Artificial Intelligence & Data Science

1. Artificial Intelligence
   - 1. Scope
     - Data Science
     - Machine Learning
     - Artificial Intelligence
   - 2. Definition
     - Learn From Data & Solves Problem
       - Strong AI
       - Weak AI
   - 3. Data & Concept
     - Human can Analyze, Identify Pattern & Make Decisions
       - Numerical Data — Machine Learning & Deep Learning
     - Human Can Listen & Speak
       - Text/Audio Data — Machine Learning & Natural Language Processing
     - Human Can See & Recognize
       - Image/Video Data — Computer Vision & Deep Learning
2. Clarity about Studies
   - Data Analytics
     - Pre-processing, analysing, visualizing
     - Data analytics deals with finding patterns based on past data to predict future events
   - Machine Learning
   - Deep Learning
   - Data Science
3. Machine Learning
   - 1. Definition
     - Machine learning is a subset of artificial intelligence that enables computers to learn and make predictions or decisions from data without explicit programming.
   - 2. Types
     - Supervised Learning
       - 1. Features & Labels
         - ✓ IPL
         - ✓ YELLOW
         - ✓ CAPTAIN
         - ✓ WICKET KEEPER
         - Dhoni
         - ✓ IPL
         - ✓ BLUE
         - ✓ CAPTAIN
         - ✓ BATSMAN
         - Rohit
       - 2. Classification
         - Machine learning classification is a method where a computer learns to assign predefined labels to input data, enabling it to categorize or predict the class of new, unseen data.
         - Output - Classes
         - Classification
           - Cat
           - Dog
           - Output Cat
           - Steps
             - Gathering Data
             - Data Preprocessing
             - Choosing an Classifier(Algorithm)
               - Algorithms
                - K-Nearest Neighbour
                - Logistic Regression
                - Decision Tree
                - Support Vector Machine
                - Naive Bayes
                - Random Forest
                - Linear Regression
             - Model Training
             - Model Evaluation
               - Holdout Method
               - Cross Validation
               - ROC Curve(Receiver Operating Characteristics)
               - Classification Reports
             - Parameter Tuning - Optional
             - Model Prediction
       - 3. Regression
         - Machine learning regression is a method in which a computer learns to predict numerical outcomes from features, establishing a continuous relationship between variables.
         - Output - Values
         - Regression

Number of bedroom	Selling price
1	2,00,000
2	4,00,000
3	6,00,000
4	8,00,000
           - Steps
             - Gathering Data
             - Data Preprocessing
             - Choosing an Regressor(Algorithm)
               - Algorithms
                - Logistic Regression
                - Linear Regression
                - Polynomial Regression
             - Model Training
             - Model Evaluation
               - Mean Absolute Error (MAE)
               - Mean Squared Error (MSE)
               - Root Mean Squared Error (RMSE)
               - R-squared (R²)
             - Parameter Tuning - Optional
             - Model Prediction
     - Unsupervised Learning
       - Unsupervised learning is a machine learning approach where a computer explores and identifies patterns in data without predefined labels, revealing hidden structures or relationships.
       - Clustering
         - Principle Component Analysis
         - Hierarchical Clustering
         - Singular Value Decomposition
         - Independent Component Analysis
         - K- Means Clustering
       - Association
     - Reinforcement Learning
       - Reinforcement learning is a type of machine learning where a computer learns to make decisions by taking actions and receiving feedback in the form of rewards or penalties from its environment.
       - Model
         - 1 Hour JF Implementation
           - Image Based
           - Policy Based
           - Value Based
         - Q Learning
         - Markov Decision Process
4. Job Roles
   - Data Analytics
     - Sales Analyst
     - Operations Analyst
     - Customer Success Analyst
     - Market Research Analyst
     - Marketing Analyst
     - Business Analyst
     - Financial Analyst
   - Machine Learning
     - Machine Learning Engineer
     - Data Architect
     - Data Scientist
     - Data Mining Specialist
     - Cloud Architect
     - Cyber Security Analyst
   - Data Science
     - Analytics Manager
     - Business Analyst
     - Statistician
     - Machine Learning Engineer
     - Data Engineer
     - Data Scientist
     - Data Analyst
     - Data Architect
     - Database Administrator
5. Road Map to become Data Scientist
6. Complete Skill needed for Industry
   - 1. Data Preparation
     - Data Source
     - Data Cleaning
     - Data Combining
     - Data Transformation
   - 2. Number Crunching
     - Statistical Analysis
     - Functional Analysis
     - Ad-Hoc Analysis
     - Experimental Analysis
   - 3. Story Telling
     - Charts
     - Story
     - Formatting
     - Presentation
     - Visual Design skills
   - 4. Asking Question
     - Why do u need?
     - What should include?
     - Any exclusion ?
     - How to display?
   - 5. Technology
     - Excel
     - Syntax
     - Formula
     - Pivot Table
     - Charts
     - Dashboard
     - Power Point
     - Power Query
     - VBA Macros
     - Tableau
     - Power BI
7. Applications
   - 1. Object Recognition
   - 2. Face Recognition
   - 3. Autonomous Vehicle
   - 4. Disease Detection
   - 5. Emotion Recognition
   - 6. Agriculture
   - 7. Sentiment Analysis - NLP
   - 8. Language Translation - NLP
   - 9. Steganography & Cryptography

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