# Choosing a Notation Type

by Sophia

:= WHAT'S COVERED

In this lesson, you will explore the commonalities and differences between crow's foot and Chen notation and learn about the advantages of each. Specifically, this lesson will cover:
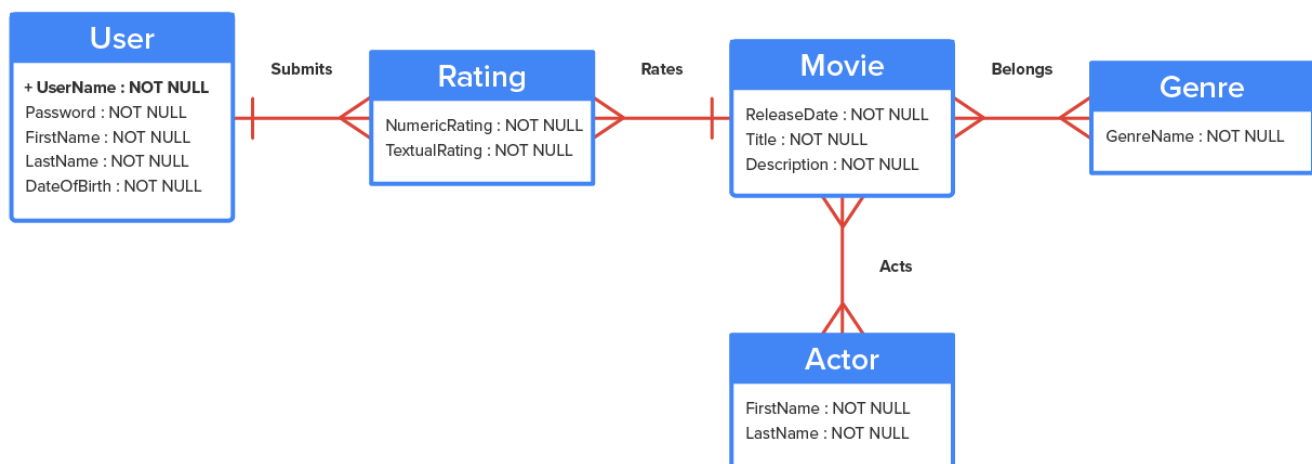
1. Similarities and Differences Between Crow's Foot and Chen Notation
2. Advantages of Crow's Foot Notation
3. Advantages of Chen Notation

1. Similarities and Differences Between Crow's Foot and Chen Notation

Database designers commonly use Chen and crow's foot notations to represent entity-relationship diagrams (ERDs). Though they have some visual differences, they share several fundamental concepts regarding how they model entities and relationships. The following figure shows the ERD for the movie ratings database that we have been working on in earlier lessons in Chen notation.
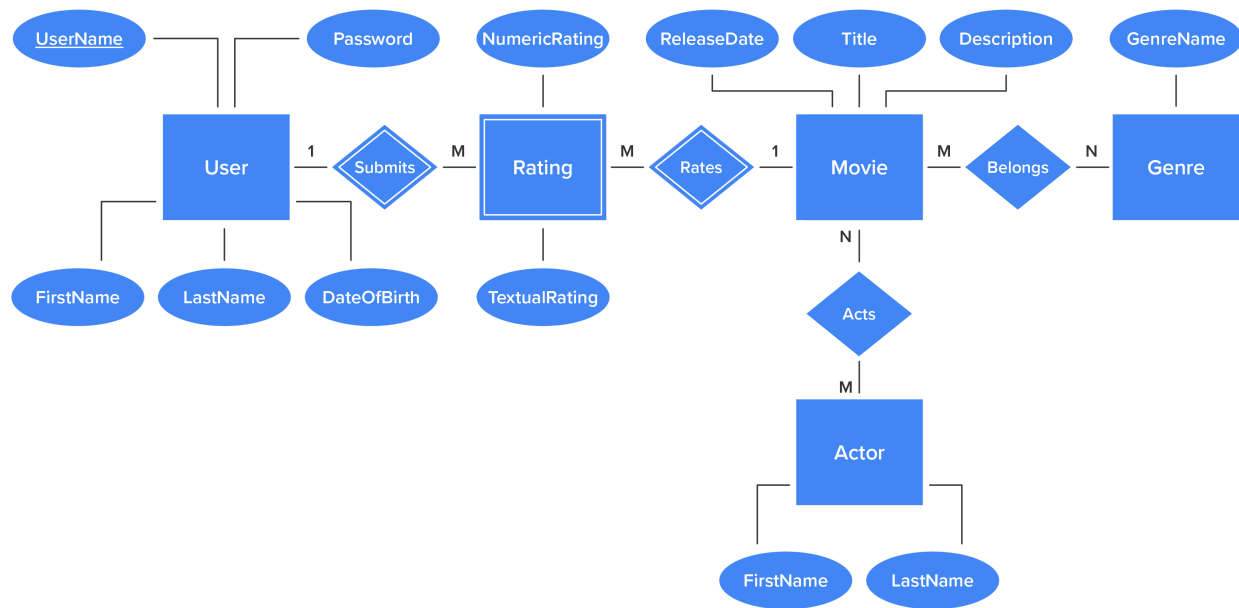
For comparison, the following figure shows the same diagram in crow's foot notation.

Here are some key similarities and differences to observe in the figures above:

- Both notations represent entities using rectangles. Chen notation uses ovals to represent attributes, whereas crow's foot notation lists attributes inside the entity's rectangle.
- Both notations use lines to represent relationships between entities. Chen notation uses the characters 1, N, and M to describe cardinality, whereas crow's foot notation uses short lines at the ends of the connectors.
- Both notations use verbs to explain the relationship between entities. Chen notation places these words in diamonds, whereas crow's foot notation places them on or adjacent to the relationship line.
- Both notations indicate primary key attributes using underline or bold.

Although Chen and crow's foot notations have visible differences, core concepts and modeling principles remain the same. In the database community, both notations are widely used and accepted, and choosing one

over the other often comes down to personal preference, organizational convention, or the requirements of the use case, as explained next.

2. Advantages of Crow's Foot Notation

Crow's foot notation is often considered simpler, more visually intuitive, and more readable than Chen notation. It uses a simpler set of symbols, making it easier for users to understand and learn. For this reason, it is a popular choice with educators who are teaching database design concepts in classrooms.

Crow's foot notation is also ideal for small databases with simple relationships, and for sharing with non-technical stakeholders such as managers, clients, or business analysts because it represents relationships in an easy-to-understand manner.

Another advantage is its consistent use of symbols. The symbols used to represent entities, relationships, and cardinality are more standardized, leading to less ambiguity.

Its popularity is also an advantage. Crow's foot notation has gained widespread acceptance and is commonly used both in database design courses and in industry. This ubiquity can be advantageous for collaboration within the database design community.

Its compact diagram layout can also be beneficial. Because crow's foot notation includes attributes within the entity rectangle, it can represent a schema more compactly than Chen notation can, with its separate ovals for each attribute. This not only results in diagrams that are easier to print and share but also in quicker and more efficient diagram creation.

3. Advantages of Chen Notation

Chen notation is a good choice when it's important to capture the entities' attributes and relationships precisely and hierarchically. It facilitates a more formal and comprehensive model, making it suitable for creating formal documentation for large-scale, complex databases. Its precision makes it easier for future stakeholders to fully understand the database structure.

Chen notation provides a richer set of symbols for representing different concepts in a database design. (You have not learned about all these symbols yet in this course.)

It also makes a clearer distinction between entity types and relationship types. For example, it represents weak and strong relationships and entities differently, as you have seen in earlier lessons. It also distinguishes visually between different types of keys (primary vs. foreign, for example).

Chen notation follows a hierarchical structure in representing entities and relationships, making it potentially more organized and easier to follow when tracing the logic of a large, complex database design.

Ultimately, the choice of notation depends on the project requirements, the intended audience, and the level of detail in the ERD. Some designers may prefer Chen notation for its explicit representation of certain concepts, while others may find crow's foot notation simpler and more intuitive.

📋 SUMMARY

In this lesson, you compared Chen notation and crow's foot notation, both visually and in terms of their features and advantages.

You reviewed the basics of each, looking at their **similarities and differences**. The similarities include that they both represent entities using rectangles, they both use lines to represent relationships, and they both use verbs to explain the relationships between entities. They are different in the ways that they represent attributes (ovals vs. text in the entity rectangle), describe cardinality (characters vs. symbols), and place the words to describe the relationships (in diamonds vs. alongside the relationship lines).

Next, you learned about some **advantages** of each notation style. You learned that crow's foot notation is simpler, more compact, and easier for non-technical stakeholders to understand, and is a popular choice for smaller databases and for academic study. Chen notation, in contrast, is a good choice when precision is needed and when modeling complex databases. It has a richer set of symbols and makes a clearer distinction between entity and relationship types such as strong and weak.

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