

1. Which of the following is not a self-management skill?
Answer: d. Indiscipline
2. What does GPS stand for?
Answer: a. Global Positioning System
3. Choose the correct example of oral communication
Answer: c. Face-to-face conversations
4. Improving your self-management skills:
Answer: a. Builds your confidence
5. Why do we send emails?
Answer: b. To share document and files
6. RAM stands for _____
Answer: c. Random access memory
7. Sustainable Development Goal 13 deals with _____
Answer: a. Climate change
8. Emails, Videos, and Audios are examples of _____
Answer: c. Unstructured Data
9. AI systems cannot _____ data
Answer: b. Understand
10. Unscramble the letters and find the name of the first humanoid robot with a citizenship
Answer: a) TERBHER OXEVE (The correct name is Sophia)
11. _____ means to understand the dependency and correlation between various word tokens across sentences.
Answer: d. Dependency parsing
12. _____ is the first step in order to do data visualization.
Answer: a. Data Cleaning
13. Breaking sentences into words in NLP is called.....
Answer: b. Tokenization of words
14. _____ helps us to summarize all the key points into one single outline so that in future, whenever there is need to look back at the basis of the problem, we can take a look at it and understand the key elements of it.
Answer: b. Problem Statement Template
15. What are the people facing a problem called?
Answer: a. Stakeholders
16. From where does the basic structure of a Decision Tree start?
Answer: a. Root
17. Regression works with:
Answer: b. Continuous Data
18. Which of the following steps comes first?
Answer: b. Problem Identification
19. Labelled examples are used in _____
Answer: a. Supervised learning
20. Who is the father of Artificial Intelligence?
Answer: b. John McCarthy
21. Study of computer-based algorithms designed to automatically improve the experience through acquired learning
Answer: d. Machine Learning

22. Mention some real-life applications of Data Science:

- **Healthcare:** Predicting disease outbreaks, diagnosing diseases, personalizing treatments, analyzing medical images.
- **Finance:** Fraud detection, stock market predictions, credit scoring, algorithmic trading.
- **Retail:** Customer segmentation, sales forecasting, recommendation engines (e.g., Amazon, Netflix).
- **Marketing:** Targeted advertising, sentiment analysis, customer churn prediction.
- **Transportation:** Route optimization, predictive maintenance for vehicles, traffic analysis.
- **Social Media:** Sentiment analysis, trend prediction, fake news detection.
- **Agriculture:** Crop prediction, soil analysis, pest detection.
- **Energy:** Smart grid optimization, energy consumption prediction, renewable energy forecasting.

23. Differentiate between Learning-based and Rule-based models:

- **Learning-based models:**
 - **Definition:** These models learn patterns from data using algorithms. They improve over time by being trained on data.
 - **Examples:** Machine Learning, Deep Learning.
 - **How they work:** These models learn from input-output pairs or features, and adapt based on feedback. They don't require explicit instructions for every decision.
 - **Advantages:** Can handle complex and dynamic patterns in data, generalizes well on unseen data.
- **Rule-based models:**
 - **Definition:** These models use a set of predefined rules or logic to make decisions.
 - **Examples:** Expert Systems, Decision Trees.
 - **How they work:** The system is programmed with a set of "if-then" rules, and decisions are made based on those rules. These models do not adapt unless the rules are manually updated.
 - **Advantages:** Easy to interpret, works well in structured and well-defined environments.

24. List down the various steps involved in the AI Project Cycle:

1. **Problem Identification:** Understand and define the problem.
2. **Data Collection:** Gather relevant data needed to train models.
3. **Data Preprocessing:** Clean and preprocess the data (remove noise, handle missing values, normalization, etc.).
4. **Feature Engineering:** Select and create relevant features for the model.
5. **Model Selection:** Choose appropriate algorithms or models based on the problem (e.g., classification, regression).
6. **Model Training:** Train the model using the prepared data.
7. **Model Evaluation:** Evaluate model performance using metrics like accuracy, precision, recall, etc.
8. **Model Tuning:** Optimize hyperparameters to improve model performance.

9. **Deployment:** Deploy the model into a production environment.
10. **Monitoring and Maintenance:** Continuously monitor the model's performance and retrain if necessary.

25. What do you mean by Supervised Learning? Discuss with an example:

- **Definition:** Supervised learning is a type of machine learning where the model is trained on a labeled dataset, meaning the input data is paired with the correct output. The goal is for the model to learn the mapping between inputs and outputs so it can predict outputs for new, unseen data.
- **Example:** A classic example of supervised learning is a spam email classifier. The input data consists of email features (such as word frequency, sender, etc.), and the output labels are either "spam" or "not spam." The algorithm is trained using these labeled examples, and once trained, it can predict whether a new email is spam.

26. Define Machine Learning and Deep Learning in brief:

- **Machine Learning (ML):** Machine learning is a subset of AI that enables machines to learn patterns from data and make predictions or decisions without being explicitly programmed. It includes methods like regression, classification, and clustering.
 - **Example:** A recommendation system like the one used by Netflix to suggest movies based on your past behavior.
- **Deep Learning (DL):** Deep learning is a subset of machine learning that uses neural networks with many layers (hence "deep") to model complex patterns in large datasets. Deep learning is particularly effective in tasks like image recognition, speech processing, and natural language understanding.
 - **Example:** Self-driving cars using convolutional neural networks to interpret camera images and make driving decisions.

27. Discuss domains of Artificial Intelligence:

- **Natural Language Processing (NLP):** Focuses on the interaction between computers and human languages (e.g., chatbots, speech recognition).
- **Computer Vision:** Deals with how computers can interpret and process visual data from the world (e.g., image classification, facial recognition).
- **Robotics:** Involves creating robots capable of performing tasks autonomously or with minimal human input (e.g., industrial robots, drones).
- **Expert Systems:** A system that mimics the decision-making abilities of a human expert (e.g., medical diagnosis).
- **Machine Learning:** Focuses on creating algorithms that allow computers to learn from and make predictions on data.
- **Reinforcement Learning:** A type of machine learning where an agent learns by interacting with its environment to maximize some notion of cumulative reward.

28. What could be the applications of Artificial Intelligence in real life?

- **Healthcare:** Personalized medicine, drug discovery, predictive diagnostics.
- **Finance:** Fraud detection, credit scoring, robo-advisors.
- **Transportation:** Autonomous vehicles, traffic management systems, route optimization.

- **Customer Service:** Chatbots, virtual assistants, and automated customer support.
- **Entertainment:** Content recommendation systems (e.g., Netflix, Spotify), video game AI.
- **Retail:** Inventory management, demand forecasting, customer behavior prediction.
- **Manufacturing:** Predictive maintenance, quality control, automated assembly lines.
- **Security:** Face recognition, surveillance systems, cybersecurity threat detection.

29. What are the key differences between classification and clustering techniques in modeling?

- **Classification:**
 - **Definition:** Classification is a supervised learning technique where the goal is to assign labels (categories) to input data.
 - **Output:** Discrete class labels (e.g., spam or not spam, cancerous or non-cancerous).
 - **Example:** Classifying emails as spam or not spam.
- **Clustering:**
 - **Definition:** Clustering is an unsupervised learning technique where the goal is to group similar data points into clusters based on their features.
 - **Output:** Groups of data points, but without predefined labels.
 - **Example:** Customer segmentation, where customers are grouped based on their purchasing behavior.

30. The 4Ws Problem Canvas is a structured framework used during problem scoping to help clearly define and understand a problem before starting the solution development. The 4Ws represent **Who, What, Why, and Where**, and they guide teams in gathering and organizing relevant information to ensure a thorough understanding of the problem. Let's look at each component:

1. **Who:**
 - **Description:** This refers to the stakeholders involved in the problem. These are the people or groups who are directly or indirectly affected by the problem or will be impacted by the solution.
 - **Questions to ask:** Who are the stakeholders? Who is experiencing the problem? Who needs the solution? Who is responsible for solving the problem?
2. **What:**
 - **Description:** This focuses on defining the actual problem. It describes what the issue or challenge is, outlining the current situation and the desired change.
 - **Questions to ask:** What is the problem? What needs to change? What is the goal? What are the existing constraints?
3. **Why:**
 - **Description:** This addresses the reasons behind the problem and why it needs to be solved. Understanding the underlying causes helps in framing the problem correctly and determining the importance of finding a solution.
 - **Questions to ask:** Why is this problem important? Why does it need to be solved now? Why hasn't the problem been solved yet?
4. **Where:**

- **Description:** This deals with the context and environment where the problem exists. It defines the scope of the problem, whether it is local, global, within a specific department, or at a societal level.
- **Questions to ask:** Where is the problem occurring? Where will the solution be implemented? Where are the resources needed?

31.

1. True Positive (TP):

- **Prediction:** The project will be successful.
- **Reality:** The project is successful.
- **Explanation:** The project meets the objectives, is delivered on time, and stays within budget. The prediction about the success of the project was correct.
- **Example:** A software development project that was predicted to meet all requirements and was successfully completed within the allocated time and budget.

2. True Negative (TN):

- **Prediction:** The project will fail.
- **Reality:** The project fails.
- **Explanation:** The project is unable to meet the expected objectives, exceeds budget, or doesn't achieve the desired results. The prediction about failure was correct.
- **Example:** A construction project that was predicted to face delays and budget overruns, and indeed fails to meet the deadlines and budget.

3. False Positive (FP):

- **Prediction:** The project will be successful.
- **Reality:** The project fails.
- **Explanation:** The project is predicted to be successful, but in reality, it fails to meet its objectives, goes over budget, or falls short in quality.
- **Example:** A marketing campaign predicted to result in high sales, but instead, it fails to engage customers and does not lead to the expected sales boost.

4. False Negative (FN):

- **Prediction:** The project will fail.
- **Reality:** The project is successful.
- **Explanation:** The project is predicted to fail, but it actually achieves its goals and is considered a success.
- **Example:** A new product launch that was considered risky and predicted to fail, but actually becomes successful due to high customer demand and positive feedback.

32. Discuss the benefits of using generative AI

Generative AI offers several key benefits:

1. **Creativity and Innovation:** It helps generate new, unique content like images, text, and designs, fostering creativity across industries.
2. **Time and Cost Efficiency:** Automates repetitive tasks, speeding up processes and reducing manual effort, leading to cost savings.
3. **Personalization:** It tailors content to individual preferences, enhancing customer experiences in e-commerce and marketing.
4. **Automation:** Supports automation by generating content or code, improving productivity and efficiency.
5. **Content at Scale:** Produces large amounts of content quickly, beneficial for industries needing high-volume output.
6. **Data Augmentation:** Creates synthetic data for training AI models, especially useful in fields with limited data.
7. **Problem-Solving and Simulation:** Generates multiple solutions or prototypes, helping optimize complex decisions.
8. **Reducing Bias:** Can create neutral, fact-based content, minimizing human biases.
9. **Language Translation:** Assists in translating and localizing content for global reach.
10. **Healthcare Advancements:** Aids in drug discovery, diagnostics, and personalized treatment plans.
11. **Human-AI Collaboration:** Enhances human creativity and productivity, working as a tool for better outcomes.