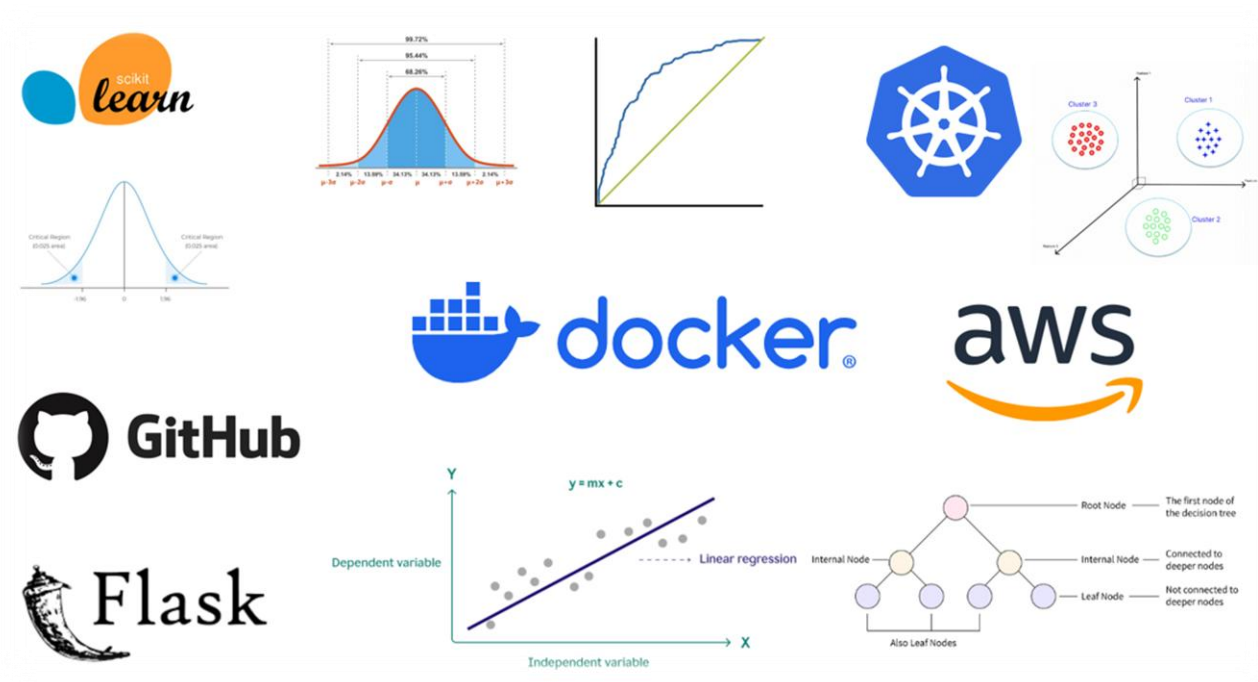


Machine Learning in Python with ML Ops.



Trainer & Career Counsellor

Saiful Hoda, Exeter MBA, B. Tech. in Computer Science

Ex. Citibank, Refinitiv, Virtu Financials and Nomura Holdings (Hong Kong)

Overview

It is expected that you possess a good understanding of Core concepts in Python and have completed the course on Data Analytics in Python before you begin with Data Sciences in Python.

This is one of the most comprehensive courses out there and along with conceptual understanding, also provides hand on learning experience through practical real-world projects.

Along with Data preprocessing, Model building, evaluation and fine tuning; the course also teaches you deployment and maintenance of Machine learning models. The python libraries and tools taught throughout the course are high in demand.

Upon gaining mastery of the topics in the course, you become a complete Data Scientist in Python. We further help you in shaping your resume and interview preparation, until you ace your dream job.

All the best.

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1. Understanding Machine Learning

- 1.1. Data is Your Foundation and Your Biggest Challenge
- 1.2. Clearly Define the Problem Before Coding
- 1.3. Understand the Main Learning Paradigms
- 1.4. ML Development is an Iterative Process
- 1.5. Metrics Matter More Than Just "Accuracy"
- 1.6. Beware of Overfitting and Underfitting:
- 1.7. Feature Engineering is Often the Key to Breakthroughs
- 1.8. Consider Bias and Ethics
- 1.9. Embrace Continuous Learning

2. Simple Linear Regression

2.1. Background

- 2.1.1. Line of Regression
- 2.1.2. Line of Best Fit
- 2.1.3. Assumptions of a simple linear regression
- 2.1.4. Understanding the Data
- 2.1.5. Hypothesis Testing
- 2.1.6. Let is Build a Linear model
- 2.1.7. Linear Regression in Python using SK Learn
- 2.1.8. Questions for the Interview

2.2. Gradient Descent Linear Regression

- 2.2.1. Linear Regression Cost Function
- 2.2.2. Optimisation Methods
- 2.2.3. Learning Rate
- 2.2.4. Gradient Descent in Python
- 2.2.5. Practise Questions

3. Multiple Linear Regression

- 3.1. Introduction
- 3.2. Multicollinearity
- 3.3. Dealing with Categorical values
- 3.4. Model Assessment and Comparison
- 3.5. Feature Selection
- 3.6. Multiple Linear Regression in Python
- 3.7. Understanding the Data
- 3.8. Preparing the Data
- 3.9. Building the Model
- 3.10. Residual Analysis and Prediction
- 3.11. Variable Selection using RFE
- 3.12. Summarise out learning
- 3.13. Questions for the interview
- 3.14. Where are Logistic models used in the industry
- 3.15. Prediction versus Projection
- 3.16. Case Study

4. Logistic Regression'

- 4.1. Univariate Logistic Regression
- 4.2. Binary Classification
- 4.3. Sigmoid Curve
- 4.4. Finding the Best fit Sigmoid curve
- 4.5. Odds and Log Odds
- 4.6. Summarise

5. Multi-variate Logistic Regression in Python using a Case Study

- 5.1. Data Cleaning and Transformation
- 5.2. Building a Logistic model
- 5.3. Feature elimination using RFE
- 5.4. Confusion Matrix and Accuracy
- 5.5. Manual Feature elimination
- 5.6. Summarize our Learning

6. Model Evaluation

Introduction

Metric Beyond Accuracy: Sensitivity and Specificity

Sensitivity and Specificity in Python

Understanding the ROC curve

ROC Curve in Python

Finding the Optimal Threshold

Precision and Recall

Making Predictions

Summarise our Learning

7. Multi classification using Logistic Regression

- 7.1. Introduction
- 7.2. Business Examples
- 7.3. Business Versus Multiclass Classification
- 7.4. One versus One
- 7.5. One versus Rest
- 7.6. Application on an Industry Problem
- 7.7. Understanding of Business Problem Statement
- 7.8. Application of One versus Rest Classifier
- 7.9. Analysing the Model Parameters
- 7.10. Understanding the internal mathematics
- 7.11. Application of One versus One classifier
- 7.12. Summary

8. Industry applications of Logistic Regression

- 8.1. Commonly faced challenges in Implementation
- 8.2. A closer look at Model Evaluation
- 8.3. Model validation and importance of stability
- 8.4. Tracking of model performance over time
- 8.5. Summary of Learnings

9. Tree Models

- 9.1. Introduction to decision trees
- 9.2. Interpreting a Decision Tree
- 9.3. Building decision trees
- 9.4. Decision Tree classifier in Python
- 9.5. Tree models over linear models
- 9.6. Algorithms for Decision tree construction
- 9.7. Spitting and Homegeneity
- 9.8. Impurity measures
- 9.9. The Gini Index
- 9.10. Introduction to Hyperparameter Tuning iun Decision Trees
- 9.11. Disadvantages of Decision Trees
- 9.12. Tree Truncation
- 9.13. Building decision trees in Python
- 9.14. Choosing Tree Hyperparameters in Python
- 9.15. Decision Tree Regression in Python
- 9.16. Question and Practise

10. Ensemble and Random Forests

- 10.1. Ensemble
- 10.2. Example of some popular Ensembles
- 10.3. Introduction to Random Forests
- 10.4. Comprehension – Out Of Bag Error
- 10.5. Feature Importance in Random Forests
- 10.6. Random Forests in Python
- 10.7. Random Forests Regression in Python
- 10.8. Case Study - Telecom Churn Prediction

11. Clustering: Unsupervised Learning

- 11.1. Introduction
- 11.2. Understanding to Clustering
- 11.3. Customer Segmentation as an example of clustering

12. K-Means Clustering

- 12.1. Introduction
- 12.2. Euclidean Distance
- 12.3. Centroid
- 12.4. Steps of the Algorithm
- 12.5. K-Means algorithm
- 12.6. K Means ++ Algorithm
- 12.7. Visualizing the K Means algorithm
- 12.8. Practical consideration in K Means algorithm
- 12.9. Cluster Tendency
- 12.10. Practise and Questions

13. Let us build a K-means algorithm in Python

- 13.1. Introduction
- 13.2. Data understanding and Cleaning
- 13.3. Data Preparation
- 13.4. Creating clusters
- 13.5. Optimal number of clusters
- 13.6. Cluster Analysis
- 13.7. Other Behavioural Segmentation Types
- 13.8. Summary and Practise

14. Hierarchical Clustering

- 14.1. Introduction
- 14.2. Hierarchical Clustering Algorithm
- 14.3. Interpreting the Dendrogram
- 14.4. Types of Linkages
- 14.5. Hierarchical Clustering in Python
- 14.6. Industry Insights

15. Other Forms of Clustering

- 15.1. K mode Clustering
- 15.2. K mode in Python
- 15.3. K Prototype in Python
- 15.4. DB scan clustering
- 15.5. Practise and Exercise

16. Model Selection

- 16.1. Introduction to Model Selection
- 16.2. Model and Learning Algorithm
- 16.3. Simplicity, Complexity and Overfitting
- 16.4. Bias-Variance Trade-off
- 16.5. Regularization
- 16.6. Summary and Practise

17. Model Evaluation

- 17.1. Regularization versus Hyper parameters
- 17.2. Model Evaluation and Cross Validation
- 17.3. Model Evaluation example in Python
- 17.4. Cross Validation
- 17.5. Cross Validation in Python
- 17.6. Cross Validation – Hyperparameter Tuning

18. Boosting

- 18.1. Introduction
- 18.2. Ensemble models
- 18.3. Introduction to Boosting
- 18.4. Weak learners
- 18.5. Introduction to Ada Boost algorithm
- 18.6. Adaboost Distribution and Parameter Calculation

19. Gradient Boosting

- 19.1. Introduction
- 19.2. Understanding to Gradient Boosting
- 19.3. Gradient in Gradient Boosting
- 19.4. Understanding XG Boost algorithm

20. Unsupervised Learning (PCA)

- 20.1. Introduction to PCA
- 20.2. Vectorial Representation of PCA
- 20.3. Vector Operations
- 20.4. Matrix multiplication
- 20.5. Basis
- 20.6. Change of Basis- Introduction, Demonstration and Calculation
- 20.7. Introduction to Variance
- 20.8. Directions of Maximum Variance
- 20.9. The working of PCA
- 20.10. Covariance Matrix
- 20.11. Transforming the Covariance matrix
- 20.12. Eigen decomposition
- 20.13. PCA in Python
- 20.14. Scree Plots
- 20.15. Dimensionality Reduction
- 20.16. Improve Performance Model

21. Deploying a Machine Learning Model

21.1. Introduction

- 21.1.1. Machine learning Pipeline
- 21.1.2. Software Architecture of Deployment

21.2. Introduction to Git and GitHub

- 21.2.1. Version Control Systems
- 21.2.2. Introduction to Git and GitHub
- 21.2.3. GitHub installation and Configuration
- 21.2.4. Branch, Commit, Merge and Pull

21.3. Deploying ML models in Production as APIs

- 21.3.1. API
- 21.3.2. REST
- 21.3.3. Deployment of a Data set
- 21.3.4. Deployment of a Model

21.4. Deploying ML model using Flask and Docker

- 21.4.1. What is Docker
- 21.4.2. Terminologies of Docker
- 21.4.3. Docker Installation
- 21.4.4. Dockerise a Flask application
- 21.4.5. Docker CLI commands
- 21.4.6. Deploy an ML model using Dockers

21.5. Deploying an ML model on AWS (IaaS)

21.5.1. Introduction to AWS

21.5.2. Applications and Advantages of AWS Service

21.5.3. Deploying the Object Identification Model

22. Project Work

- Build and Deploy a Machine learning model
- Industry relevant use cases

23. Resume Preparation and Job Search
