1. **Programming Skills:**
    a. **Python:** Most commonly used in machine learning for its vast availability of libraries like(Pandas, NumPy, Matplotlib, Scikit-learn, TensorFlow and PyTorch)
    b. SQL for data manipulation and retrieval.
2. **Mathematics:**
    a. **Statistics and Probability:** Descriptive Statistics, Understanding Distributions, Statistical test, Bayesian concepts and Probability theories.
    b. **Linear Algebra:** Concepts like matrices, vectors, norms, eigenvalues, eigenvectors, Gaussian Elimination and their operations are crucial.
    c. **Calculus:** Essential for understanding the optimization techniques used in machine learning algorithms.
3. **Data Handling:**
    a. **Data Preprocessing:** Techniques for cleaning and preparing data for analysis (Pandas, NumPy, Polars, SciPy).
    b. **Data Visualization:** Skills in tools and libraries for visualizing data to extract insights (Matplotlib, Plotly, Seaborn, Holoviews, hvPlot).
4. **Machine Learning & Deep Learning Algorithms:**
    a. **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.
    b. **Unsupervised Learning:** Clustering, Principal component analysis (PCA), LDA, Anomaly Detection.
    c. **Reinforcement Learning:** Algorithms like Q-learning, SARSA, and Deep Reinforcement Learning.
    d. **Tuning and Optimization:** Techniques like gradient descent, backpropagation, and hyperparameter tuning.
    e. **Natural Language Processing:** Techniques and models for text data understanding and generation.
5. **Machine Learning Theory:**
    a. **Bias-Variance Tradeoff:** Understanding the trade-offs between Overfitting and Underfitting, Bias, Variance.
    b. **Evaluation Metrics:** Accuracy, precision, recall, F1 score, ROC curve, etc.
    c. **Model Selection and Validation:** Techniques like cross-validation and grid search.
    d. **Regularization:** L1 Regularization, L2 Regularization.
    e. **Imbalance Dataset:** Oversampling, Under sampling, SMOTE.
6. **Practical Applications:**
    a. **Project Experience:** Hands-on experience through projects or internships.
    b. **Problem Solving:** Ability to apply machine learning techniques to solve real-world problems.
    c. **Ethics and Privacy:** Understanding the ethical implications and privacy concerns in deploying machine learning models.

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