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COMPUTER SCIENCE DEPARTMENT

Computer Science - Curriculum Artificial Intelligence

Project Assignment

Foundamentals of Artificial Intelligence

GraphBrain

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2 Exercise 1

2.1 Overview

This document provides a detailed description of the updates performed. The modifications have been structured into two main sections: firstly, the upload of various entities to specific classes, and secondly, the improvements proposed for the the interface.

2.2 Data Upload Details

- **Metal Slug Series - Main Games**: Approximately 10 main titles from the Metal Slug series *RETROCOMPUTING → VIDEOGAME*
- **Flight Simulator Series**: Around 10 flight simulation games. *RETROCOMPUTING → VIDEOGAME*
- **Street Fighter Series**: Roughly 8 distinct titles. *RETROCOMPUTING → VIDEOGAME*
- **Dragon Ball Games**: About 15 games. *RETROCOMPUTING → VIDEOGAME*
- **Pro Evolution Soccer Series**: Nearly 35 games including both current titles and their historical predecessors. *RETROCOMPUTING → VIDEOGAME*
- **Console Games**: Approximately 5 devices. *RETROCOMPUTING → CONSOLE*
- **Technology Vendors**: Details for 5 companies. *RETROCOMPUTING → COMPANY*
- **Peripheral Devices**: Information for about 15 mouse and keyboard devices. *RETROCOMPUTING → Input Device (Mouse, Keyboard)*
- **EXPO Events**: A list of approximately 35 events. *RETROCOMPUTING → Event*
- **Software Relationships**: For each videogame, a *producedBy* relationship has been established linking the software to the company that developed it.
- **Console Relationships**: For each console, the producing company has been recorded along with associated relationships to already existing consoles.

- **Peripheral Relationships**: For each mouse and keyboard device, the producer has been identified.
- **Geographical Data**: Inclusion of Matera and surrounding cities (approximately 30 locations).
- **Internet Protocols**: Updates include renaming 8 existing protocols and adding around 70 new entries. *RETROCOMPUTING* → *InternetProtocol*
- **Crapiata**: A traditional dish from Matera, described as a soup made with legumes and vegetables, albeit missing some ingredients. *FOOD*
- **Culinary Relationships**: Established relevant relationships associated with the aforementioned dish.

2.3 Interface Improvements

Several adjustments have been made to enhance the user interface:

- Incorporation of an HTML Date Type field for the insertion of dates.
- Modification of the relationship creation process to allow starting from either the Subject or the Object.

3 Exercise 2

Here I will provide a brief overview of the changes made the ontology. The modifications are divided by domains and, for each domain, they are divided into two sections: the first one is about the entities and the second one is about the reletionships

3.1 RETROCOMPUTING

3.1.1 Entities

- **StorageMedium**: I suggest to add a new value for *StorageMedium* called *SolidState*. This value will be used to represent all the solid state storage devices such as SSD, USB pen drive and so on.
- **FPGA**: I suggest to add a new sub-class of *Device* called *FPGA*. This class will be used to represent all the FPGA devices, such as Microchip IGLOO Series

- **Videogame**: Since a videogame can be classified into multiple categories, I suggest to add an attribute to videogame called *Category* that will be a list of categorie such as FPS, Sport, RPG, MOBa and so on. The previously existing sub-classes of *Videogame* have been removed.
- **Preservation Project**: I suggest to add a new class called *Preservation-Project* sub-class of *Artifact*. This class will be used to represent all the preservation projects that are related to retrocomputing for example *Internet Archive* or *MAME*. The new attributes are goal (mandatory) and description
- **Fix**: I suggest to introduce 2 new attributes to *Fix* which are *repairDifficulty* that can assume only 3 values (Beginner, Intermediate, Expert) and *documentationLink* that is a link to the documentation of the fix.

3.1.2 Relationships

- **supports**: I suggest to add this new relationship between *Device* (subject) and *Software* (object). This relationship will be used to represent the software that is supported by a specific device. The attribute is compatibilityNotes
- **compatibleWith**: I suggest to add Software (subject) and Component (object). This relationship will be used to represent the software that is compatible with a specific component.
- **supports**: I suggest to add this new relationship between *Device* / *OperatingSystem* (subject)and *Software* (object). This relationship will be used to represent the software that is supported by a specific device or operating system. The attribute is compatibilityNotes

3.2 FOOD

3.2.1 Entities

- **Beverage**: I suggest to add a new attribute called *Type* to indicate the type of beverage (alcoholic, non-alcoholic, etc.).
- **Menu Item**: I suggest to add a new attribute called *dietaryInfo* to indicate the dietary information of the menu item (vegan, vegetarian, gluten-free, etc.).
- **SensorialFeature**: Sensorial feature has been removed [1]
- **Restaurant**: I suggest to add the attribute *type* to indicate the type of restaurant (fast food, fine dining, etc.).

[1] Sensorial Feature may be described as attributes in a relationships without a specific class.

- **DietaryRestriction**: I suggest to add this new entity to represent the dietary restrictions that can be associated with a food item or menu item. The new attributes are name (mandatory) that can assume fixed values (vegan, vegetarian, gluten-free, etc.)
- **KitchenTool**: I suggest to add this new entity to represent the kitchen tools that can be used in the preparation of food. The new attributes are name (mandatory)

3.2.2 Relationships

- **contains**: I suggest to add this new relationship between *FoodBeverage* (subject) and *Nutrient* (object). This relationship will be used to represent the nutrients that are contained in a specific food or beverage. The attribute is quantity (mandatory) that can assume fixed values (low, medium, high).
- **requires**: The subject has been modified from *Artifact* to *KitchenTool*
- **describes**: New attributes have been added to express SensorialFeature

3.3 OpensScience

I've added the instruction ¡import schema "retrocomputing"¿ to the ontology to import the retrocomputing schema

3.3.1 Entities

- **Dataset**: I suggest to add new attributes: creationDate,license,format
- **Environment**: I suggest to add new attributes: type (whose values are Lab, Field or Virtual) and description
- **Author**: I suggest to add *Author* as a sub-class of *Person*

3.4 General

3.4.1 Entities

- **Material**: I suggest to add a new Category called *Material* to represent the materials that can be used to describe Item.
- **Document**: I suggest to add a new attribute called *ToC* to represent the table of contents of the document.

- **Item**: I suggest to add a new attribute called *conditionNotes* to represent the condition of the item

3.4.2 Relationships

- **madeOf**: I suggest to add this new relationship between *Item* (subject) and *Material* (object)