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আপনি যদি শূন্য থেকে মেশিন লার্নিং শিখতে চান, তাহলে শুধুমাত্র এই গাইডলাইনটি অনুসরণ করলেই আপনার যাত্রা সুন্দর হবে, ইনশাআল্লাহ।

1. Programming Skills:

- Python: Most commonly used in machine learning for its simplicity and the vast availability of libraries (like NumPy, Pandas, Matplotlib, Scikit-learn, TensorFlow, and PyTorch).
- SQL: For data manipulation and retrieval.

2. Mathematics:

- **Statistics and Probability:** Descriptive statistics, Understanding distributions, Statistical tests, Bayesian concepts, and Probability theories.
- **Linear Algebra:** Concepts like matrices, vectors, norms, eigenvalues, eigenvectors, and Gaussian elimination, and their operations are crucial.
- **Calculus:** Essential for understanding the optimization techniques used in machine learning algorithms.

3. Data Handling:

- **Data Preprocessing:** Techniques for cleaning and preparing data for analysis (Pandas, Numpy, Polars, SciPy).
- **Data Visualization:** Skills in tools and libraries for visualizing data to extract insights (Matplotlib, Plotly, Seaborn, Holoviews, hvPlot).

4. Machine Learning & Deep Learning Algorithms:

- **Supervised Learning:** Linear Regression, Logistic Regression, KNN, Polynomial Regression, SVM, Decision trees, Random forests, Lasso, Ridge, XgBoost, AdaBoost, CatBoost, AR, MA, ARIMA, Prophet, CNN, ANN, RNN, LSTM, GRU, BERT, GPT, T5, etc.
- **Unsupervised Learning:** Clustering, Principal component analysis (PCA), LDA, Anomaly Detection.
- **Reinforcement Learning:** Algorithms like Q-learning, SARSA, and Deep Reinforcement Learning.

- **Tuning and Optimization:** Techniques like gradient descent, backpropagation, and hyperparameter tuning.
- **Natural Language Processing:** Techniques and models for text data understanding and generation.

6. Machine Learning Theory:

- **Bias-Variance Tradeoff:** Understanding the trade-offs between Overfitting and Underfitting, Bias, Variance.
- **Evaluation Metrics:** Accuracy, precision, recall, F1 score, ROC curve, etc.
- **Model Selection and Validation:** Techniques like cross-validation and grid search.
- **Regularization:** L1 Regularization, L2 Regularization.
- **Imbalance Dataset:** Oversampling, Undersampling, SMOTE.

7. Practical Applications:

- **Project Experience:** Hands-on experience through projects or internships.
- **Problem Solving:** Ability to apply machine learning techniques to solve real-world problems.
- **Ethics and Privacy:** Understanding the ethical implications and privacy concerns in deploying machine learning models.

8. Staying Updated:

- **Continued Learning:** Machine learning is a rapidly evolving field, so staying updated with the latest research, tools, and best practices is crucial.
- **Participation in Competitions:** Platforms like Kaggle offer a way to practice and enhance your skills competitively.
- **Knowledge Sharing:** You can share your knowledge on Linkedin.

Learning Resources:

- How to Learn?
- Free Resources
- Paid Resources