Assignment 2: Build your own ontology

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Between 1980 and 2014, the global number of diabetic individuals has increased from 108 million to 422 million (Mathers & Loncar, 2006), indicating that diabetes is the world's fastest-growing disease (Faiz et al.,2014). Diabetes can be controlled, however, with medication, diet, physical activity, regular examinations, and remedies for complications (Mathers & Loncar, 2006). This ontology-based system combines information from different domains—including Disease, Food Items, Nutrients, Person, and Personal Characteristics to understand the relationship between diabetes and other domains. I created a separate OWL ontology for each domain. Individual ontologies can then be added into a combined ontology, which integrates and explains the relationship among objects from different ontologies.

The ontology contains a hierarchy class of Diseases, Food Items, Nutrients, Person, and Personal Characteristics. The Disease class includes a subclass—diabetes—and its two forms: Type 1 and Type 2. Under the Food Item class is a list of subclasses: Fruit, Vegetables, Starch, Meat and Proteins, and Milk and Dairy. These can be used to understand the type of food a person prefers. The Nutrient class is a super class for defining various nutrient categories, including Carbohydrates, Protein, and Fats, and are used to describe a Food Item's nutrients. The Person class includes a person's name and identifies the diabetes type, what foods he or she prefers, and the number of nutrients consumed. The Person Characteristic is a super class involving gender, age, daily activities, and vital signs to describe the person. There are also four objective properties relationships on ontology this a which has_a, is_a, has_Netrual_Measuers, and has_vitalsign which can be used to connect between different classes in the ontology.

Many diseases exist worldwide, including cancer, heart diseases, and cardiac diseases. This ontology, however, only focuses on diabetes and its two subtypes—Type 1 and Type 2. This ontology also offers a person's name and defining attributes, such as gender, age, and daily activities. Moreover, a person's preferred food items are presented and can be categorized with details.

References

Mathers, C. D., & Loncar, D. (2006). Projections of global mortality and burden of disease from 2002 to 2030. *PLoS medicine*, *3*(11), e442..

Faiz, I., Mukhtar, H., & Khan, S. (2014, October). An integrated approach of diet and exercise recommendations for diabetes patients. In e-Health Networking, Applications and Services (Healthcom), 2014 IEEE 16th International Conference on (pp. 537-542). IEEE.