# Data Model Summary

## Schema Type

The data model is designed using a Star Schema approach. The central fact table, 'Sales', is connected directly to four dimension tables: Customers, Products, Region, and Date. Additionally, a secondary fact table, 'Returns', is integrated for return transactions, forming a hybrid structure often referred to as a Fact Constellation (Galaxy Schema). No further normalization of dimensions was performed, so it is not a Snowflake schema.

## Relationship Rationale and Filter Flow

Relationships were created based on primary and foreign keys:  
- Sales → Customers (CustomerID)  
- Sales → Products (ProductID)  
- Sales → Region (RegionID)  
- Sales → Date (DateKey)  
- Returns → Sales (SalesID)  
- Returns → Date (ReturnDateKey, inactive relationship)  
  
All active relationships use a One-to-Many cardinality from dimension to fact tables with single-direction filters. This ensures clear filter propagation without ambiguity and maintains model performance. An inactive relationship between Returns and Date was implemented.

## Issues Encountered and Resolutions

1. Ambiguity with multiple relationships to the Date table:  
 - Resolved by setting the ReturnDateKey relationship as inactive to prevent filter ambiguity.  
  
2. Potential bidirectional filter loops:  
 - Resolved by maintaining single-direction filter flow for all relationships.  
  
3. Missing data type consistency:  
 - Corrected by assigning proper data types (e.g., Date, Whole Number, Currency) during Power Query transformation.