1. **Derived Column in Azure Data Factory (ADF)**

A **Derived Column** is a transformation in **Mapping Data Flows** in **Azure Data Factory (ADF)** and **Azure Synapse Analytics**. It allows you to create **new columns** or **modify existing columns** using expressions.

**Purpose of Derived Column**

1. **Data Transformation:**
   * Modify or create new columns using expressions, functions, and operators.
   * Example: Convert a column to uppercase (upper(CustomerName)).
2. **Data Enrichment:**
   * Add computed values based on existing data.
   * Example: Calculate **TotalPrice** as Quantity \* UnitPrice.
3. **Data Cleaning & Formatting:**
   * Apply string manipulation, date conversions, and type casting.
   * Example: Convert a string date "2024-02-26" to a datetime format.
4. **Conditional Logic Implementation:**
   * Use **IF conditions** to create new values.
   * Example: Assign Category = "High" if SalesAmount > 1000, else "Low"

--------------------------------------------------------------------------------------------------------------------------

1. **Alter Row Transformation in Azure (ADF & Synapse)**

The **Alter Row** transformation in **Mapping Data Flows** is used to **conditionally insert, update, delete, or upsert** rows in a database or destination.

**Key Uses:**

1. **Insert Rows** → Add new records when a condition is met.
2. **Update Rows** → Modify existing data based on conditions.
3. **Delete Rows** → Remove specific records from the destination.
4. **Upsert Rows** → Insert if the record doesn’t exist; update if it does.
5. **Reject Rows** → Skip rows that don’t meet conditions.
6. **Lookup Transformation in Data Flows (Azure Data Factory & Synapse Analytics)**

The **Lookup** transformation in **Mapping Data Flows** is used to **retrieve related data from another dataset** based on a matching condition. It works like a SQL **JOIN** but only returns **one matched row per input row**.

**Key Uses of Lookup Transformation:**

**Enrich Data** → Add extra details from another dataset (e.g., adding customer details to sales data).

**Reference Data** → Fetch predefined values from a lookup table (e.g., country codes, tax rates).

**Filter or Validate Data** → Check if a record exists in another dataset before processing.