**Chatbot using Knowledge Graph**

**Source Code Details:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Serial No. | File Name | Type of Language | Type of File (or File Extension) | Functionality | Dependency |
| 1 | DSAI\_Knowledge\_Graph.ipynb | Python | .ipynb  Implemented using OOP concepts | Used to creates knowledge graph from DSAI\_KG\_Input\_Data\_Text.csv' and just plots the entire knowledge graph created as well as graph based on relations like 'composed by', 'written by'. | Input: DSAI\_KG\_Input\_Data\_Text.csv |
| 2 | DSAI\_Queries.py | Python | .py | Parses DSAI\_Knowledge\_Base.nt file and prints outputs in the console like 'topics for a given course', 'total number of topics' etc.. | Input: DSAI\_Knowledge\_Base.nt |
| 3 | DSAI\_Knowledge\_Base.py | Python | .py | Generates knowledge graph from DSAI\_Course\_Data, DSAI\_Student\_Data, DSAI\_University\_Data and populates DSAI\_Knowledge\_Base.nt file | Input: DSAI\_Course\_Data, DSAI\_Student\_Data, DSAI\_University\_Data  Output: DSAI\_Knowledge\_Base.nt |
| 4 | DSAI\_Main.py | Python | .py  Implemented using OOP concepts | Used to run Command Line Interface chatbot that inputs from the DSAI\_Knowledge\_Base.nt file. | Input: DSAI\_Knowledge\_Base.nt |

**Run Instructions:**

|  |  |  |  |
| --- | --- | --- | --- |
| Step Number | Run Command | Run Dependency | Run Instruction |
| 1 | Run ‘python DSAI\_Knowledge\_Base.py’ |  | This creates knowledge graph and store as DSAI\_Knowledge\_Base.nt  (Run only once) |
| 2 | Run ‘python DSAI\_Main.py’ |  | This runs Command line interface Chatbot |

**Source Code Steps:**

1. DSAI\_Knowledge\_Graph.ipynb
   1. Import DSAI\_KG\_Input\_Data\_Text.csv (Input Data)
   2. Find entity pairs from the data
   3. Extract subject and object from the entity pairs and create a data frame with subject as ‘source’ and object as ‘target’
   4. Plot the entire knowledge graph obtained from the entire dataset
2. DSAI\_Queries.py

Parses DSAI\_Knowledge\_Base.nt and prints the following query outputs in the console

* + 1. Total number of triples in the knowledge base
    2. Total number of students
    3. Total number of courses
    4. Total number of topics
    5. Topics for the course ‘Income Taxation in Canada’ and their link to dbpedia
    6. All courses completed for the student ‘Dania Kalomiris’
    7. List of all students familiar with the topic ‘Aerospace’
    8. List of all topics ‘Victoria Chikanek’ is familiar with

1. DSAI\_Knowledge\_Base.py
   1. Creates Knowledge base from namespaces in ‘rdflib’ library
   2. Process DSAI\_University\_Data into RDF triples
   3. Process DSAI\_Course\_Data into RDF triples
   4. Process DSAI\_Student\_Data into RDF triples
   5. Serialize the knowledge-based graph into DSAI\_Knowledge\_Base.nt file
2. DSAI\_Main.py
   1. Parse knowledge-based graph from DSAI\_Knowledge\_Base.nt file
   2. Get input from user in the below forms:
      1. Which courses did <student name> take?
      2. Which courses cover <topic name>?
      3. Who is familiar with <subject name>?
      4. Quit – to exit from chatbot
   3. Find and print relevant response for the user input