CS6852 : Theory and Application of Ontologies

Assignment 2

Ontology Design

Domain: Movies

Group Members

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Problem Statement:

Group task:

Each team is required to create an ontology or semantic model of a domain of their choice (Consider the same domain from Assignment 1 so that data can be reused). We need to develop the semantic model using the description logic SROIQ.

Submission guidelines:

We are required to submit a pdf document containing:

1) List of important pieces of knowledge from the domain that are captured in the ontology.

2) The DL ontology (TBox).

3) A write-up about the design choices made and the details of the design - the explanations for classes, properties, DL axioms, motivating situations/examples - of the ontology.

Please keep the overall goal of the full set of assignments in mind while designing the ontology. You can plan to have members of the primitive symbols (concepts and relationships) available/ extractable from XML data you had generated in Assignment 1.

Motivation:

The idea behind choosing this domain is Movie, which comes under the category of Entertainment which provides enjoyment, relaxation, happiness and wide diversion from day to day life. Entertainment which can take many forms such as movies, TV shows, Music, games and Sports. Most people seek out entertainment through movies to escape from the stress of work and daily responsibilities. Movies can also serve as a form of artistic expression where Directors and Producers use this as a medium to express their ideas, thoughts and statements about the world. Movies can also bring people together with friends and family to watch a film,share their reactions and personal opinions about a particular incident. And at the

same time we can use movies as the best platform and powerful tool for education, social awareness and society, with film documentaries and historical dramas providing some valuable information into the real world events and issues. And also through movies people can learn about different cultures and social issues helps to understand the real world which is surrounded by them.

Domain: Movies

The Movies Domain contains title, year, director, actor, genre, plot, country, language, runtime, rating, writers and awards. In this assignment, we are trying to design an ontological knowledge base for the various contents of the movies. This topic is very diverse and challenging involving various design metrics to be considered while designing the TBox.

Design choice and details:

Below are the most important concept names and role names that we have identified in the movie domain:

Concept Names and Their Descriptions:

1. **Movie :** A movie is a form of visual storytelling that uses moving images and sound to convey a narrative or depict characters and events.

2. **Actor :** An actor is a male professional performer who portrays a character in a play, film, television show, or other form of entertainment.

3. **Actress :** An actress is a female professional performer who portrays a character in a play, film, television show, or other form of entertainment.

4. **Producer :** A producer is a person or company that is responsible for overseeing the creation and production of a movie.

5. **Director :** A director is a creative professional who oversees and guides the production of a film or television show. They are responsible for bringing the script to life and translating it into a visual form that can be experienced by the audience.

6. **MovieWriter :** A professional who writes the script for a movie.

7. **HorrorMovie :** Movies having the genre "Horror".

8. **ActionMovie :** Movies having the genre "Action".

9. **ThrillerMovie :** Movies having the genre "Thriller".

10. **LeadActor :** Actor who plays the primary role in a movie.

11. **LeadActress :** Actress who plays the primary role in a movie.

12. **SupportingActor :** Actor other than the lead actor in a movie.

13. **Supporting Actress :** Actress other than the lead actress in a movie.

14. **Role :** A role in the movie domain refers to the specific character or the part that an actor plays in a movie.

15. **LeadRole :** A lead role in a movie refers to the primary character or protagonist that is central to the story and has the most screen time.

16. **BollywoodMovie :** Hindi movies originated in country india.

17. **HollywoodMovie :** English movies originated in the USA.

18. **KoreanMovie :** Korean Movies originated in Korea.

19. **CreativeMovie :** Creative movies refer to films that explore new and innovative approaches to storytelling, cinematography, editing, and other elements of filmmaking.

20. **CreativeDirector :** A creative director in a movie is a key member of the film's production team responsible for overseeing the creative aspects of the movie's development.

21. **VFXDesigner :** A VFX (Visual Effects) designer in a movie is a skilled professional responsible for creating and integrating visual effects into a movie.

Roles and Their Description:

1. **hasProduced**
   Example: Steven Spielberg (Actor) is a famed *Film Producer* who *hasProduced* many award winning works such as Schindler's List (Movie).

2. **hasActor**
   Example: Newton (movie) *has actor* Rajkumar Rao (Actor) who has acted in many other hindi movies.

3. **hasDirected**
   Example: Michael Bay (Actor) who has acted in some movies, is also an iconic film director and *hasDirected* movies which have explosive action sequences, complex visual effects, and compelling characters (plot).

4. **hasGenre**
   Example: James Cameron (Director) movies *has Genre* Science fiction.

5. **hasProducer**
   Example: Marvel movies *has Producer* Kevin Feige (Producer).

6. **hasWritten**

Example: Javid Akhtar (Writer) *has Written* sholay (movie).

7. **hasActed**

Example: Quentin Tarantino (Director) *has acted in* many of his own movies.

8. **hasEdited**

Example: Stephen Mirrione *has edited* the Revenant (Movie), who earned an Academy Award for his work. He was in charge of editing the film and bringing together the different parts of the story in a cohesive and powerful way.

9. **hasCinematographed**

Example: Roger Deakins *has Cinematographed* the Blade Runner (movie).

10. **playedCameo**

Example: Salman khan (Actor) has *played a cameo* in pathan (movie).

11. **hasDirector**

Example: Ajay Devgan (Actor) has turned director for his next movie.

12. **hasPlayedSupportingActor**

Example: kadar khan (Actor) had *played supporting actor* in david dhawan (director) films.

13. **hasProductionDesigned**

Example: Lee Smith *has production designed the* Batman movie franchise.

14. **hasVFXDesigned**

Example: In Avengers: Endgame (Movie) David was the *VFX Designer* responsible for all of the visual effects work on the film, from the design and creation of the special effects to the final rendering of the images.

15. ActedIn
Example: ShahRukh khan (Actor) *has acted in* pathan (Movie)

16. hasPlayedVillain
Example: The Joker (role), *has played villain* from the Batman movie series, had a plan to take over Gotham City. He used his cunning and intelligence to create chaos and confusion, causing mayhem wherever he went.

17. hasNarrated
Example: John Smith (Director) *has narrated* all the movies he directed.

18. playedLoveInterest
Example: Kate Winslet (Actress) had *played the love Interest* of Leonardo Dicaprio in Titanic (Movie).

19. hasHeight
Example: Will Smith (Actor) *has height* more than 6 feet.

20. playedBy
Example: The Iron man (role) was *played by* Robert Downey Jr. (Actor) In the marvel cinematic universe movies.

21. pairedWith
Example: ShahRukh (Actor) was *paired with* kajol (Actress) in many movies together.

22. hasGenre
Example: Quentin Tarantino (Director) movies *hasGenre* science fiction.

23. hasLanuage
Example: Bollywood movies *has Hindi Language*.

TBox:

1. Movie $\sqsubseteq$ ∃ hasActor.Person
2. Movie $\sqsubseteq$ ∃ hasDirector.Person
3. Movie $\sqsubseteq$ ∃ hasWriter.Person
4. Movie $\sqsubseteq$ ∃ hasProducer.Person
5. Movie $\sqsubseteq$ ∃ hasGenre.Genre
6. Actor ≡ Man ⊓ ∃ ActedIn.Movie
7. Actress ≡ Woman ⊓ ∃ ActedIn.Movie
8. Producer ≡ Man ⊕ Woman ⊓ ∃ hasProduced.Movie
9. Director ≡ (Man ⊕ Woman) ⊓ ∃ hasDirected.Movie
10. HorrorMovie ≡ Movie ⊓ ∃ hasGenre.Horror
11. ActionMovie ≡ Movie ⊓ ∃ hasGenre.Action
12. ThrillerMovie ≡ Movie ⊓ ∃ hasGenre.Thriller
13. LeadActor $\subseteq$ Actor
14. LeadActress $\subseteq$ Actress
15. SupportingActor $\subseteq$ Actor ⊓ ¬LeadActor
16. SupportingActress $\subseteq$ Actress ⊓ ¬LeadActress
17. LeadRole ≡ Role ⊓ ∃ playedBy.LeadActor
18. BollywoodMovie ≡ Movie ⊓ ∃ hasLanguage.Hindi ⊓
    ∃ originatedFrom.India
19. HollywoodMovie ≡ Movie ⊓ ∃ hasLanguage.English ⊓
    ∃ originatedFrom.USA
20. KoreanMovie ≡ Movie ⊓ ∃ hasLanguage.Korean ⊓
    ∃ originatedFrom.Korea
21. MovieWriter ≡ (Man ⊕ Woman) ⊓ ∃ hasWritten.Movie
22. VFXDesigner ≡ (Man ⊕ Woman) ⊓ ∃ hasVFXDesigned.Movie
23. CreativeMovie $\subseteq$ Movie
24. CreativeDirector ≡ Director ⊓ ∃ hasDirected.CreativeMovie
25. Narrator ≡ (Man ⊕ Woman) ⊓ ∃ hasNarrated.Movie

26. ScifiMovie ≡ Movie ⊓ ∃ hasGenre.Scifi
27. Movie ⊑ ∃ hasVFXDesigner.Person
28. Villain ≡ Actor ⊓ ∃ hasplayedVillain.Movie
29. Cinematographer ≡ (Man ⊕ Woman) ⊓
    hasCinematographed.Movie
30. Editor ≡ (Man ⊕ Woman) ⊓ hasEdited.Movie
31. SupportingActor ≡ Actor ⊓ ∃ hasplayedSupportingActor.Movie