If you are seriously interested in AI/ML

1. **Programming**: Python (Core & Data Science), SQL, and deep learning frameworks like PyTorch/TensorFlow

2. **Statistics & Probability**: Hypothesis testing, Mean, Median, Mode, Variance, Standard Deviation, Quartiles, Bayesian vs Frequentist, Correlation vs Causation p-values, Confidence intervals, Type I/II errors, Random sampling, Stratified sampling, Sampling bias, Probability distributions (normal, binomial, Poisson), Conditional probability, Bayes' theorem

3. **Data Wrangling & EDA**: Cleaning, transforming, and preparing data for analysis

4. **Data Visualization**: Tools like Matplotlib, Seaborn, Tableau or Power BI

5. **Feature Engineering**: Creating and selecting meaningful features from raw data

6. **Machine Learning**

- **Supervised Learning:** Regression (Linear/polynomial regression, regularization (Ridge, Lasso), logistic regression), Classification (Decision Trees, Random Forests, SVM, Naive Bayes, K-NN), Ensemble Methods(Bagging, Boosting (XGBoost, LightGBM), Stacking)
- **Unsupervised Learning:** Clustering (K-means, Hierarchical Clustering, DBSCAN), Dimensionality Reduction (PCA, t-SNE etc)
- **Time Series Analysis: F**orecasting Methods (ARIMA, seasonal decomposition, exponential smoothing), Time Series Features (Trend, seasonality, stationarity, autocorrelation), Modern Approaches (Prophet, LSTM for time series)

7. **Deep Learning Fundamentals:** Neural Networks (Perceptrons, backpropagation, activation functions), Architectures (CNNs (computer vision), RNNs/LSTMs (sequences), Transformers),Training Techniques (Gradient descent variants, batch normalization, dropout)

8. **Model Evaluation & Selection:**

- **Metrics:** Accuracy, precision, recall, F1-score, ROC-AUC, RMSE, MAE
- **Validation:** Train/validation/test splits, cross-validation, stratified sampling
- **Model Selection:** Bias-variance tradeoff, overfitting/underfitting, hyperparameter tuning
- **Performance Analysis:** Learning curves, confusion matrices, feature importance

9. **Big Data Tech**: Spark, or cloud data platforms (AWS, Azure, GCP)

10. **Database Knowledge**: Relational (SQL) and NoSQL databases

11. **Mathematics**: Linear algebra, calculus (basics relevant to ML/LLM algorithms), Optimization (Gradient descent, local/global minima, cost functions), Understanding floating-point arithmetic, numerical stability

12. **Communication**: Ability to explain findings clearly to technical and non-technical audiences

13. **Domain Knowledge**: Understanding of the specific industry you work in

14. **Version Control**: Git and collaboration workflows

15. **Cloud Computing**: Deploying models and workflows on cloud infrastructure

16. **Experimentation**: A/B testing and designing experiments

17. **MLOPs**: Model deployment, monitoring & lifecycle management

18. **GenAI**: NLP & Transformer fundamentals, Working with LLMs, Prompt engineering, RAG, Vector Databases, Embedding Models, Multimodal, Model Optimisation Agentic AI, Fine-tuning open-source models, evaluation