Roadmap of Applied Data Science with Machine Learning

Data Science Level 2:

Duration: 6 Months

1. **Statistics Fundamentals**
    - Sampling
    - Variables in Statistics
    - Frequency Distributions
    - Visualizing Frequency Distributions
    - Comparing Frequency Distributions
2. **Statistics Intermediate: Averages and Variability**
    - The Mean
    - The Weighted Mean and the Median
    - The Mode
    - Measures of Variability
    - Z-scores
3. **Probability in Python**
    - Estimating Probabilities
    - Probability Rules
    - Solving Complex Probability Problems
    - Permutations and Combinations
4. **Hypothesis Testing**
    - Significance Testing
    - Chi-squared tests
    - Multi category chi-squared tests

MACHINE LEARNING

5. **Machine Learning Fundamentals**
    - Introduction to K-Nearest Neighbors
    - Evaluating Model Performance
    - Multivariate K-Nearest Neighbors
    - Hyperparameter Optimization
    - Cross Validation

6. **Calculus for Machine Learning**
    - Understanding Linear and Nonlinear Functions
    - Understanding Limits
    - Finding Extreme Points
7. **Linear Algebra for Machine Learning**
    - Linear Systems
    - Vectors
    - Matrix Algebra
    - Solution Sets
8. **Linear Regression for Machine Learning**
    - Machine Learning
    - The Linear Regression Model
    - Feature Selection • Gradient Descent
    - Ordinary Least Squares
    - Processing and Transforming Features
9. **Logistic Regression for Machine Learning:**
    - The Logistic Regression Model
    - Evaluating binary classifiers
    - Multiclass classification
    - Overfitting 5. Clustering
    - K-means clustering
10. **Decision Trees and Random Forests**
    - Introduction to Decision Trees
    - Building a Decision Tree
    - Applying Decision Trees
    - Applying Random Forests
11. **Deep Learning**
    - Representing Neural Networks
    - Nonlinear Activation Functions
    - Hidden Layers