

TD Series 1: Basic Concepts of AI

Exercise 1 :

1. Using your own words, explain what artificial intelligence is.
2. Give 3 concrete examples of AI applications in everyday life.
3. Explain what an AI agent is.
4. What is your vision of the future of artificial intelligence?

Exercise 2 :

1. How has the evolution of computing power influenced the development of modern AI?
2. Explain the difference between symbolic AI and statistical AI. Give an example of an application for each approach.
3. Name three areas where AI has a significant impact today.
4. Give three concrete examples of areas where AI is used today, and briefly explain how it is applied there.

Exercise 3:

A bank that offers banking services to individuals wishes to integrate artificial intelligence into its operations to improve its services, optimize its processes, and strengthen its competitiveness. The bank has identified several areas where AI could be particularly useful. Here are the main characteristics and typical services of a retail bank: You must design the structure and composition of an AI team that will be responsible for implementing these different applications for the bank.

1. Identification of roles and skills:

- 1.1. What are the key roles and skills needed to build an effective AI team for the Bank? (Think of

technical skills, but also project management, communication skills, etc.)

- 1.2. Describe in detail the responsibilities of each role and the specific skills required (e.g., for a financial analyst: knowledge of financial markets, understanding of banking products, etc.).

2. Team structure:

- 2.1. Propose an appropriate team structure for this project, justifying your choice (e.g., centralized, decentralized, hybrid). Consider the size of the Bank, its available resources, and the project's objectives.

- 2.2. Represent this structure as an organization chart.

3. Team management:

- 3.1. How to ensure communication and collaboration within the team? (Propose tools and working methods).

- 3.2. How to manage potential conflicts within the team?

- 3.3. How to motivate and retain team members?

4. Performance evaluation:

- 4.1. How to evaluate the performance of the AI team? (Propose relevant performance indicators).

- 4.2. How to monitor the progress of projects and ensure their compliance with the Bank's objectives?

5. Ethical questions:

- 5.1. What are the ethical questions to consider when building and managing an AI team for the Bank? (For example, confidentiality of customer data, algorithmic biases, discrimination, etc.)

Exercise 4 :

1. Explain the difference between supervised learning and unsupervised learning.
2. Give two examples of supervised learning algorithms and two examples of unsupervised learning algorithms.
3. For each example, describe the type of problem it solves.
4. Imagine you have to build a system to predict whether a bank customer will repay their loan or

not. What type of learning would you use? Justify your choice.

5. A small bakery owner wants to know how many loaves of bread he will sell each day. He notices that sales mainly depend on the day of the week. For example, he sells more bread on weekends (Saturday and Sunday) and less in the middle of the week (Tuesday or Wednesday). The baker wants to use data from previous weeks (day of the week and number of loaves sold) to predict how many loaves he will sell tomorrow. This will help him better manage his production and avoid wasting unsold bread.

5.1. Analyze the problem and say whether it is a supervised or unsupervised learning problem.

5.2. Propose an algorithm to solve this problem? Justify your answer?