

Homework 7

Problem 1. The follow is an excerpt from a case published on the Web (<http://www.wits.ac.za/fac/med/pulmonology/case1.htm>)

“Mrs Z.N. : 35 yr old farmer labourer from the Kwazulu-Natal province. She presented with a one week history of right sided pleuritic chest pain. The onset was sudden. This was associated with a warm flushing feeling and dizziness. There was also a pain in the right upper quadrant of her abdomen. There was no history of shortness of breath, cough or wheezing. There were no cardiac symptoms, no symptoms of malaise or loss of weight. No history of fevers. She was not a smoker and drank no alcohol. Of note is that she admitted to eating the entrails of the goats that she keeps. On examination, the patient was not distressed. She was hemodynamically stable and afebrile. She was not tachypnoeic. She was clinically pale. Examination of her head and neck showed no abnormalities. Her heart was normal. Her chest was tender to percussion and dull in the right base. On auscultation of the right lung, the breath sounds were reduced in the base with a small area of amphoric breathing above the dullness. The examination of the abdomen was normal with no hepatosplenomegaly present. The neurological examination was normal. There were no skin rashes.”

a. Encode the case using UMLS concepts. You need to identify the concepts id (cui) and their semantic types. When a concept belongs to more than more semantic type, pick the more specific category.

See UMLS Knowledge Source Server(<http://umlsks5.nlm.nih.gov>)

Please represent the concepts and their semantic types in the following format:

Term/Concept	Cui	Semantic Type UI
Farmer	C0221460	Professional or Occupational Group
.....		

The list of concepts does not need to be exhaustive; however, you can and should identify at least 25 concepts in the case description.

b. Please pick 3 semantic types present in the case and, for each type, identify 3 or more attributes of concepts/data of each semantic type.

c. Look up the sources of each concept from the UMLS Knowledge Source Server and save the concepts and their corresponding sources in a file. Write a java program to process the file and create a summary report on which sources contain which concepts. Base on your report, which source vocabulary has the broadest coverage?

Problem 2. Read the article on thyroid disease at (http://www.medem.com/medlb/article_detailb.cfm?article_ID=ZZZDMMPX77C&sub_cat=501).

a. Please represent the knowledge in the article using UMLS concepts and semantic relations in the following format:

Knowledge	Concept	Semantic Relation	Concept
The thyroid gland makes, stores, and releases two hormones - T4 (thyroxine) and T3 (triiodothyronine).	Thyroid Gland (C0040132)	Produces	Thyroxine (C0040165)

You only need to give one or two examples of knowledge involving each different semantic relation; a total of 10 examples are expected. Look up and include CUIs of concepts to ensure that they are UMLS concepts.

The definitions of UMLS semantic relations will be emailed to you. The hierarchies for semantic relations in the UMLS semantic network can be found at <http://www.nlm.nih.gov/research/umls/META3.HTML#s34> .

b. Using the semantic relations of as predicates, select and represent 5 sentences in the article in predicate logic. You can define extra predicates, but include at least one UMLS semantic relation based predicate in each WFF. For example:

The thyroid gland makes, stores, and releases two hormones - T4 (thyroxine) and T3 (triiodothyronine).

Define: produces(x,y) = x produces y.

Produces(thyroid gland, thyroxine) and Produces(thyroid gland, triiodothyronine)