

# **TOPICS**

**Fundamentals**

**Structured and Object-Oriented Analysis**

**Formal and Automated Techniques**

# **Data Modeling**

## **Data Objects, Attributes and Relationships**

OOA concepts arose out of data-intensive analysis techniques (called *data modeling* or *information modeling*) that have been in existence for years (especially in database systems).

Recent uses of data modeling are seen in defining data formats for interchanging data between CAD systems, computers, and manufacturing organizations.

Some terms:

schema - data model used in databases

protocol - data model used in digital communications

framework - data models used to interchange data between CAD systems and manufacturing organizations

# **Data Objects, Attributes, and Relationships**

**Objects**

have

**Attributes**

**Naming attributes**

**Descriptive attributes**

**Referential attributes**

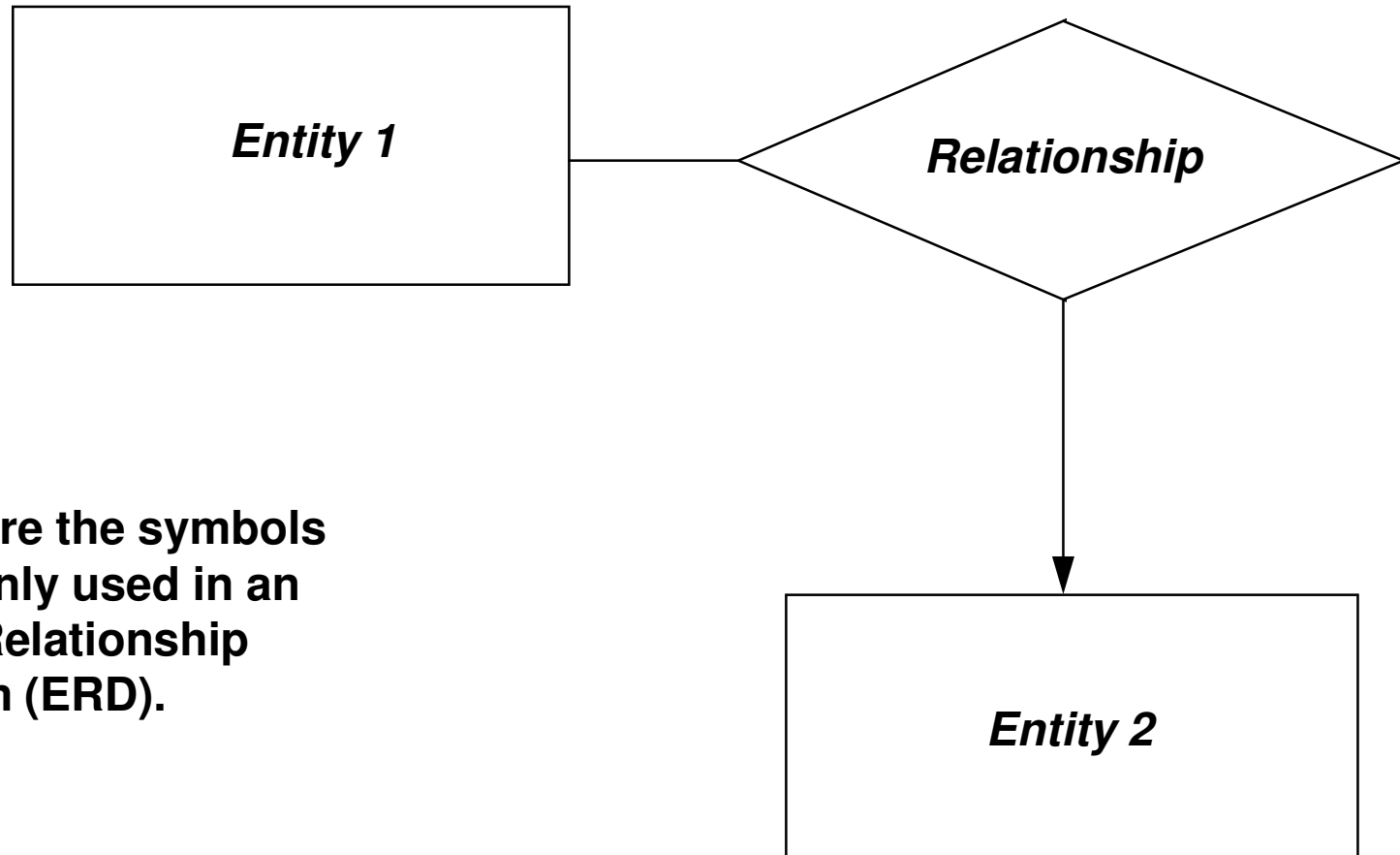
**Objects**

own

**Objects**

# **Data Modeling**

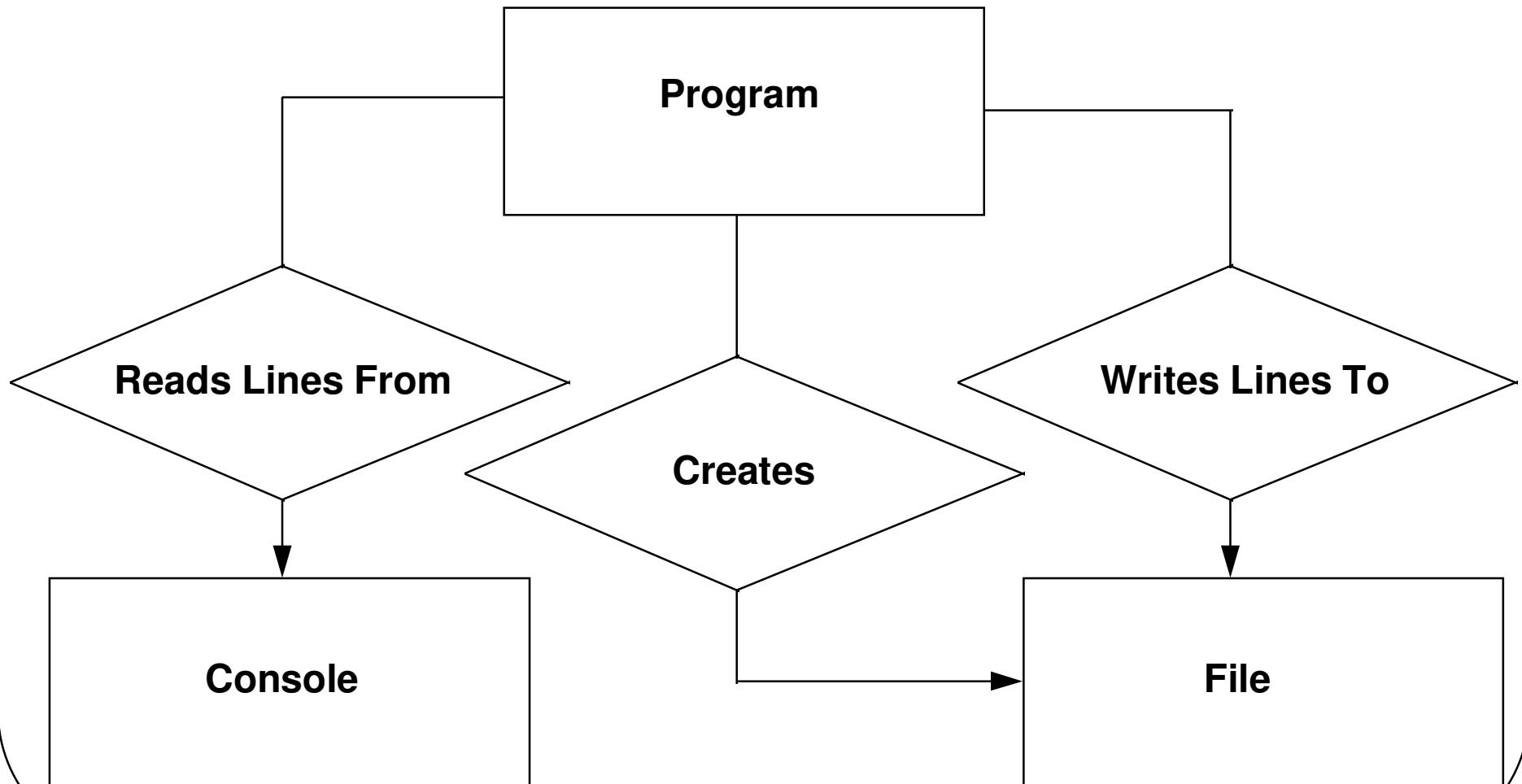
## **Entity-Relationship Diagrams**



**These are the symbols  
commonly used in an  
Entity-Relationship  
Diagram (ERD).**

# **Data Modeling, Continued**

## **Entity-Relationship Diagrams - Example**



## **Automated Tools**

- **are often graphically-oriented**
- **may provide consistency checking**
- **support the development of the data dictionary**
- **usually support the development of DoD-STD-2167A documentation**