Quick Refresher for ML
Group Exercise: Categorizing Real-World Problems

Time Required: 15 minutes

Learning Objectives

By the end of this exercise, you will be able to:

- Analyze real-world business problems and classify them as supervised, unsupervised, or reinforcement learning problems.
- Justify the choice of machine learning approach based on the characteristics of the problem.

Instructions

1. Form groups of 3-4 participants.
2. Each group will review the set of real-world business problems provided below.

3. Discuss each problem within your group and decide whether it is best suited for **supervised learning**, **unsupervised learning**, or **reinforcement learning**.

4. For each problem, justify your choice by explaining:
   - What the goal of the ML system would be.
   - What kind of data would be required.
   - Why the chosen ML type is appropriate.

5. At the end of the activity, each group will be asked to share their classifications and reasoning with the class.

Real-World Business Problems

1. A telecommunications company wants to predict whether a customer will cancel their subscription next month.

2. An e-commerce platform wants to suggest products to customers based on their browsing and purchase history.

3. An airline wants to adjust ticket prices in real time based on seat availability, demand, and customer booking patterns.

4. A marketing team wants to group customers into segments based on their demographics and purchasing behavior.

5. A bank wants to detect unusual transactions that may indicate fraud.

6. A logistics company wants its delivery drones to navigate through city streets and optimize delivery routes.

7. A retail store wants to predict next month's sales based on historical sales data and seasonal trends.

Discussion Prompts

- What is the output we need from the model? (Prediction, grouping, or action optimization?)
- Do we have labeled data, or are we exploring patterns without known outcomes?
- Are decisions made once, or does the system need to continuously learn and adjust?

Be prepared to share your group's classifications and justifications with the class.