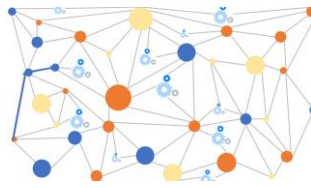




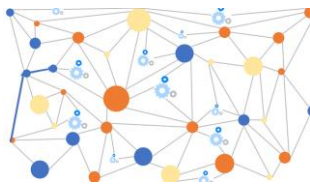
- **Data Engineering**
- Model Training
- Dataset - Mintaka
 - A Complex, Natural, and Multilingual Dataset for End-to-End Question Answering
 - 20000 QA pairs
 - Translated into 8 languages
 - 9 Question complexity types [Count, Comparative, Superlative, Ordinal, Multi-Hop, Intersection, Difference, Yes/No, Generic]



- **Data Preprocessing**
Mintaka dataset – Movies
Splits

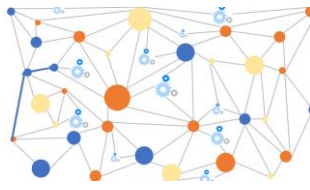
- **Train**
 - **Validation**
 - **Test**
- Structure of Datapoints
- Data Preparation
- Extracting Entities, Predicates and Triples

Dataset \ Category	Movies
Train	700
Validation	107
Test	198



- Data Preprocessing - Mintaka dataset - Movies Splits
 - Train
 - Validation
 - Test
- **Structure of Datapoints**
- Data Preparation
- Extracting Entities, Predicates and Triples

```
{
  "id": "2723bb1b",
  "question": "Which actor was the star of Titanic and was born in Los Angeles, California?",
  "translations": {
    "ar": "مَنْ الممثل الذي لعب دور البطولة في فيلم \"تيتانيك\" وهو من مواليد لوس أنجلوس بكاليفورنيا؟",
    "de": "Welcher Schauspieler war der Star von Titanic und wurde in Los Angeles, Kalifornien, geboren?",
    "ja": "タイタニックのスターで、カリフォルニア州ロサンゼルス生まれの俳優は誰ですか?",
    "hi": "कौन से अभिनेता Titanic के स्टार थे और लॉस एंजेल्स, कैलिफ़ोर्निया में पैदा हुआ थे?",
    "pt": "Qual ator foi a estrela de Titanic e nasceu em Los Angeles, Califórnia?",
    "es": "¿Qué actor protagonizó Titanic y nació en Los Ángeles, California?",
    "it": "Quale attore è stato protagonista in Titanic ed è nato a Los Angeles in California?",
    "fr": "Quel acteur a joué le rôle principal de Titanic et est né à Los Angeles en Californie ?"
  },
  "questionEntity": [
    {
      "name": "Q44578",
      "entityType": "entity",
      "label": "Titanic",
      "mention": "Titanic",
      "span": [
        28,
        35
      ]
    }
  ]
}
```



- Data Preprocessing -
Mintaka dataset – Movies
Splits
 - Train
 - Validation
 - Test
- Structure of Datapoints
- **Data preparation**
- Extracting Entities, Predicates,
and Triples

- Example:

Question: Which actor was the star of **Titanic** and was born in **Los Angeles**, California?

Answer: **Leonardo DiCaprio**

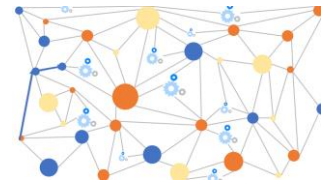
Entities in Question and Answer :

Titanic - Q44578

Los Angeles - Q65

Leonardo DiCaprio - Q38111

DATA ENGINEERING - MINTAKA



- Data Preprocessing Mintaka dataset – Movies Splits
 - Train
 - Validation
 - Test
- Structure of Datapoints
- Data preparation
 - Wikidata Entities
- Extracting Entities, Predicates, and Triples

Item Discussion

Titanic (Q44578)

1997 film directed by James Cameron

▼ In more languages

Configure

Language	Label	Description	Also known as
English	Titanic	1997 film directed by James Cameron	
Vietnamese	Titanic	Phim điện ảnh tình cảm - sử thi - chính kịch của Mỹ năm 1997	
French	Titanic	film de James Cameron, sorti en 1997	

Titanic - Q44578

Item Discussion

Los Angeles (Q65)

largest city in California, United States of America

Los Angeles, California | Pink City | The town of Our Lady the Queen of the Angels of the Little Portion | La L | City of Angels | City of Los Angeles | LA, California | L.A. | LA | Double Dubuque | Los Ángeles | Los Ang

Language	Label	Description
English	Los Angeles	largest city in California, United States of America

Los Angeles - Q65

Item Discussion

Leonardo DiCaprio (Q38111)

American actor and film producer

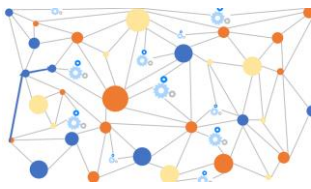
Di Caprio | Leonardo di Caprio | Leo DiCaprio | Leonardo Wilhelm DiCaprio

▼ In more languages

Configure

Language	Label	Description
English	Leonardo DiCaprio	American actor and film producer

Leonardo DiCaprio - Q38111



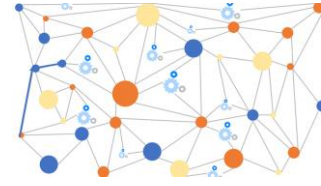
- Data Preprocessing - Mintaka dataset – Movies Splits
 - Train
 - Validation
 - Test
- Structure of Datapoints
- **Data preparation**
 - **Wikidata Entities**
 - **SPARQL Queries**
- Extracting Entities, Predicates and Triples

The screenshot shows the Wikidata Query Service interface. At the top, there's a header with the Wikidata logo and the text "Wikidata Query Service". To the right of the header is a button labeled "Examples". Below the header, there's a text area containing a SPARQL query. The query is as follows:

```
1 # Subject Predicate Object
2 SELECT $s $p $o WHERE
3 {
4 {
5   VALUES ?s { wd:Q51489 wd:Q41421 } .
6   VALUES ?o { wd:Q650613 } .
7   $s $p $o
8 }
9 }
10 ORDER BY DESC(?s)
```

Below the query text area, there's a section labeled "Table" with a dropdown arrow and a help icon. This section contains a table with three columns: "s", "p", and "o". The first row of data shows the following values:

s	p	o
Q wd:Q51489	wdt:P800	Q wd:Q650613



- Data preprocessing -
Mintaka dataset - Movies
Splits
 - Train
 - Validation
 - Test
- Structure of Datapoints
- Data preparation
 - Wikidata Entries
 - SPARQL Queries
- **Extracting Entities, Predicates
and Triples**

- Extract all the entities from Question and Answers from
the trimmed dataset

Example : Q51489 , Q656013

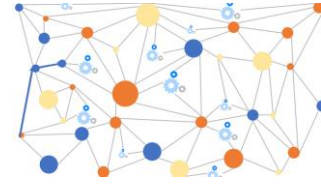
- Extract all the Relations or Predicates between the
Question QID and the Answer QID

Example: P800

- Form the triples as <S , P , O >

Example : < Q51489 , P800 , Q656013 >

DATA ENGINEERING - MINTAKA



- Data preprocessing - Mintaka dataset - Movies Splits
 - Train
 - Validation
 - Test
- Structure of Datapoints
- Data Engineering
 - Wikidata Entries
 - SPARQL Queries
- **Extracting Entities, Predicates and Triples**

No of Entities	10118
No of Triples	28027
No of Predicates	323

Entity table		
Entity	Name	Alias
Q189489	Zendaya	Zendaya Coleman, Zendaya Maree Stoermer Coleman
Q80596	Arthur Miller	Arthur Asher Miller
Q165219	Robert Down	RDJ, Robert Downey, Robert John Downey Jr.
Q23894967	Tony Stark	Iron Man, Anthony Edward Stark
Q172	Toronto	Toronto, Canada, Hogtown, The Six, City of Toronto, Toronto, Ontario, T-O, The 416, Toronto, ON
Q189490	Jennifer Lawr	J Law, Jennifer Shrader Lawrence, JLaw

Property table		
Property	Name	Alias
P106	occupation	work, profession, job, craft, vocation, avocation, career, employ, employment
P199	business division	divisions, has business division, has division
P85	anthem	national anthem, march, team anthem, club anthem, official hymn, official song
P47	shares border with	border, next to, adjacent to, bordered by, borders clockwise
P69	educated at	faculty, education, student of, alma mater, attended, alumna of, alumni of, alumnus of, attended school at,
P57	director	film director, movie director, directed by
P19	place of birth	birth location, birth place, birthplace, location of birth, POB, birth city, born, born at, born in, location born
P135	movement	art movement, artistic movement, school, philosophical movement, literary movement, music scene, artistic school, trend, scientific movement

Triplet table		
Subject	Relation	Object
Q189489	P800	Q27985819
Q188	P17	Q39
Q270599	P162	Q223992
Q30	P530	Q242
Q159846	P355	Q7135302
Q6219699	P3373	Q51506
Q2266587	P179	Q642878