Emotional Reasoning Chat Bot

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Overview

1. Introduction
2. Enrichment
3. Application

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Introduction - Use Case

I feel sad :(make me happy!

Introduction - Use Case

I feel sad :(make me happy!

Watch a happy movie!

Introduction - Data Sources

- *Mining Approach*:
  We mined **imdb** and **metacritic** in order to obtain movies and reviews.
- Result:
  Various metadata plus reviews which reflect the author's emotion.

  Review: Written text conveys emotions much better than a single value attribute.
  BUT: Quality of reviews vary (length, subjective/objective, etc.)!

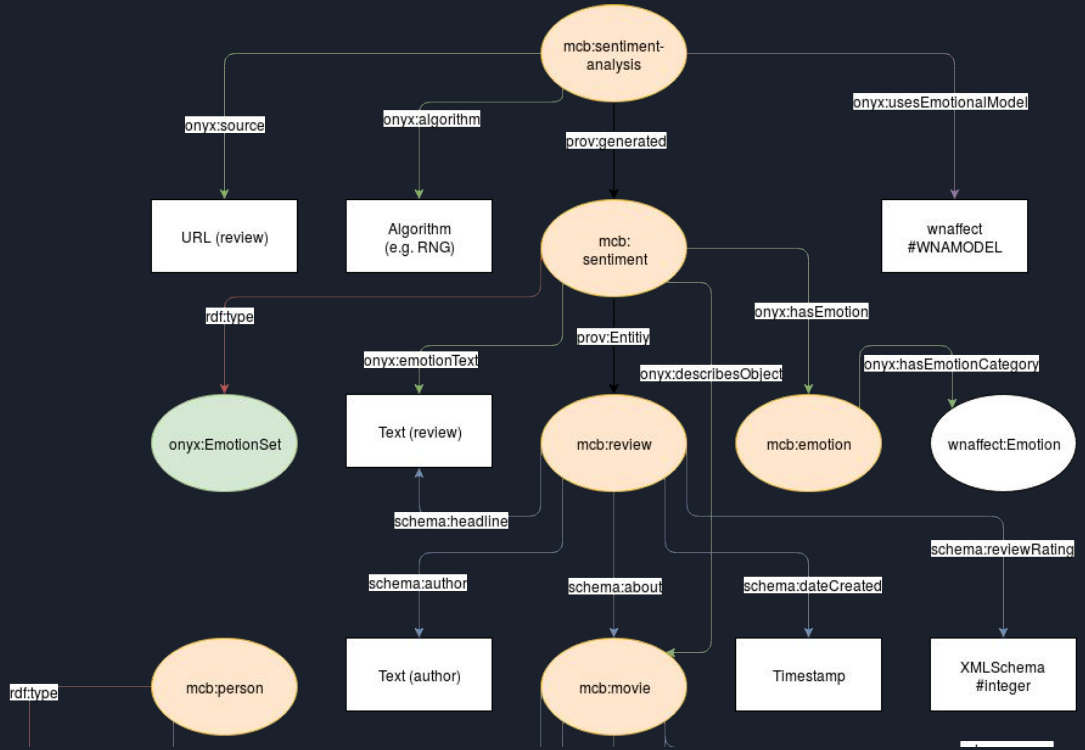
Introduction - Data Sources

- We mined **imdb** and **metacritic** → 2 named graphs.

metacritic.com	metacritic.com	imdb.com	imdb.com	imdb.com
schema:Movie	onyx: EmotionSet	schema: Person	schema:Movie	onyx: EmotionSet
11,681	110,876	565,063	171,536	1,768,320

37,798,497 triples and 3,566,761 individuals.

Introduction - Final Ontology



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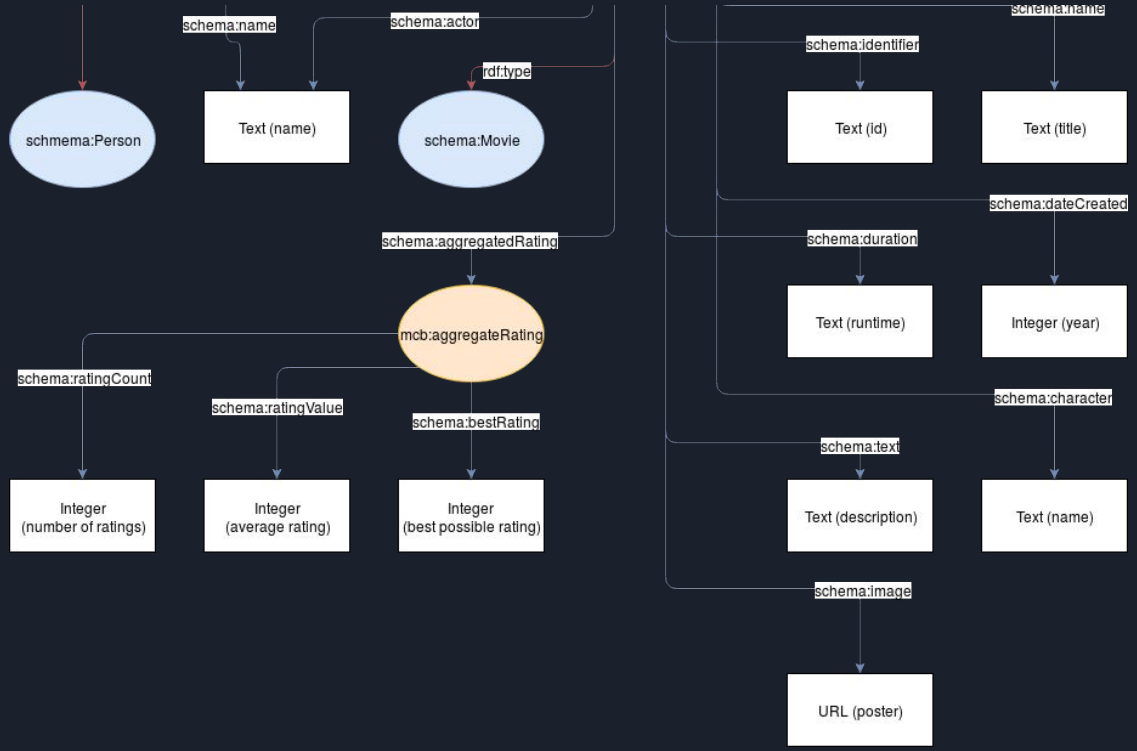

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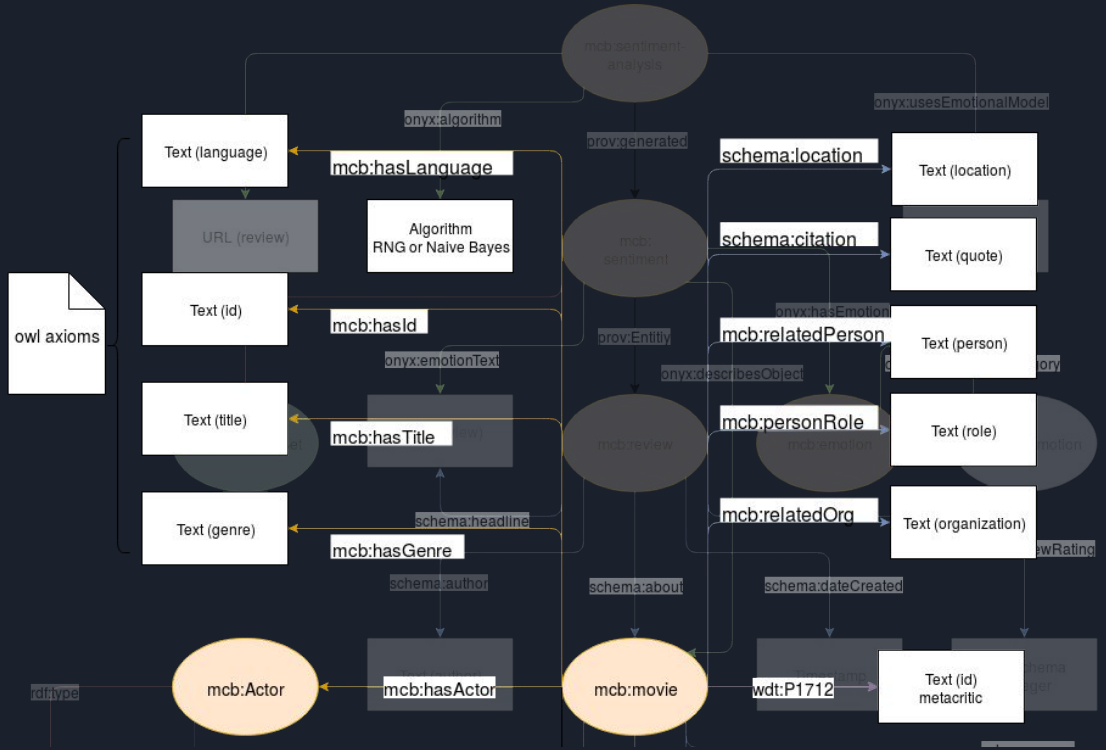

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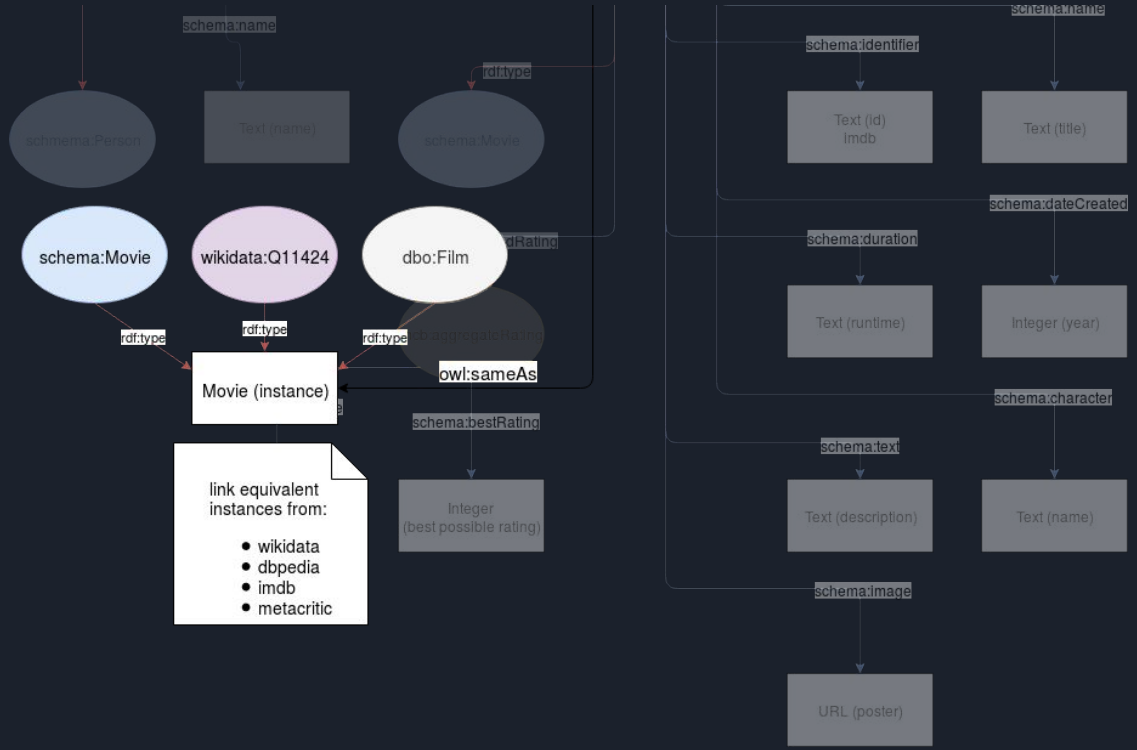

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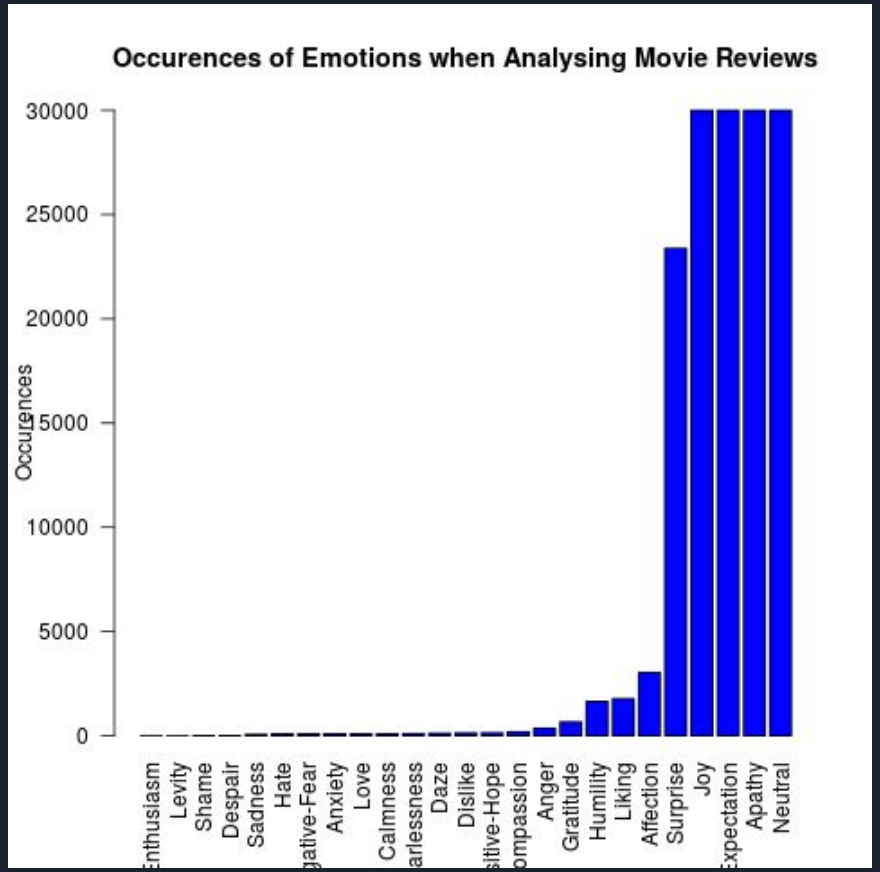
Enrichment - Information Extraction

- *Natural Language Annotation*
  - Ontotext Tagging Service
  - Fully automated process by using the web service
  - Extract:
    - related locations
    - related works
    - related people
    - keyphrases
    - links to the ontotext ontology

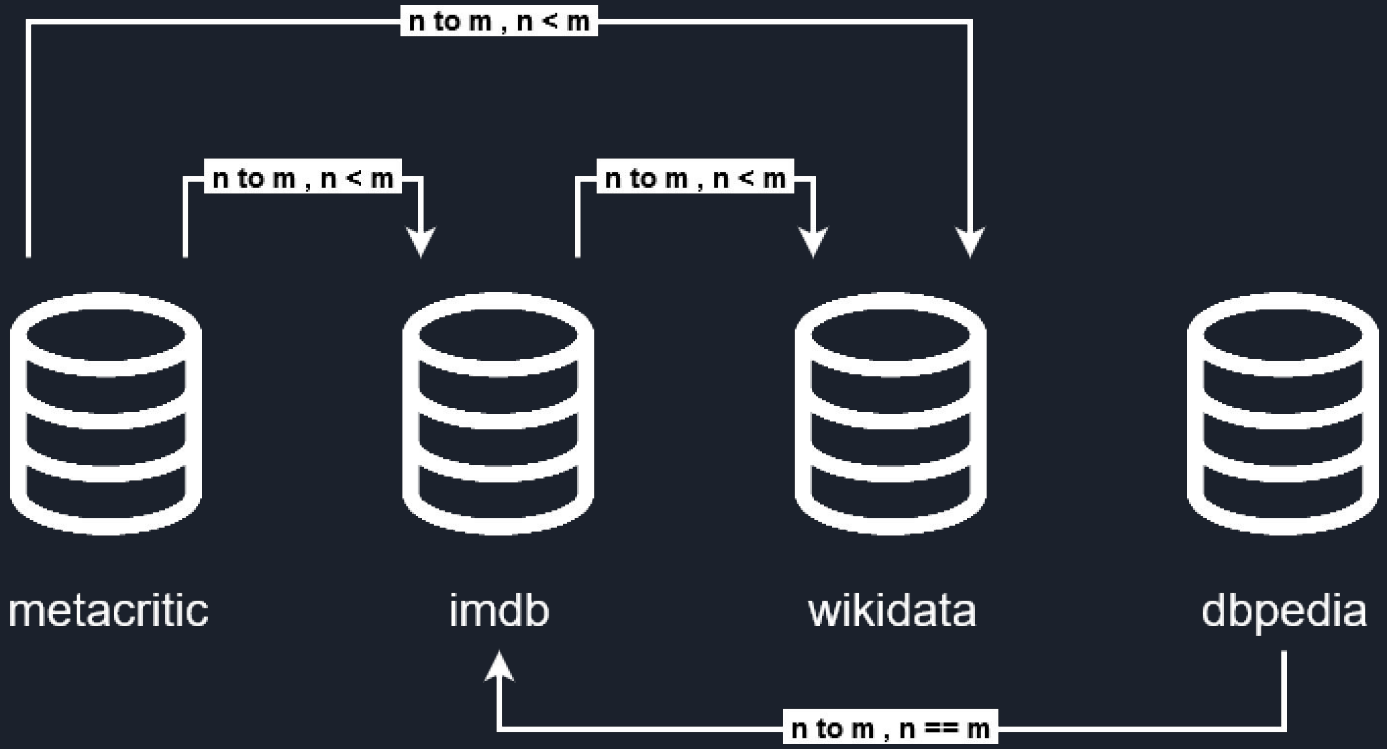
Pulp Fiction may be the single best film ever made, and quite appropriately it is by one of the most creative directors of all time, Quentin Tarantino. This movie is amazing from the beginning definition of pulp to the end credits and boasts one of the best casts ever assembled with the likes of Bruce Willis, Samuel L. Jackson, John Travolta, Uma Thurman, Harvey Keitel, Tim Roth and Christopher Walken. The dialog is surprisingly humorous for this type of film, and I think that's what has made it so successful. Wrongfully denied the many Oscars it was nominated for, Pulp Fiction is by far the best film of the 90s and no Tarantino film has surpassed the quality of this movie (although Kill Bill came close). As far as I'm concerned this is the top film of all-time and definitely deserves a watch if you haven't seen it.

Enrichment - Information Extraction

- *Emotion Extraction*
  - Machine Learning
    - Naive Bayes Classifier
    - Thesaurus for training data
  - Obviously not well distributed
    - Training not good enough
    - Method not perfect
  - Solutions
    - Use training data from social media platforms?
    - Add another method



Enrichment - LOD Links and Alignment



Enrichment - Links For Federated Queries

```
PREFIX schema: <http://schema.org/>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX dbpedia-owl: <http://dbpedia.org/ontology/>

SELECT DISTINCT ?m ?link ?dbm where {
WHERE {
     SERVICE <http://dbpedia.org/sparql> {
          ?dbm a dbpedia-owl:Film .
          ?dbm owl:sameAs ?link
     }
     ?m a schema:Movie .
     ?m owl:sameAs ?link
}
```

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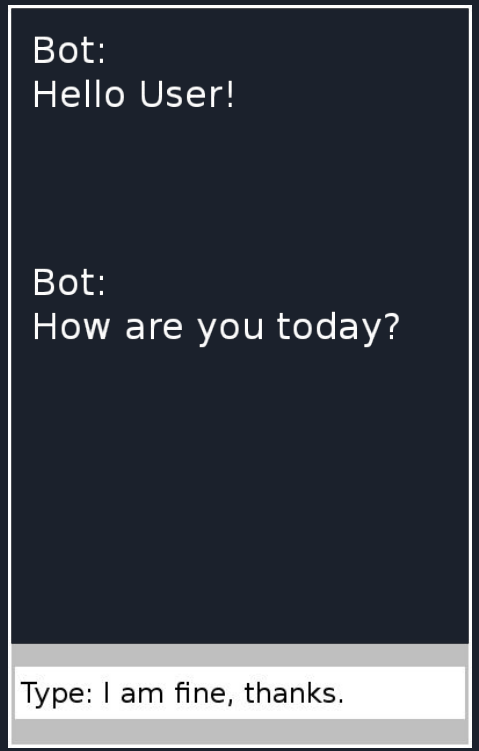
Application - General Description



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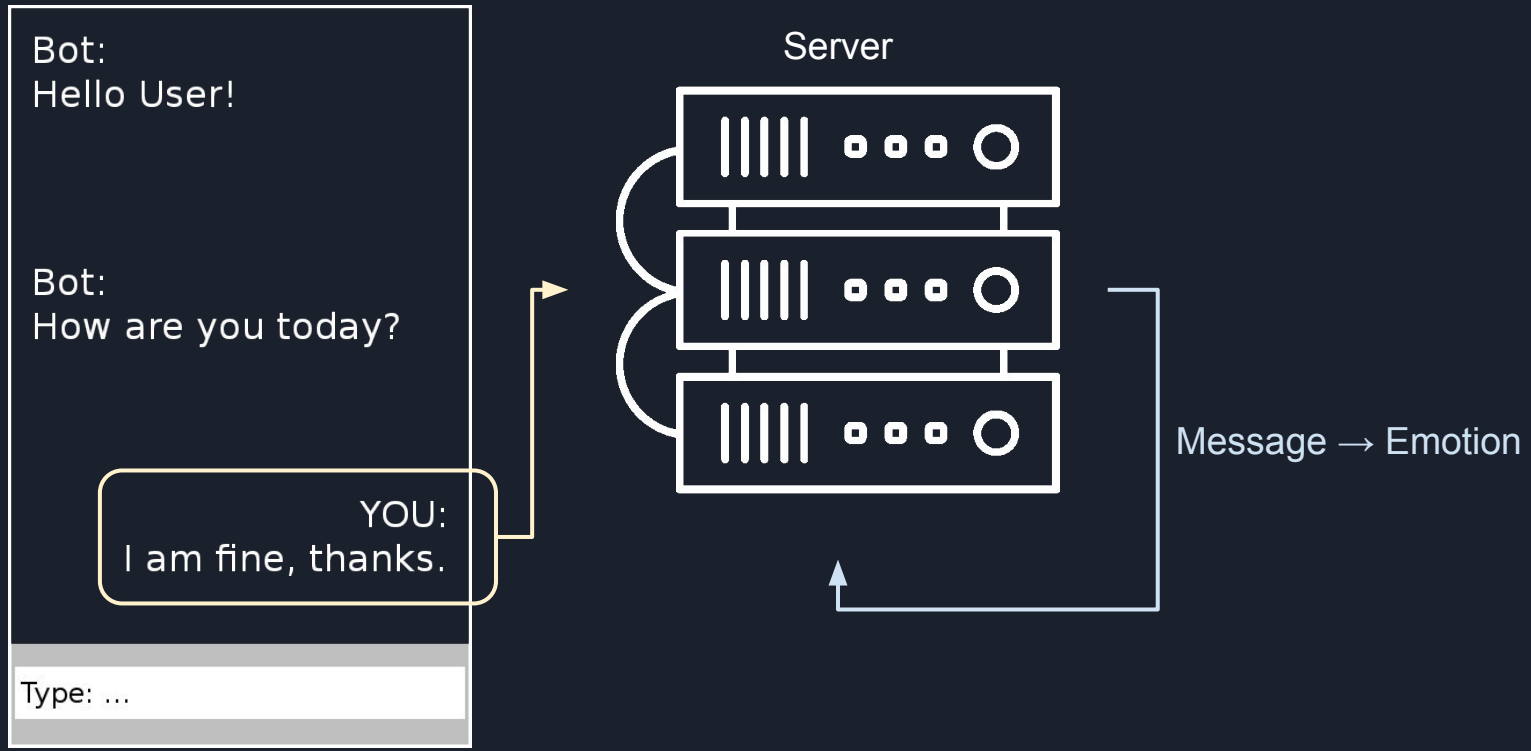

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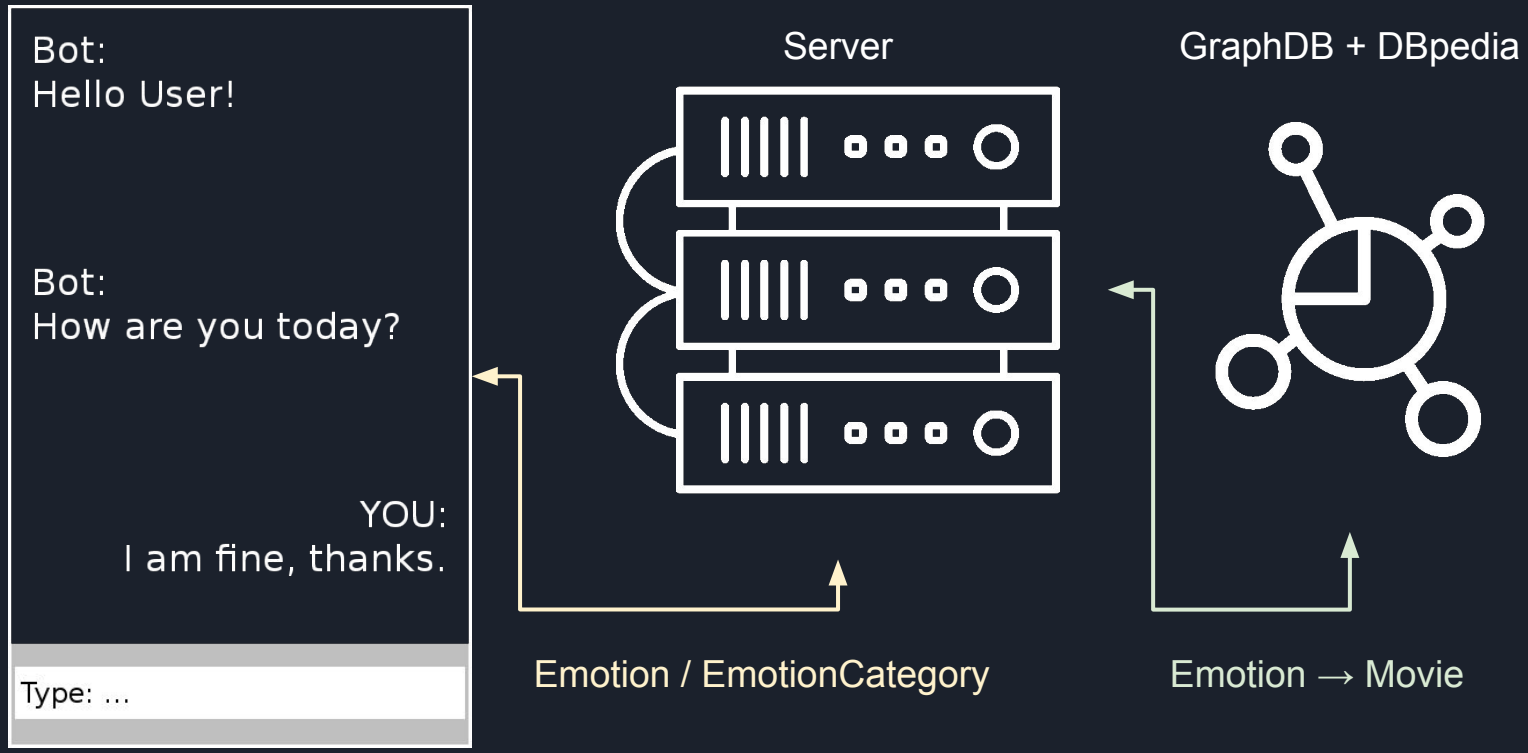

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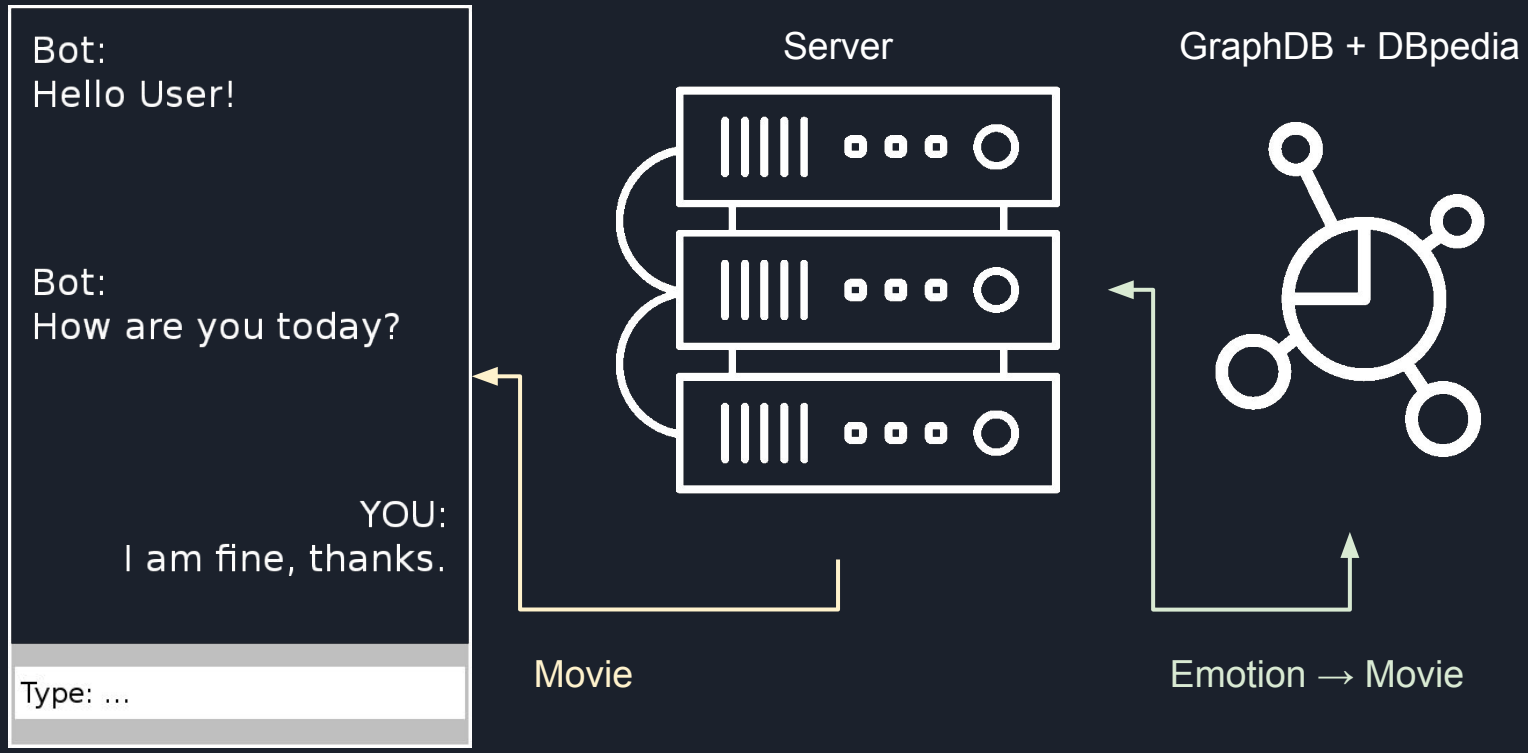

Application - SHACL

SHACL-JS a module for Node.js

- Used by http://shacl.org/playground/
- Fully automated process
  - apply constraints to each .ttl file in specified paths
- https://github.com/TopQuadrant/shacl-js

- Example: At least one genre per movie!

```
[
    a sh:ValidationResult ;
    sh:resultSeverity sh:Warning ;
    sh:sourceConstraintComponent
    sh:MinCountConstraintComponent ;
    sh:sourceShape _:n4343 ;
    sh:focusNode mcb:pulp-fiction ;
    sh:resultPath mcb:hasGenre ;
    sh:resultMessage "A movie should have at least one
    genre!"@en ;
] .
```

Application - SHACL

Shapes for user data:

- UserShape → user has a chatlog and a nickname
  → nickname contains no special characters!
- ChatLogShape → consists of at least one chat part (message)
- PartOfChatShape → has exactly one author, text and timestamp
  → author and text contain no special characters!

Application - Demo

Demo Time!

1. **Data Mining**
2. **SHACL - validation**
3. **Schema.org annotated REST API**
4. **Chat Bot/Movie Recommender**

Icon Credits

Server by Mike Zuidgeest from the Noun Project.

Pie Chart by AB from the Noun Project.