, Dropping Duplicates)
* **Day 26-27**: Data Merging, Joining, Concatenation in Pandas
* **Day 28-29**: Data Visualization with Matplotlib (Basic Plots)
* **Day 30**: Data Visualization with Seaborn (Heatmaps, Box Plots)

**Day 31-45: Data Preprocessing and Statistical Concepts**

* **Day 31-32**: Data Cleaning (Handling Outliers, Scaling Data)
* **Day 33-34**: Feature Engineering (Encoding Categorical Data, Feature Selection)
* **Day 35-36**: Introduction to Statistics for Data Science
* **Day 37-38**: Descriptive Statistics (Mean, Median, Mode, Variance)
* **Day 39-40**: Probability Distributions (Normal, Binomial, Poisson)
* **Day 41-42**: Hypothesis Testing (t-tests, z-tests, p-values)
* **Day 43-44**: Confidence Intervals and ANOVA (Analysis of Variance)
* **Day 45**: Correlation, Covariance, and Causality

**Day 46-60: SQL and Databases**

* **Day 46**: Introduction to SQL and Databases (Relational vs Non-relational)
* **Day 47-48**: Basic SQL Queries (SELECT, WHERE, ORDER BY)
* **Day 49-50**: SQL Data Manipulation (INSERT, UPDATE, DELETE)
* **Day 51-52**: SQL Aggregation Functions (COUNT, SUM, AVG, GROUP BY)
* **Day 53-54**: SQL Joins (INNER, LEFT, RIGHT, FULL OUTER)
* **Day 55-56**: Subqueries in SQL (WHERE, FROM, SELECT clauses)
* **Day 57-58**: SQL Advanced Techniques (Indexing, Window Functions)
* **Day 59**: SQL Optimization and Performance Tuning
* **Day 60**: SQL in Data Science Workflow (Integration with Python)

**Day 61-75: Supervised Machine Learning**

* **Day 61-62**: Introduction to Machine Learning (Supervised vs Unsupervised)
* **Day 63-64**: Linear Regression (Simple, Multiple)
* **Day 65**: Evaluation Metrics for Regression (MSE, RMSE)
* **Day 66-67**: Regularization: Ridge and Lasso Regression
* **Day 68-69**: Logistic Regression (Binary Classification)
* **Day 70-71**: Evaluation Metrics for Classification (Accuracy, ROC Curve, AUC)
* **Day 72-73**: Decision Trees (Building, Visualizing)
* **Day 74-75**: Random Forests and Feature Importance

**Day 76-90: Unsupervised Machine Learning**

* **Day 76-77**: K-Means Clustering (Basic Theory and Implementation)
* **Day 78-79**: Hierarchical Clustering
* **Day 80**: DBSCAN (Density-Based Spatial Clustering)
* **Day 81-82**: Principal Component Analysis (PCA) for Dimensionality Reduction
* **Day 83-84**: Advanced Dimensionality Reduction (t-SNE, UMAP)
* **Day 85-86**: Association Rule Learning (Apriori Algorithm)
* **Day 87**: Anomaly Detection Techniques (Isolation Forest, One-Class SVM)
* **Day 88-89**: Recommender Systems (Collaborative and Content-Based Filtering)
* **Day 90**: Autoencoders and Unsupervised Feature Learning

**Day 91-105: Deep Learning and Neural Networks**

* **Day 91-92**: Introduction to Deep Learning (Neural Networks Basics)
* **Day 93**: Activation Functions (ReLU, Sigmoid, Tanh)
* **Day 94-95**: Backpropagation and Gradient Descent
* **Day 96-97**: Convolutional Neural Networks (CNNs)
* **Day 98-99**: CNNs for Image Classification and Object Detection
* **Day 100**: Recurrent Neural Networks (RNNs) and LSTMs
* **Day 101-102**: Advanced RNN Techniques (GRUs, Bidirectional RNNs)
* **Day 103-104**: Generative Adversarial Networks (GANs)
* **Day 105**: Transfer Learning with Pre-trained Models

**Day 106-110: Model Deployment and Optimization**

* **Day 106**: Introduction to Model Deployment (Flask, Streamlit)
* **Day 107-108**: Deploying Models with Flask API
* **Day 109**: Introduction to Docker and Containerization
* **Day 110**: Dockerizing ML Models

**Day 111-115: Big Data and Cloud Computing**

* **Day 111-112**: Introduction to Big Data (Hadoop, Spark)
* **Day 113**: Data Processing with PySpark
* **Day 114**: Introduction to Cloud Platforms (AWS, GCP, Azure)
* **Day 115**: Deploying ML Models on Cloud Platforms (AWS Sagemaker, GCP AI)

**Day 116-120: Advanced Topics and Capstone Project**

* **Day 116**: Reinforcement Learning (Basics, Q-Learning)
* **Day 117**: Time Series Forecasting (ARIMA, Prophet)
* **Day 118**: Hyperparameter Optimization (Grid Search, Random Search)
* **Day 119**: Capstone Project: Problem Definition and Data Collection
* **Day 120**: Capstone Project: Final Model and Deployment

**Additional Topics Covered:**

1. **SQL and Databases**: Full SQL coverage including optimization and integration with Python.
2. **Machine Learning**: Supervised learning, unsupervised learning, and advanced algorithms.
3. **Deep Learning**: Neural networks, CNNs, RNNs, GANs, and Transfer Learning.
4. **Deployment**: Model deployment with Flask, Docker, and cloud platforms.
5. **Big Data**: Introduction to Spark and Hadoop.
6. **Advanced Techniques**: Reinforcement Learning, Time Series, Hyperparameter Tuning

 **Day 121-130: Advanced Machine Learning and Statistics**

* **Day 121-122**: Bayesian Statistics and Markov Chains
* **Day 123-124**: Advanced Machine Learning (SVM, Ensemble Learning)
* **Day 125-126**: Time Series Analysis and Forecasting (ARIMA, GARCH)
* **Day 127-128**: Experimental Design and A/B Testing

 **Day 131-140: Advanced Deep Learning**

* **Day 131-132**: Attention Mechanisms and Transformers (e.g., BERT, GPT)
* **Day 133-134**: Deep Reinforcement Learning (Advanced RL Algorithms)
* **Day 135-136**: Graph Neural Networks (GNN)
* **Day 137-138**: Self-supervised Learning and NLP Models (BERT, GPT)
* **Day 139-140**: Generative Models (GANs, Variational Autoencoders)

 **Day 141-150: NLP and Computer Vision**

* **Day 141-142**: NLP Advanced Techniques (NER, Text Summarization)
* **Day 143-144**: Sequence-to-Sequence Models (T5, GPT)
* **Day 145-146**: Object Detection (YOLO, Faster R-CNN)
* **Day 147-148**: Image Segmentation and Image Generation (U-Net, GANs)
* **Day 149-150**: Style Transfer and Deep Dream

 **Day 151-160: Data Engineering and MLOps**

* **Day 151-152**: ETL Processes and Data Pipelines (Luigi, Dask)
* **Day 153-154**: Data Warehousing Concepts (BigQuery, Redshift)
* **Day 155-156**: MLOps: Version Control for Models (DVC, MLflow)
* **Day 157-158**: Continuous Integration and Deployment (CI/CD for ML)
* **Day 159-160**: Model Monitoring and Maintenance in Production

 **Day 161-170: Cloud and Ethics**

* **Day 161-162**: Using AWS, GCP, and Azure for Data Science
* **Day 163-164**: Cloud-based Data Warehousing and Scalable Training
* **Day 165-166**: Ethics in Data Science and Responsible AI
* **Day 167-168**: Bias, Fairness, and Privacy-preserving ML
* **Day 169-170**: AI Governance, Privacy, and Federated Learning

Interview preparation

Kaggle

Interview query

Leetcode

Hacker rank

Machine hack

Brilliant .org