**Portfolio Milestone Option 1**

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First-order logic (FOL) is a formal language that can be used to represent complex relationships and knowledge about objects, properties, and events (Bárány et al., 2015). In a TV show recommendation system, FOL can be used to encode knowledge about TV shows, users, and their preferences, then perform inference and deduction to generate recommendations. FOL can represent the genres and properties of a TV show, such as “Action” or “Comedy” and the cast and ratings. With this knowledge, the system can then perform logical deductions and inferences to determine which TV shows are likely to be of interest to users based on their preferences. For example, the system could represent the rule; if a user likes action movies and the TV show has a high rating, then the user is likely to enjoy the show. With this rule and the preferences of each user, the system could then make recommendations. Additionally, FOL can be used to represent the relationships between TV shows, such as TV; shows with similar genres and rating tend to be enjoyed by this user. The use of FOL in a TV show recommendation system can provide a powerful and flexible means of representing and reasoning about the knowledge needed to make personalized recommendations.

**Reference**

Bárány, V., Cate, B. T., & Segoufin, L. (2015). Guarded negation. *Journal of the ACM*, *62*(3), 1–26. https://doi.org/10.1145/2701414