***Sales and Returns Analysis 2009-2011***

*Retail Online II Dataset-Kaggle*

📊 *About the Project*

This project focuses on analyzing the **Online Retail II dataset (2009–2011)** taken from *Kaggle.com* to uncover customer behavior, sales performance, and return patterns. The workflow was carried out in two stages:

1. **Exploratory Data Analysis (Jupyter Notebook)**
   * Imported and cleaned raw transactional data, handling missing values and duplicates.
   * Explored product-, customer-, and country-level sales trends.
   * Calculated key metrics such as total revenue, revenue per customer, and order distribution.
   * Identified best-selling products and highlighted patterns in purchasing behavior across different regions.
2. **Interactive Dashboard (IBM Cognos Analystics)**
   * Designed dashboards to make insights more accessible and decision-friendly.
   * Key highlights include:
     + **Total Sales:** $19.2M across ~6,000 unique customers with an average order value of ~$359.
     + **Top Products:** Seasonal and decorative items (e.g., assorted bird ornaments, retrospot bags, bunting) dominate sales.
     + **Geographic Insights:** The UK leads sales by a large margin, followed by EIRE and several European countries.
     + **Monthly Trends:** Clear peaks during festive months, indicating strong seasonal effects.
     + **Returns Analysis:** Over 1M units returned (worth $1.52M), with a return rate of 7.34%. Certain fragile or decorative items had higher return rates.

### Key Insights

* The business has **high seasonality**, with sales spiking around the holiday season.
* A small subset of products contributes disproportionately to total revenue.
* While the UK dominates, there is **international demand** worth exploring further.
* Returns, though not extreme, represent a **non-trivial loss** (~7% of sales) and require attention on quality control and logistics.

### What You Can See in the Dashboards

* **Sales Performance Overview:** Total sales, unique customers, and order values.
* **Product-Level Insights:** Top-selling items and return-prone products.
* **Time Trends:** Monthly and yearly sales patterns.
* **Geographic Distribution:** Country-level contribution to total sales.
* **Returns Breakdown:** Return volumes, values, and reasons.

This project demonstrates how raw transactional data can be transformed into **business-ready insights** and **decision-support dashboards** that highlight growth opportunities and operational risks.