

Developing an Ontology-Based Music Recommendation System

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Introduction To The Project:

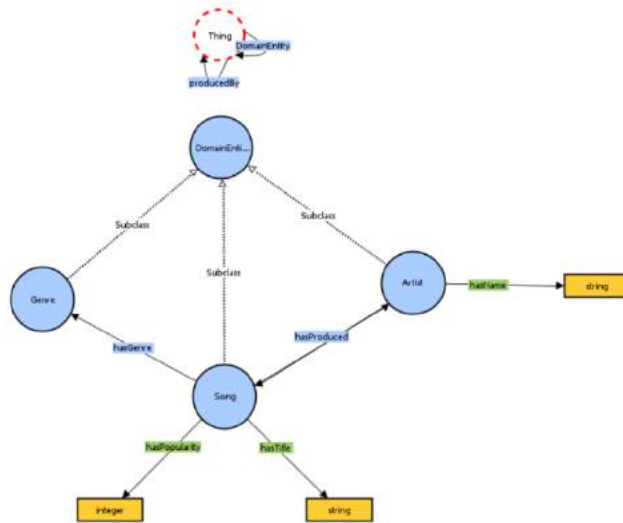
The development of music recommendation systems using ontologies and web semantics has gained significant attention in recent years. By analyzing user preferences, behavior, and past listening habits, these systems suggest songs, albums, or artists to users that align with their individual preferences. In this project, we have designed a music recommendation system that recommends popular songs based on a chosen genre or artist using their popularity score. Our system is able to identify patterns and provide personalized recommendations that enhance the listening experience for music lovers.

Problem Statement & Objective:

With the ever-increasing music options available, a personalized music recommendation system is necessary. We developed an ontology-based music recommender using Protege, Celfie plug-in which we used in protege, and Apache Jena Fuseki, and implementing it with Flask and web technologies such as HTML, CSS, and JavaScript. This system will capture the complex relationships between different music genres, styles, and moods, and provide users with personalized and diverse music recommendations based on their individual preferences.

Methodology:

1.Design an ontology of music: The first step is to create an ontology that defines the classes of music, including songs, artists, and genres, as well as their Object properties and Data properties. This ontology was created using Protege.



2. **Download a database of music:** The next step is to obtain a database of music, which can be in the form of an Excel file or any other suitable format.

3. **Map the database to the ontology:** The third step involves mapping the database to the ontology that was created in step one. This can be done using a Celfie plug-in, which helps in mapping the data to the ontology.

Cellfie

Target Ontology: untitled-ontology-33 (<http://www.semanticweb.org/dell/ontologies/2023/3/untitled-ontology-33>)

Workbook (C:\Users\JYOTIRMAY\Downloads\top50MusicFrom2010-2019 (1).xls)

Worksheet

	A	B	C	D	E
1	title	artist	the genre of the track	year	Beats Per Minute - The tempo of
2	Hey, Soul Sister	Train	neo mellow	2010	97
3	Love The Way You Lie	Eminem	detroit hip hop	2010	87
4	TIK ToK	Kesha	dance pop	2010	120
5	Bad Romance	Lady Gaga	dance pop	2010	119
6	Just the Way You Are	Bruno Mars	pop	2010	109
7	Baby	Justin Bieber	canadian pop	2010	65
8	Dynamite	Taio Cruz	dance pop	2010	120
9	Secrets	OneRepublic	dance pop	2010	148

Transformation Rules (C:\Users\JYOTIRMAY\Downloads\cp.json)

Add Edit Delete Load Rules Save Rules Save As...

✓	Sheet Name	Start Column	End Column	Start Row	End Row	Rule	Comment
✓	Worksheet	A	N	2	604	Individual: @B* Types: Artist Facts: hasName @B*(xsd:string)	
✓	Worksheet	A	N	2	604	Individual: @A* Types: Song Facts: hasPopularity @N*(xsd:integer) Facts: producedBy @B* Facts: hasGenre @C* Facts: hasTitle @A*(xsd:string)	
✓	Worksheet	A	N	2	604	Individual: @C* Types: Genre	

4. **Design an interface:** The next step is to design an interface for the recommendation system. This can be done using a combination of technologies such as Flask, Java, Python, HTML, CSS.

5. Integrate SPARQL query: First, we wrote a Sparql query using Apache Jena Fuseki to test the results, and finally, we integrated this SPARQL query into the recommendation system to recommend music based on the user's selection of artist and genre.

Links:

You-tube Link: [Music Recommendation System You Tube Video](#)

Git-hub Repertoire Link: <https://github.com/saurabhpatel18216/music-recommendation-system.git>

Above git-hub link contains the UI code, ontology file in protégé format, dataset of ontology.

Reference:

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