



Quantum Learnings & Knowledge Solutions India

Machine Learning & Artificial Intelligence

Syllabus

Online Course Information

Coding :

1. Basics of Coding:
 - 1.1 What are variables
 - 1.2 What are operators
 - 1.3 Data types in Python
 - 1.4 Print command
 - 1.5 If-else, loops introduction and small programs
2. Intermediate coding
 1. Conditional statements (if-else, elif)
 2. Nested conditions
 3. For loop
 4. While loop
 5. Break
3. Introduction to Functions
 - 3.1. Using prebuilt functions (min,max etc.)
 - 3.2. Writing user defined functions
 - 3.3. What is lambda function?
 - 3.4. Map, reduce & Filter functions in Python
4. Introduction to libraries
 1. NumPy
 2. Pandas
 3. Matplotlib
 4. Plotly

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Machine learning:

1. What is machine learning.
2. AI vs ML vs DL.
3. How does machine learning work?
4. Types of machine learning.
 - a. Supervised Learning with example.
 - b. Unsupervised Learning with example.
 - c. Reinforcement Learning with example.
5. Jupyter Notebook Tutorial and Installation.

Algorithm

1. Linear Regression with one variable and multiple variables.
 - a. Model Representation.
 - b. Cost function.
 - c. Gradient descent algorithm.
 - d. Use case with model development.
2. Logistic Regression.
 - a. Model Representation.
 - b. Decision Boundary.
 - c. Cost function.
 - d. Gradient descent algorithm.
 - e. Use case with model development.
3. Regularization.
 - a. The problem of Over fitting.
 - b. Cost Function.
 - c. Regularized Linear regression.
 - d. Regularized Logistic regression.
4. Support Vector Machine.
 - a. Optimization Objective.
 - b. Large margin intuition and mathematics behind it.
 - c. Kernel.
 - d. Use case with model development.
5. Dimensionality reduction.
 - a. Data compression and Visualization.
 - b. Principle component analysis and its algorithm.
 - c. Choosing the number of principle components.
 - d. Reconstruction from compressed data.
 - e. Use case with model development.
6. Anomaly Detection.
 - a. Gaussian distribution and its algorithm.
 - b. Developing and evaluating anomaly detection.
 - c. Choosing what features to use.
 - d. Use case with model development.
7. Recommender System
 - a. Problem formulation.
 - b. Content based recommendation.

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- c. Collaborative filtering.
- d. Use case with model development.
- 8. Neural Networks
 - a. Nonlinear Hypothesis.
 - b. Model Representation.
 - c. Cost Function.
 - d. Backward Propagation.
 - e. Use case with model development.

MODEL EVALUATION

- 5. Feature Engineering
- 6. Model Selection
- 7. Model Evaluation Metrics
 - 11.1. Accuracy
 - 11.2. RMSE
 - 11.3. ROC
 - 11.4. AUC
 - 11.5. Confusion Matrix
 - 11.6. Precision
 - 11.7. Recall
 - 11.8. F1 Score
 - 11.9. Over fitting
 - 11.10. Bias-Variance trade-off
 - 11.11. Cross Validation

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Projects

Machine Learning Interview Questions