

Problem Statement

Unified Medical Language system (UMLS) is a rich source of terminologies, classification and coding standards for Medical Language Processing (MLP). SNOMED is one of the designated standards for the electronic exchange of clinical health information, where medical terminologies used in a health information text can be standardized, and connected as ontology, with interoperability across different systems.

Likewise, RxNorm provides normalized names for clinical drugs and vocabularies. The objective is to combine all publicly available data to construct a Question-Answer (QA) system for diseases, symptoms, conditions and drugs used for treatment.

Problem Description

SNOMED CT is a queryable ontology which indexes standardized medical terminologies such as conditions, body parts, symptoms, drugs, procedures, techniques, severity, etc. UMLS provides medical taxonomies in terms of Metathesaurus, lexical tools, and semantic networks.

UMLS allows the data to be loaded to a relational database for querying. RxNorm provides a standardized list of drug names against the syntactic variations. When these taxonomies are combined, a queryable medical knowledge base could be constructed, with which, a Question-Answer system should be constructed.

Combining the taxonomies to a queryable medical knowledge base is one part of the expected solution. The second part of the solution is to create a natural language interface that allows a user to type a query in English to seek an answer from the knowledge base.

Expected Solution

A web interface that accepts a question in natural English language from a user. The QA system should understand the question- with semantics- and use the underlying UMLS/SNOMED/RxNorm knowledge base to find the best answer(s) ranked by relevance or significance.

Tools & Technology

Apache cTAKES is a powerful platform that integrates well with the UMLS for developing software applications for medical language processing.

Resources/References

UMLS: <https://www.nlm.nih.gov/research/umls/index.html>

SNOMED: <https://www.nlm.nih.gov/healthit/snomedct/index.html>

RxNORM:

<https://www.nlm.nih.gov/research/umls/rxnorm/index.html> cTAKES:

<https://ctakes.apache.org/>